Remedial Investigation Report

AOI 6
Girard Point Refinery
3144 Passyunk Avenue
Philadelphia Energy Solutions Complex
Philadelphia, Pennsylvania

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1. Introduction

This Remedial Investigation (RI) Report (RIR) has been prepared for Area of Interest (AOI) 6, also known as Girard Point Chemicals Processing Area, at the Philadelphia Energy Solutions Refining and Marketing LLC (PES) Philadelphia Refining Complex (facility). Sunoco Inc. (R&M) (Sunoco) transferred the facility to PES on September 8, 2012. Sunoco retained the remediation liability prior to this date. The remediation liability was transferred to Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) on December 30, 2013. The remediation program is currently being performed under a Buyer Seller Agreement signed by Sunoco, PES, and the Pennsylvania Department of Environmental Protection (PADEP) in September 2012.

Site remediation at the facility is ongoing as part of previously-established programs and the 2012 Buyer Seller Agreement. The facility has operated, and is planning to continue operating, as an oil refinery, marketing terminal, and petrochemical complex.

1.1 Facility Description

The facility is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania. Portions of the facility occupy both the eastern and western Schuylkill River banks. The facility, which is located on industrial property, covers approximately 1,300 acres of land with access restricted by fencing and security measures. The area surrounding the property is characterized by a mixture of residential, commercial, and industrial properties. Current operations at the facility consist of the production of basic petrochemicals for the chemical industry.

AOI 6, also known as the Girard Point Chemicals Processing Area, encompasses approximately 100 acres and is located on the east side of the Schuylkill River. AOI 6 is a wedge-shaped property bordered by Lanier Avenue/AOI 3 to the east, Penrose Avenue (Route 291)/Platt Memorial Bridge/AOI 5 to the south and Pennypacker Avenue/AOI 7 to the north (Figures 1 and 2). The entire western boundary of AOI 6 along the Schuylkill River is bound by a sheet pile wall. The extent of the sheet pile wall (“bulkhead”) is shown on Figure 2.

1.2 Facility Operational History and Current Use

The facility has a long history of petroleum transportation, storage, and processing. The oldest portion of the facility started petroleum related activities in the 1860s, when the Atlantic Refining Company was established as an oil distribution center. In the 1900s, crude oil processing began and full-scale gasoline production was initiated during World War II. In addition to refining crude oil, various chemicals, such as acids and ammonia, were also produced at the facility for a time. The facility has operated continuously as a refining, product distribution, and storage facility. Use of the facility has remained similar following the transfer of ownership to PES.

Historically, AOI 6 consisted of numerous above ground storage tanks (ASTs) containing benzene, toluene, naphtha and other fuel stocks. A sulfuric acid plant was located along the northern boundary of the AOI. A gasoline treating unit, two reformer units, a BDDA (soap) unit, and a thermal hydro-dealkylation unit were also located in this area.

Currently, AOI 6 consists of Udex and cumene units, reformer with associated naphtha hydrotreater, diesel hydrotreater, tankage, boiler house and associated feed water treatment, maintenance buildings, lay-down yards, control rooms, office buildings, the # 2 oil-water separator, remote Laboratory and new Scale House. On October 13, 2017, an updated building survey for AOI 6 was completed. During this survey 16 structures were identified as routinely occupied or potentially occupied. These buildings included: Building 6636, 24 Gate Building 295, Lab/Bottle Washing Building 163, Girard Point Training Building 651, Girard Point Main Office Building 650, Capital Projects Tank Group Trailers, Control Room 739, Trade Shops 178, Carpenter Shop 726, North Tank Field Blockhouse 475, WTP Control Room 745, Control Room 6627, Control Room south of Boiler House #3, Former Locker House associated with former Boiler House #2, and Office near Separator. The characteristics of several of these buildings, refinery lab/bottle washing, Capital project tank group trailers, control room south of Boiler House #3 and former Locker House near former Boiler House #2/Process Building were such that vapor intrusion is not considered a complete pathway as is further discussed in Section 7.1. The building-specific conditions are as follows:

- Refinery Lab/Bottle Washing Building 163 – broken windows visible throughout that allows outdoor air flow
- Capital Projects Tank Group Trailers – elevated trailers with perforated soffit-style skirt that allows outdoor air flow
- Control Room south of Boiler House #3 – elevated without a skirt
- Former Locker House near former Boiler House #2/Process Building – locked and inaccessible, not occupied
- Office near Separator – blast resistant building sitting on ground and fork truck holes at the surface (to facilitate relocation)
- Paint Shop Building 701 – accessible but unoccupied
- Insulation Building 265 – unoccupied building used for storage

There are two leaded tank bottom SWMUs (SWMU Nos. 92 and 95) located in AOI 6 (Figure 2) that were addressed in several previous Resource Conservation and Recovery Act (RCRA) investigations as part of the United States Environmental Protection Agency (USEPA) Corrective Action process and during the Act 2 site characterization activities.

The 27 Pump House Total Fluids Recovery System was installed in November 2001, the system included 12 total fluid recovery wells in the vicinity of the former 27 Pump House. The 27 Pump House Total Fluids Recovery system was turned off September 20, 2010 due to absence of recoverable LNAPL. Passive remediation began on October 10, 2010 with the installation of absorbent socks in wells B-124, B-132, B-137, B-139, B-142, B-143, and B-147. Based on limited recoverable LNAPL in the proximal wells, passive remediation was discontinued on January 26, 2015. Groundwater gauging of select monitoring wells in AOI 6 occurs on an annual basis during the second quarter of each year by Stantec Consulting Corporation (Stantec). Annual gauging activities and results are reported to the PADEP and EPA in Quarterly Reports prepared by Evergreen.

1.3 Regulatory History/Overview

Sunoco and the PADEP entered into a Consent Order & Agreement (CO&A) in December 2003 with respect to the facility. Sunoco's Phase I Remedial Plan (Phase I Plan), dated November 2003, was included as an attachment to the CO&A. In accordance with the CO&A and Phase I Plan, a Current Conditions Report and Comprehensive Remedial Plan (CCR) was prepared by Sunoco in June 2004. The Phase I Plan and the CCR divided the facility into 11 AOIs, and presented a prioritization of the AOIs based on specific risk factors. The CCR also presented the Phase II remedial approach and schedule to characterize each of the 11 AOIs, and to conduct Phase I and II corrective action activities in accordance with the 2003 CO&A and the Phase I Plan. Since 2003, Sunoco has performed site characterization activities at all 11 AOIs in accordance with the 2003 CO&A. Sunoco has prepared and submitted a corresponding Site Characterization Report (SCR) for each AOI in accordance with the Revised Phase II Corrective Action Activities schedule that was included in the CCR.

In October 2006, Sunoco submitted a notice of intent to remediate (NIR) to the PADEP for the facility, entering the facility into the Act 2 program. This NIR was later updated and submitted to the PADEP in November 2014 in order to revise the ownership identity to PES and the remediator identity to Evergreen. In November 2011, the facility was formally entered into the PA One Cleanup Program with the USEPA Region III and PADEP. In November 2011, Sunoco submitted a revised Work Plan for Sitewide Approach under the One Cleanup Program (Work Plan for Sitewide Approach). As previously discussed, characterization and remediation work at the facility is currently being performed under the September 2012 Buyer Seller Agreement signed by Sunoco, PES, and the PADEP.

The following provides a timeline of major events and submissions for the facility and AOI 6:

2004

- The PADEP and USEPA signed an agreement entitled "One Cleanup Program Memorandum of Agreement (MOA or One-Cleanup Program)," which clarifies how sites remediated under Pennsylvania's Voluntary Cleanup Program may satisfy RCRA corrective action requirements through characterization and attainment of remediation standards established under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2).
- Langan prepared the CCR for the Philadelphia Refinery and the Sunoco Logistics Belmont Terminal.

2005

- PADEP, USEPA, and Sunoco agreed that the One Cleanup Program would benefit the project by merging the remediation obligations under the various programs into one streamlined approach which would be conducted under the existing 2003 CO&A.

2006

- Sunoco submitted an NIR to the PADEP for the Philadelphia Refinery thereby entering the facility into the Act 2 program.

- A Site Characterization Work Plan (Work Plan) for AOI 6 was submitted in February 2006 to the PADEP and the Environmental Protection Agency (EPA). This Work Plan summarized proposed activities to be completed to characterize AOI 6 in accordance with the objectives of the 2004 CCR.
- The Work Plan was implemented between March and June 2006 and the results were summarized in the Site Characterization Report that was submitted to PADEP and EPA in September 2006.

2011

- On November 8, 2011, the USEPA provided an acknowledgment letter to Sunoco formally accepting the Sunoco Facility into the One Cleanup Program.
- Sunoco submitted the Work Plan for Site Wide Approach to document the site-wide remedial approach extending beyond the requirements of the 2003 CO&A. The PADEP and USEPA reviewed and provided input to this report. Sunoco submitted a letter of commitment stating the facility would be remediated according to the Work Plan for Site Wide Approach.

2012

- Sunoco transferred the facility to PES.
- Sunoco, PES, and PADEP signed the Buyer-Seller Agreement that established the environmental remediation and management obligations of Sunoco and PES following the sale of the facility.

2013

- The legacy remediation liability for environmental impacts existing prior to the conveyance of the facility to PES was transferred from Sunoco to Evergreen.
- Sunoco prepared and submitted a SCR/RIR in September 2013 to formerly satisfy the requirements Act 2. This SCR/RIR describe site characterization work included in the 2006 AOI 6 SCR, as well site characterization work completed in 2012 to supplement the 2006 work.
- The PADEP provided Evergreen comments on the 2013 SCR/RIR.

2014

- Evergreen submitted an updated NIR to the PADEP for the facility.

2015

- Langan, on behalf of Evergreen, submitted a Human Health Risk Assessment (HHRA) Report to establish a site-specific standard (SSS) for lead in soil at the facility, the Sunoco Logistics Belmont Terminal, and the Sunoco Partners Marcus Hook Industrial Complex (Langan, 2015).
- The HHRA was approved by the PADEP in a letter dated May 6, 2015 establishing a SSS of 2,240 milligrams per kilogram (mg/kg) for lead in soil.

On February 19, 2016 the PADEP, Evergreen, Aquaterra and GHD met to discuss the Work Plan. The PADEP provided comments to the Work Plan via email on February 25, 2016. In accordance with the Work Plan for Site Wide Approach, Evergreen is submitting this RIR for AOI 6 to formally

satisfy the requirements of Act 2 as specified in 25 PA Code §250.408. This RIR describes site characterization work conducted following the last submittal (2013 SCR/RIR). Activities that have been performed in order to complete characterization as required by an RIR under Act 2 include:

- Additional characterization of surface soil (0 to 2 feet below ground surface [ft. bgs] interval) and subsurface soil (2 to 15 ft. bgs) including targeted soil investigations in potential contaminant source areas, such as historic product handling and storage locations, open storage tank incident areas, and known product releases.
- Horizontal and vertical delineation of impacts in soils.
- Additional soil sampling in areas with light non-aqueous phase liquid (LNAPL).
- Additional groundwater sampling from monitoring wells not containing light non-aqueous phase liquid LNAPL.
- Collection of groundwater samples beneath LNAPL samples.
- Delineation of LNAPL.
- Evaluation of LNAPL mobility.
- Investigation of the potential vapor intrusion to indoor air pathway at occupied buildings.
- Collection of air samples above LNAPL plumes.
- Qualitative evaluation of contaminant fate and transport.

As discussed with the PADEP, Stantec, and Evergreen during a meeting conducted in September 2015, Evergreen is in the process of developing a site-wide MODFLOW model to perform quantitative fate and transport modeling. Evergreen also intends to submit a site-wide human health risk assessment report. Following the approval of these site-wide reports and other RIRs, Evergreen intends to submit a site-wide Cleanup Plan, pursuant to 25 PA Code §250.410, which will present remedies chosen to allow attainment of the selected remediation standards in soil and groundwater.

In accordance with Act 2, the required public and municipal notices for this report have been prepared and issued. Appendix A includes a copy of the original facility NIR, the updated facility NIR, as well as the report notices and their proof of receipt/publication.

1.4 Selection of Constituents of Concern

A list of the constituents of concern (COCs) in soil and groundwater for AOI 6 is included as Table 1. This list is an updated listing of the compounds identified in the Work Plan as the COCs for the facility under Pennsylvania One Cleanup Program and will be referred to as the petroleum short list. This list includes all current constituents from the Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E of PADEP's Closure Requirements for Underground Storage Tank Systems, with the exception of the waste oil parameters. In May 2009, two additional COCs, 1,2,4- trimethylbenzene (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs based on the PADEP's revisions to the petroleum short list of compounds and at the request of the PADEP. The COC listing for groundwater was also revised in 2012 to follow the soil COC listing. The additional

compounds added to the groundwater COC list included anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(a)pyrene, and benzo(b)fluoranthene.

No additional compounds were added to Evergreen short list during the 2016 sampling events, but pH was added to the analyses for samples collected in the vicinity of a former tank (Tank 81).

1.5 Selection of Applicable Standards and Screening Levels

The media of concern for AOI 6 include soil and groundwater. The potential vapor intrusion into indoor air exposure pathway was also evaluated through the collection of the indoor air samples. The approach for attaining Act 2 remediation standards for the media of concern is described below by media. As the current and anticipated future use of the facility is industrial, standards for non-residential properties were selected for comparison.

1.5.1 Soil

All soil results were screened using a multi-step process, as described in this section. Soil results were first screened against the PADEP non-residential, used aquifer (total dissolved solids [TDS] <2,500 micrograms per liter [µg/L]) medium specific concentrations (MSCs) developed by the PADEP to implement the Statewide Health Standard (SHS). The following process was used to select the soil SHS for each COC:

- The highest value of either 100 times the groundwater MSC or the generic value MSC was selected to represent the soil to groundwater numeric value.
- The selected used aquifer, non-residential soil to groundwater (NRSGW) numeric value was then compared with the non-residential direct contact value (NRDC) (0 to 2 feet or 2 to 15 ft. bgs, as applicable).
- The more stringent of the soil to groundwater value and the direct contact value was selected as the soil MSC, otherwise referred to as the SHS, for initial comparison of soil sample results.

The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this report. In order to further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step is to compare all of the soil analytical results to the non-residential direct contact MSCs. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

An exception to this soil screening process exists for lead. On February 24, 2015, Evergreen submitted a Human Health Risk Assessment Report to PADEP which presented the development of a risk-based site-specific standard (SSS) for lead in soil. In a letter dated May 6, 2015, PADEP approved the report, and a non-residential direct contact site-specific numerical standard for lead of 2,240 mg/kg was established. This SSS is used in place of the default 0 to 2 ft. bgs direct contact standard for lead.

1.5.2 Groundwater

Groundwater sample analytical results were screened against the PADEP MSCs for non-residential properties overlying used aquifers with TDS less than or equal to 2,500 μg/L (SHS). Where constituent concentrations are above the SHS, Evergreen evaluated application of the site-specific remediation standard using the pathway elimination option.

1.5.3 Potential Vapor Intrusion into Indoor Air

Indoor and ambient air sample results collected in AOI 6 were screened against the USEPA Region 3 Regional Screening Levels (RSLs) for Industrial Air Target Risk (TR)=1E-6, Target Hazard Quotient (HQ)=0.1 (updated November 2015); the PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (November 2016); and the Occupational Safety and Health Association (OSHA) Permissible Exposure Limits (PELs). The National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLVs) were used for compounds without established OSHA PELs. In accordance with the PADEP Vapor Guidance, since indoor air is the only potential exposure pathway, the results were also screened against the USEPA Region 3 Regional Screening Levels (RSLs) for Industrial Air based on the lower of the Target Risk (TR)=1E-5 and HQ = 0.1 and the PADEP SHS Indoor Air values divided by a factor of 10. These values were used as the threshold to indicate whether additional controls will be necessary to address vapor intrusion. Any such controls will be presented in the Cleanup Plan.

2. Environmental Setting

This section summarizes the geologic framework and general hydrogeologic properties of sedimentary deposits and bedrock underlying the south Philadelphia area, with emphasis near the facility. A brief discussion of historical and present-day topography and hydrology is also included. This section provides a regional context from which sedimentary deposits observed beneath AOI 6 are classified and characterized for the purposes of this RIR. Much of the information presented in this section was summarized during conceptualization of a site geologic model that is being used in the development of a numerical groundwater flow model by Stantec as presented in the AOI 1 RIR (Stantec, 2016).

In general, the groundwater resources and stratigraphic framework of the facility area have been well-documented through a variety of data sources, including previous groundwater resource investigations dating back to the early 1900s, state and federal geologic mapping projects, groundwater modeling studies, and consultant site characterization and remedial investigation reports. Those data sources are summarized herein. In large part, available well and test boring logs from previous on-site and local subsurface investigations were the most valuable resource in evaluating the local subsurface stratigraphy. As such, subsurface information from approximately 750 well and test boring logs was considered in the evaluation of regional conditions. A database of stratigraphic "picks" on interpreted vertical lithologic unit boundaries (and, where possible, geologic formations) was also developed and includes all identified records of boreholes completed to bedrock at and near the facility. The purpose of the "picks" database was to archive interpretation of

individual borehole lithologies to bedrock, so that stratigraphic profiles could be developed for this RIR and the Schreffler lithologic model (Schreffler, 2001) could be refined and updated for site-specific use at the facility (Stantec, 2016). One stratigraphic profile was developed for use in this RIR and is presented herein to support evaluation of the lithologic character, geographic extent, and thickness of each geologic unit identified. A structure contour map of the bedrock surface was also developed and used to support the discussion presented below.

2.1 Hydrology and Topography

The facility occupies a large area adjacent to the Schuylkill River near its confluence with the Delaware River. This region has a long history of human influence and disturbance, dating back to the early 17th Century when European settlers first arrived. The following sections present a brief discussion of the significant land surface morphologic changes that are apparent when comparing modern environments and topography to that shown on historical maps.

2.1.1 Historical Topography and Natural Depositional Environments

The City of Philadelphia Archives and several online archival resources have catalogued and provide free access to copies of many historical maps of Philadelphia. Based on a review of many of those maps, much of the land area occupied by the present-day Philadelphia Refinery was formerly tidal marsh and lowlands that once fringed the Schuylkill River. Figure 3 presents a geo-referenced United States Geological Survey (USGS) topographic map from 1898 (20-foot contour interval). The map indicates that several small tributary streams, digitized on-screen and shown as blue lines, formerly dissected that marshland and presumably would have exchanged water with the tidal Schuylkill River on a semi-diurnal basis. Several islands were also present throughout the lowlands, most notably League Island, which are interpreted as erosional remnants of uplands that formed sometime after deposition of the Trenton "gravel" sediments (discussed in detail below).

At that time, relatively higher topography was apparent north and west of the Schuylkill River, near Gibson's Point. South and east of that general area, the Schuylkill River coursed through a distinctive meander around Point Breeze, and appeared to have formed an erosive cut bank along present-day AOI 2 where higher elevations were present (and favoring point bar deposition north of AOI 10). A southwest/northeast trending ridge of higher elevation was also present south of Point Breeze near AOI 4 (see 20-foot contour on Figure 3), and between those two areas of higher elevation a stream was mapped to have been present. That stream appears to have originated in southern AOI 1 and flowed southwest through AOIs 3 and 7, towards its confluence with the Schuylkill River. Numerous other small streams and ditches draining the lowlands surrounding Hollander Creek were also noted. Additional historic maps indicate that by 1900, an earthen dike had been constructed along the banks of the lower Schuylkill River, and sluices were present at each stream/ditch confluence. Other maps show wooden pilings in places along the Schuylkill River. In general, the construction of containment dikes, sluices, and shoreline hardening would have altered the natural tidal exchange between the Schuylkill River and these historic creeks, thereby limiting the natural accretion of sediment in the marshes that once fringed the river. Moreover, the modifications indicated on these maps would have altered the pre-existing tidal regime and dynamic equilibrium of the Schuylkill River.

2.1.2 Post-Industrialization

Figure 3 indicates that by 1898, storage of petroleum near Point Breeze and Gibson Point had already begun. According to archived records, much of the remaining tidal marsh and lowland environments nearby were reclaimed and routinely dewatered for farming practices around this same time period (mostly on the west side of the Schuylkill River). Industrialization warranted further land filling activity and shoreline hardening, including bulk-heading and filling of the tributary streams that modified and generally raised the antecedent topography into its present-day configuration. Farms were displaced in favor of industrial and commercial land uses. Although some clusters of residential property and open space exist or have existed near the facility, most land in south Philadelphia is presently and has been used for industrial and commercial purposes for over 100 years (IST, 1998).

Light Detection and Ranging (LiDAR) data obtained from the USGS (USGS, 2010) and topographic contours published in 2007 by the City of Philadelphia indicate that present-day topography is relatively flat in the study area, and land surface elevations generally range from a few feet below sea-level near Mingo Creek to approximately 30 feet above sea level near the eastern boundary of the Philadelphia Refinery in AOIs 1 and 8 (referenced to the North American Vertical Datum of 1988 [NAVD 88]) (Figure 4). Although subtle, the high-resolution LiDAR model displays topographically low areas that based on location, likely correlate to the locations of former stream valleys (e.g., Franklin Delano Roosevelt Park). In addition to raising the land surface, much of the filled areas were either paved and/or rendered relatively impervious (Figure 5), which decreased rates of recharge to the water table and necessitated the construction of numerous sewers to convey stormwater runoff (and also sewage) to the Schuylkill and Delaware Rivers.

2.2 Regional Geology and Hydrogeologic Conditions

The facility occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line," where crystalline bedrock of the Appalachian foothills intersects the ground surface (outcrops) (Figure 6). The Atlantic Coastal Plain is a physiographic province that is defined as having relatively flat topography and as being underlain by a characteristic wedge of unconsolidated sediments that thicken in a southeasterly direction, away from sediment source areas in the Appalachian Mountains. These sediments were deposited atop a sloping bedrock surface in complex fluvial, estuarine, and marginal marine environments along the passive Atlantic margin. Overall, subsidence of the Piedmont land surface in conjunction with cyclical sea-level fluctuations have been the primary controlling mechanisms driving periods of deposition, non-deposition and erosion in the Atlantic Coastal Plain (Trapp, 1992). In general, the resulting sedimentary record in the vicinity of the Philadelphia Refinery is complex, largely incomplete, and under-represented by only Cretaceous and Quaternary deposits, separated by a regional disconformity (Stantec, 2012). A summary of those deposits is presented below.

2.2.1 Coastal Plain Deposits

2.2.1.1 Anthropogenic Fill

For reasons discussed, much of the facility and surrounding area is underlain by historical fill material, which was placed for the purpose of reclaiming lowlands along the banks of the tidal

Delaware and Schuylkill Rivers during industrialization. These fill materials are heterogeneous in nature and have been described on borehole logs by others as a mixture of compacted soil and anthropogenic debris, including sand, clay, silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer where antecedent topography was highest to greater than 50 feet where it was used as railroad ballast just east of the Philadelphia Refinery. Within the locations of former stream valleys and marshes (Figure 3), the historical fill material is generally 20 feet or greater in thickness.

The fill materials may contain isolated lenses of groundwater (perched groundwater) where coarse or granular materials are separated from the underlying water table by low permeability sediments. The fill may also be saturated and/or in hydraulic connection with the water table along the axes of former stream channels, where the water-table appears to intersect the fill, or where the fill was placed on marshland. However, at most locations across the Philadelphia Refinery, the fill layer occurs above the regional water-table under average head conditions.

2.2.1.2 Quaternary Deposits

Quaternary sedimentary deposits are present beneath the Philadelphia Refinery and are generally representative of geologically-recent cycles of deposition and erosion that occurred within the last 200,000 years. These cycles of sedimentation were the result of a series of glacial and interglacial periods, namely the Illinoian and Wisconsin glaciations, separated by an intervening interglacial period and followed by the present interglacial period through the Holocene (Sevon et al., 1999). Depositional environments through this Period were primarily controlled by sea-level and the successive down-cutting and infilling of ancestral river valleys, primarily that of the Schuylkill and Delaware Rivers (Owens and Minard, 1979). Details of the Quaternary deposits present at the Philadelphia Refinery are described below.

2.2.1.2.1 Recent (Holocene) Alluvium

Predominantly gray, muddy deposits with occasional sandy, gravelly, and organic-rich lenses comprise the most-recent alluvium present at the Philadelphia Refinery. These sediments were deposited in dynamic floodplain, channel, and marsh environments through the Holocene. As noted, the upper surface of alluvium, in most places covered by fill, defines the antecedent topography that pre-dated development of the Philadelphia Refinery area. This geologic unit is generally present below an elevation of approximately 20 feet NAVD 88. The alluvium ranges in thickness from a few feet at higher elevations, away from the present Schuylkill and Delaware River estuaries, to approximately 15 feet within the former floodplains of buried tributary streams. However, adjacent to and fringing these major river estuaries, apparent marsh deposits accreted in freshwater environments to as much as 60 feet thick (to elevations as low as approximately -60 feet NAVD 88) as sea-level transgressed and flooded the incised river valleys through the Holocene. Figure 3 provides some estimation of how extensive the tidal marshes once were prior to development, generally along the Schuylkill River south of and surrounding Point Breeze. A stratigraphic profile location map is presented on Figure 7. Stratigraphic profile E-E' supports this interpretation and distribution of the most recent alluvial deposits across the Philadelphia Refinery (Figure 8).

Similar to the fill described above, most recent alluvium at the facility has limited water-bearing capacity due to its fine-grained texture. However, heterogeneities within the alluvium may allow for

the presence of localized seasonal perched groundwater resulting from the percolation of recharge water. Within former marsh areas along the Schuylkill and Delaware River estuaries, the regional water-table occurs within the Holocene alluvium. At locations distal to the rivers and where the Schuylkill River appears to have eroded older alluvial deposits (e.g., along the western periphery of AOI 2), the Holocene alluvium occurs above the regional water-table and is unsaturated.

2.2.1.2.2 Pleistocene Alluvium ("Trenton Gravel")

Geologically-recent glacial outwash deposits, commonly referred to informally as the Trenton "gravel", have long been recognized in the vicinity of southeastern Pennsylvania along the Delaware River valley. Sevon and Braun (2000) provide a comprehensive map of glacial deposits in Pennsylvania, including the presence of sand and gravel outwash, interpreted as stratified drift, along the present Delaware River. Owens and Minard (1979) published a comprehensive summary of previous research into these deposits and subdivided the "Trenton gravel" into two distinct deposits (the Spring Lake and Van Sciver Lake beds) based on topographical position and lithology at those type sections. Low et al. (2002) indicate that in most places the Trenton gravel rests directly atop Cretaceous sediments and is overlain by younger alluvium of Holocene age near the Schuylkill River.

Based on literature review presented in the AOI 1 RIR (Stantec, 2016), the Trenton gravel was interpreted as a heterogeneous, stratified alluvial deposit of primarily sand and gravel, with occasional beds of clay and silt (the Van Sciver Lake beds), that resulted from glacial outwash through the Delaware River valley sometime after the Illinoian glacier receded. At the Philadelphia Refinery, the Trenton gravel is commonly described on boring logs as a brown, reddish-brown or, where stained, black, fine to coarse sand with lenses of gravel. The gravel fraction is often multicolored and comprised of a mixture of sub-angular to sub-rounded, sedimentary and metamorphic rocks derived from the Appalachian Piedmont. The Trenton gravel generally ranges in thickness from a few feet up to approximately 30 feet near the Philadelphia Refinery. It appears to be laterally continuous and its thickness depends on the antecedent Cretaceous topography that it filled and on the degree of erosion from above (Stantec, 2016). Along the Schuylkill River at the George C. Platt and Penrose Avenue bridges, and in places beneath the Delaware River, Greenman et al. (1961) mapped the Trenton gravel to be present beneath thick sections of Holocene alluvium to elevations near -60 feet NAVD 88, and those interpretations are shown on Figure 8.

The regional water-table at the Philadelphia Refinery most often occurs within the Trenton gravel, and, as a result of its stratigraphic position, this geologic unit forms the bulk of the unconfined aquifer (along with localized areas of saturated alluvium and fill). Published well records indicate that the Trenton gravel can be a prolific aquifer (Paulachok, 1991). Nevertheless, due to lateral changes in Trenton gravel thickness and to its heterogeneous character, hydraulic properties and groundwater yields can vary widely. Stantec reviewed published data and available on-site aquifer testing data regarding the hydraulic properties of the Trenton gravel and presented those data in the AOI 1 RIR (Stantec, 2016) which are included on Figures 9 and 10 in this report.

A nearly 7-day groundwater extraction test was conducted at recovery well RW-2 at the Philadelphia Refinery (IST, 1998). During testing, RW-2 was pumped at a constant rate of 225 gallons per minute (gpm). Distance-drawdown data analyzed along transects of observation

wells suggested that the area of influence extended approximately 1,680 feet from the pumping well under relatively isotropic conditions. The hydraulic conductivity (k) was estimated to be greater than 400 feet per day (ft/d). More recently, a 24-hour pumping test was conducted at the former DSCP property at monitoring well DSCP-MW-65, a well that appears to be screened across the Trenton gravel and underlying sandy Cretaceous deposits (ARCADIS, 2013). Analysis of that data provided in the referenced report supports comparable aquifer properties at that site. However, it is noted that during the test, the Trenton gravel was dewatered and individual aquifer k values could not be calculated/resolved. Other, in-situ, single well instantaneous displacement tests and short-duration pumping tests for remedial system design suggest a much lower k for the Trenton gravel, on average, but test results vary widely, from less than 1 ft/d to over 600 ft/d. The observed wide range in k values over relatively short distances is consistent with this geologic unit's lithologic heterogeneity.

2.2.1.3 Cretaceous Deposits

Many studies of the Atlantic Coastal Plain near the Philadelphia Refinery have identified the presence of Cretaceous age sediments in the subsurface. These are the oldest sedimentary deposits in the area and are configured in a southeasterly-thickening wedge, overlain by the much younger Quaternary deposits described above and underlain by Piedmont crystalline bedrock. Greenman et al. (1961) detailed the age, character, configuration, and hydraulic properties of these deposits in southeastern Pennsylvania. At the time of that publication, the Cretaceous deposits were assigned primarily to the Raritan Formation and noted to represent three distinct, fining-upward cycles of non-marine sedimentation. Similarities to lithologic sequences identified on borehole logs were correlated to previously-identified strata at their type locality in New Jersey, where the deposits are much thicker and more easily distinguished. Other similar, near time-equivalent geologic formations of Cretaceous age were elsewhere identified in Maryland and Delaware (Jordan, 1962), and more recently authors began wholly referring to the Cretaceous deposits in south Philadelphia as the Potomac-Raritan-Magothy (PRM) aquifer system.

In south Philadelphia, the PRM aquifer system is subdivided into six geologic units in order of increasing age:

- The upper clay unit
- Upper sand unit
- Middle clay unit
- Middle sand unit
- Lower clay unit
- Lower sand unit (Schreffler, 2001)

Near the Philadelphia Refinery, it is generally true that these units thin, intercalate, and exhibit gradual facies changes that make separation of individual units difficult. Total thickness of PRM deposits at the facility ranges from 0 feet, where Quaternary deposits are present atop bedrock, to more than 100 feet within paleochannels incised into bedrock. A structure contour map of the top of the bedrock surface is included on Figure 11. Details of the individual units based on boring log

records and published descriptions as presented in the AOI 1 RIR (Stantec, 20016) are presented below.

2.2.1.3.1 Upper Clay Unit

The upper clay unit is a variegated clay/silt that is sometimes discernible from older clay units of the PRM where sandy and gravelly. In general, it is thin when compared to the other PRM clay units in south Philadelphia, and in places distal to the Delaware River the upper clay may be entirely absent (Greenman et al., 1961). On the basis of geophysical log signature, others have mapped the upper clay to be at least 0.5 feet thick and up to 30 feet thick at the Philadelphia Refinery, exhibiting its greatest thickness in northern portions of the study area while pinching out to the south (IST, 1998). At the Philadelphia Refinery, Stantec assigned the upper clay to first occurrences of light brown, tan, mauve, yellow, gray, and less-commonly, red sandy, silty clay beneath the Quaternary alluvium. However, overall stratigraphic correlation of the PRM across the facility supports the upper clay unit pinching out or being truncated by younger deposits throughout most of the AOIs (Figure 8).

The upper clay unit by nature acts as a confining or leaky confining bed. Where present, it creates hydraulic separation between the upper sand unit and water-table aquifer.

2.2.1.3.2 Upper Sand Unit

The upper sand unit is a varicolored but predominantly brown to gray sand with varying amounts of gravel, clay, and silt (Greenman et al., 1961). Nearer the Philadelphia Refinery, it has been described as mostly silty and/or clayey fine to medium sand (IST, 1998). Where the upper clay is absent, the upper sand occurs directly beneath, and is typically discernable, from the coarser and more heterogeneous Trenton gravel above. Stantec used color and lithologic changes, in addition to subtle changes in drilling conditions including Standard Penetration Test (SPT) blow counts, to make "picks" on upper sand occurrences (Stantec, 2016) to create the current geologic interpretation for the facility. In general, the upper sand appears restricted to northern portions of the refinery (AOIs 1, 2, 4, and 8) where it subcrops the Trenton gravel. The upper sand unit, where present, rarely exceeds 10 to 20 feet in total thickness.

The upper sand unit is an excellent aquifer where its thickness and extent are sufficient (Greenman et al., 1961). Aquifer testing of the upper sand unit in New Jersey has indicated that the aquifer has similar hydraulic properties to the middle and lower sand units where discrete (Navoy and Carleton, 1995). At the Philadelphia Refinery, Stantec did not identify any existing testing data for wells discretely screened across the upper sand unit from which to infer sole hydraulic properties (Stantec, 2016). The upper sand generally occurs in pockets beneath the Philadelphia Refinery and comprises a portion of the unconfined aquifer. Most wells that fully penetrate the unconfined aquifer in northern areas of the refinery may intersect and be influenced by the hydraulic properties of the upper sand.

2.2.1.3.3 Middle Clay Unit

Whereas other clay units of the PRM are described as being sandy and gravelly in places, the middle clay unit is generally regarded as being a laterally extensive and uniformly massive confining

bed of thick, red and white clay with very little sand (Greenman et al., 1961). Near the Philadelphia Refinery, others have found the middle clay to be nearly continuous in the subsurface (IST, 1998). Thicknesses of the middle clay unit generally range from approximately 20 feet, near the Belmont Terminal area, to just over 1 foot in southeastern AOI 1. While the middle clay appears to be everywhere present, at least on the eastern side of the Schuylkill River, its characteristically muddy texture can vary and become finely-laminated/bedded and intercalated with muddy sand. West of the Schuylkill River and particularly under areas north of Point Breeze, the middle clay unit (in addition to most if not all of the PRM) appears to have been incised and completely removed by erosion. Downgradient, nearer AOI 9 and the George C. Platt Bridge, some pockets or thin lenses of middle and/or lower clay may be present under a thick section of Quaternary alluvium. At other locations beneath the Philadelphia Refinery, the middle and lower clay units appear to be in direct contact with each other, where the middle sand is absent (Stantec, 2016).

The middle clay unit, in places resting directly on and combining with the lower clay unit, acts as a significant confining bed at the Philadelphia Refinery. In a regional context, it creates hydraulic separation between the unconfined aquifer and deeper, confined to semi-confined aquifer(s) of the middle and/or lower sand units.

2.2.1.3.4 Middle Sand Unit

The middle sand unit is a light-colored, stratified, fine to coarse sand with occasional gravel and clay that was generally deposited in lenticular masses along the axes of troughs carved into the lower clay unit (Greenman et al., 1961). As such, it is by nature discontinuous in the subsurface. Stantec has mapped the presence of middle sand at the Philadelphia Refinery based on stratigraphic position and where present, is commonly described on boring logs as brown or orange sand and gravel. In some areas where the lower clay was entirely removed, it may be indistinguishable from and rest unconformably atop the lower sand unit. At those locations, Stantec used subtle changes in sample descriptions, including color and/or texture, of the sequences of sand below the middle clay to infer the contact between those units. The middle sand unit, where discernable from the lower sand, has been observed at thicknesses up to approximately 15 feet beneath the Philadelphia Refinery and is generally thickest in lenticular or tabular bodies.

Much like the other sand units of the PRM, the middle sand unit can be a prolific aquifer where it is laterally continuous and of sufficient thickness. Aquifer testing of the middle sand in New Jersey has indicated that the aquifer has similar hydraulic properties to the lower sand unit (Navoy and Carleton, 1995). At the Philadelphia Refinery, Stantec did not identify any wells discretely screened across the middle sand unit from which to infer sole hydraulic properties (Stantec, 2016). Most deep refinery wells are screened in the lower sand, or potentially across the lower and middle sand units, where hydraulically connected.

2.2.1.3.5 Lower Clay Unit

Published descriptions of the lower clay unit indicate that it appears very similar to, and is sometimes inseparable from, the middle clay unit where the middle sand is absent. The lower clay is generally tough, red clay but is known from drilling records to contain softer zones of gray clay stratified with fine sand. The lower clay tends to exhibit its greatest thickness along the lateral margins of paleochannels in underlying bedrock, and can be thin to absent along the axes of

paleochannels where eroded prior to deposition of the middle sand unit (Greenman et al., 1961). Of the PRM clay units, Stantec has interpreted the lower clay unit to be the least significant at the Philadelphia Refinery in terms of both its lateral extent and vertical thickness. (Stantec, 2016) This is based on stratigraphic correlation and likely the result of erosion prior to deposition of the middle sand. Generally gray and red, commonly sandy clay and muddy sand zones were assigned to the lower clay if observed below and distinguishable from the middle clay. Where present, the lower clay was observed at thicknesses ranging from less than 1 foot to no greater than 10 feet. The lower clay appears to thicken and become more continuous to the south and east of the Philadelphia Refinery.

Where physically connected, the lower and middle clay units combine to form a significant confining bed at the Philadelphia Refinery. In a regional context, they create hydraulic separation between the unconfined aquifer and deeper, confined to semi-confined aquifer of the lower sand unit. The lower clay can also create localized areas of hydraulic separation between the lower and middle sands, where discretely present.

2.2.1.3.6 Lower Sand Unit

The lower sand unit is a varicolored but predominantly white to yellow sand with gravel, usually fining upward to a cap of fine to medium sand with occasional yellow and gray clay lenses. As further described below, the lower sand unit is the oldest of the PRM deposits and rests unconformably atop bedrock. The lower sand is generally thickest (up to 87 feet thick) along the axial troughs of paleochannels carved into bedrock by discharge through former positions of the Schuylkill and Delaware Rivers (Greenman et al., 1961). At the Philadelphia Refinery, the lower sand unit is present as a nearly continuous deposit, with the exception of some areas west of the Schuylkill River where it appears that the river entirely removed the PRM. Where present, the lower sand unit is observed to range in thickness from approximately 20 feet to a maximum of just over 50 feet, where it fills a bedrock paleochannel beneath a portion of AOI 1. Philadelphia Refinery borehole logs indicate that the lower sand unit is commonly yellow, white, and pale gray in color and predominantly medium to coarse sand with gravel, or gravel with sand. The lower sand's gravelly texture beneath the refinery has been well documented on drilling logs.

Of the PRM aquifer system, it can be argued that the lower sand unit was historically the most important groundwater resource in south Philadelphia. Figure 10 summarizes hydraulic information available for the lower sand unit, based on published aquifer testing results. Proximal to the Philadelphia Refinery at the Philadelphia Naval Shipyard (PNSY), a wealth of historical testing data is available for the lower sand unit and indicates an average k value of approximately 134 ft/d. Across the Delaware River in New Jersey, k values seem to be slightly higher. At the Philadelphia Refinery, there are several wells that appear to be discretely screened within the lower sand unit. However, Stantec did not identify any aquifer testing data derived from testing of onsite lower sand wells (Stantec, 2016). It is noted that Stantec recently installed two new AOI 4 monitoring wells screened within the lower sand unit aquifer. Those wells will be utilized for the collection of slug test data and for two short-duration, constant-rate pumping tests to estimate lower sand hydraulic properties at the Philadelphia Refinery. The data from this testing will be submitted in future Act 2 submittals.

2.2.2 Bedrock

Bedrock beneath the Coastal Plain near south Philadelphia has been inferred from surface outcroppings above the "Fall Line," and has been described in the subsurface where penetrated by past drilling activities. Bosbyshell (2008) has mapped schist of the Wissahickon Formation to occur in Philadelphia along the "Fall Line" (Figure 6). Relatively small bodies of granitic gneiss, resulting from igneous intrusions into the country rock during metamorphism, can also be present. Most boring log records of deep holes drilled at the Philadelphia Refinery indicate that schist is present beneath the Coastal Plain, in agreement with published maps.

Available data pertaining to the bedrock surface beneath the Philadelphia Refinery suggests that the surface generally dips to the southeast but contains local complexity. Greenman et al. (1961) recognized the presence of four paleochannels incised into bedrock and attributed those features to previous positions of the Schuylkill River. Two of those channels, referred to as the Schuylkill River and League Island Troughs by those authors, occur beneath parts of the Philadelphia Refinery and influence the total thickness of the Coastal Plain sedimentary sequence above them (Figure 11). Through boring log review, Stantec has identified additional detail in the bedrock surface beneath the Philadelphia Refinery, including a small bedrock paleochannel beneath the southern portion of AOI 1 that appears to be an extension of the League Island Trough, and a few localized bedrock surface highs (pinnacles) (Stantec, 2016).

In general, bedrock can store and transmit groundwater primarily through secondary porosity structures (e.g., fractures, joints). Bosbyshell (2008) indicates that the Wissahickon Formation can yield up to 20 gpm to wells in the mapped area above the "Fall Line." Balmer and Davis (1996) indicate that in Delaware County, Pennsylvania, the Wissahickon Formation is the most productive of the consolidated rock aquifers present in that county and can yield anywhere from 0 gpm to 300 gpm to wells (data from 127 wells). However, the wells included in their report were generally located above the "Fall Line" and were not screened below significant accumulations of Coastal Plain sediments. In general, when compared to the permeability and thickness of the Coastal Plain deposits, the water-bearing properties of the Wissahickon Formation beneath the Philadelphia Refinery are considered de minimis.

3. Soil Investigation

The following sections summarize the soil investigation activities performed as part of the remedial investigation activities in AOI 6. The site characterization activities conducted for the RIR in 2016/2017 were completed by Stantec, GHD and Aquaterra, on behalf of Evergreen. The goal of the 2016/2017 activities was to characterize soil in potential source areas, such as historic product handling and storage locations, open storage tank incident areas, and known product releases. Investigations before 2016-2017 are summarized in Section 3.1.

All characterization fieldwork was performed in accordance with Evergreen's *Quality Assurance/Quality Control Plan and Field Procedures Manual (*Appendix B). Soil borings were advanced using a variety of methods including hand auger, backhoe, split spoons in conjunction with hollow stem augers, and split spoons driven using direct push methods. The general strategy for the investigation was to characterize soil in the 0 to 2 ft. bgs and greater than 2 ft. bgs intervals

(unsaturated soil). Generally, subsurface soil samples were collected at the depth exhibiting the highest photoionization detector (PID) response and/or above the water table. Delineation was performed to the highest of the Act 2 non-residential SHS, the non-residential direct contact MSC, and the numeric SSS (for lead). Soil samples from BH-16-014 through BH-16-16 and from well installations B-172 through 175 were initially sampled for volatile organic analyses (VOCs) and then were re-sampled for semi-VOCs (SVOCs). The soil sample from BH-16-041 was only analyzed for pH in accordance with Table 2.

Table 2 summarizes the soil boring rational and soil boring logs are included in Appendix C. All soil analytical results are summarized in Tables 3a and 3b, which compares the results to the 1) non-residential SHS (as previously defined in this report, the more stringent of the soil to groundwater MSC and the direct contact MSC), 2) the non-residential direct contact MSC, and 3) the numeric SSS (for lead) (Soil Screening Levels). Samples were analyzed for the COCs on Table 1. Analysis of soil samples was conducted by Lancaster Laboratories. All laboratory analytical reports from this investigation work are included in Appendix D.

3.1 Summary of Previous Soil Analytical Results

Soil data collected during previous soil investigations are summarized in Tables 4a and 4b and the locations are shown on Figures 12a and 12b. The soil data summarized on Tables 4a and 4b were collected from 2002 to 2016 during RCRA, Act 2 and Tank investigation activities. The majority of the previous data collection activities were completed in support of the 2006 SCR/RIR and the 2013 SCR/RIR. A total of 57 soil borings and 20 monitoring wells were installed during the 2006 and 2013 site characterization activities. Information from these investigations is presented in the 2006 SCR (Langan, 2006) and the 2013 SCR/RIR (Langan, 2013).

Soil sampling was completed from 20 borings within SWMU 92 and from six borings in SWMU 95 between 2006 and 2012. No leaded tank bottom materials were observed in SWMU 92 (Storage Tank Areas: Buried Lead Sludge Area 6). Therefore, Sunoco requested a Final Agency Determination for SWMU 92 in AOI 6 from USEPA in 2013. Potential leaded tank bottom materials were observed in four soil samples from SWMU 95 (Storage Tank Areas: Buried Lead Sludge Area 9). The lead results were below the SSS for all samples and the TCLP results collected for three samples were below the USEPA maximum concentration of lead for toxicity concentration of 5 mg/L. Therefore, Sunoco requested a Final Agency Determination for SWMU 95 in AOI 6 from USEPA in 2013. A SWMU closure request letter will also accompany the copy of this report to the USEPA.

A total of 31 soil borings with soil sampling were advanced outside of the SWMU areas. Soil sampling also occurred during the installation of 14 monitoring wells in 2006 and six monitoring wells in 2012. The soil borings locations are shown on Figures 12a and 12b, as historic soil borings, the soil data from these investigations is summarized in Tables 4a and 4b. The 2006 and 2013 SCR/RIRs are included in Appendix J.

AOI 6 includes ASTs and many soil samples have been collected for tank characterization and closure under 25 PA Code Chapter 245, in addition to the sampling completed as part of the Act 2/One Cleanup Plan activities. Although the rationale and results of all of these soil sampling projects are not discussed in detail in this RIR, as they have been submitted to PADEP under 25 PA

Code Chapter 245 reporting, they are relevant to the characterization of AOI 6 under Act 2. The analytical results for these tank-related assessments are included in Tables 4a and 4b, and the soil sample locations are shown on Figure 2 as historic sample locations. The investigation of select tank incidents was performed as part of the field effort for this RIR, and those results are discussed in the following sections.

3.2 Historic Product Handling/Storage Areas

In order to investigate areas of historic product handling and storage, soil borings were advanced within the area of former Tank 237, former Tank 238 and Tank 251 during the 2016 site characterization activities. These borings included boring BH-16-039 in the vicinity of Tank 237 and BH-16-010 and SB-16-011 in the vicinity of Tank 238. None of the soil results from these borings exceeded the SHS.

3.3 Open Storage Tank Incidents

Evergreen intends to address all open AOI 6 storage tank incidents for which it is responsible through the 25 PA Code Chapter 245 CAP Program under separate cover. In 2014, the PADEP provided Evergreen with a list of the open Evergreen tank incidents in the PADEP database for AOI 6. One of the tank releases, PADEP Release Incident Number 37546 for Tank 250, was originally listed as on open incident by the PADEP in their 2014 summary of open incidents but was changed to closed in accordance with Mr. David Brown's Technical Review Memo dated August 29, 2017 which is included in Appendix E. PADEP release incident 46762 was assigned to a tank containing Nalco which is a filming agent (cyclohexylamine) used as an additive for boiler feedwater. Discussions with Sunoco personnel confirmed that this material was held in small temporary plastic tanks and therefore their location can not be shown on the figures. Cyclohexylamine is very biodegradable (Handbook of Environmental Fate and Exposure Data for Organic Chemicals, 1990) and is not expected to have lasted in the environment. Based on these conditions, no impacts are expected for the incident and therefore no further investigation was completed for incident 46762.The remaining open tank incidents are summarized in Table 5.

Soil characterization activities were conducted to further investigate the open storage tank incidents within AOI 6. For borings associated with storage tank incidents that involve releases within tank berms, soil analytical results are presented in this RIR for informational purposes only, as they relate to overall AOI 6 soil characterization. These data will be used in separately prepared SCRs for the identified open storage tank incidents, which will be submitted under separate cover to the PADEP in order to satisfy the requirements of 25 PA Code Chapter 245. The following summarizes the incidents that the PADEP provided to Evergreen, available information for these tanks, completed investigation activities during the 2016 site characterization activities and whether this tank will have a separate SCRs submitted to fulfill the requirements of 25 PA Code Chapter 245.

This section also includes groundwater data from the 2016 site characterization activities, if applicable to the discussion of the Tank Incident. The groundwater results are further discussed in Section 4.

3.3.1 GP T81 (Former PADEP Tank 121A, Incident 45692)

On September 11, 1993, a split in a line caused the release of approximately 100 gallons of liquid caustic onto the ground. The release was reported to PADEP on September 12, 1993 and Incident No. 45692 was assigned by the PADEP. A confirmation letter was sent to PADEP on October 4, 1993. The letter stated the liquid caustic was vacuumed up and the contaminated soil was removed for treatment. During the 2016 site characterization activities, three borings, BH-16-040, BH-16-041, BH-16-043 were completed in the vicinity of Tank 81. Sampling during the AOI 6 RI was conducted to characterize this release incident by analyzing for pH. The results indicate a pH range of 7.86 to 9.15 standard units (s.u.). The calculated median is 8.12. A SHS does not exist for pH. The pH results indicate the soil is slightly alkaline; however, these levels do not create hazardous condition. The pH results in groundwater in B-39 during the groundwater sampling in 2016 ranged from 7.3 to 7.5.

Although not related to the release, samples from BH-16-040, BH-16-041, and BH-16-043 had exceedances of the SHS for benzene, naphthalene, 1,2,4 TMB, none of these sample results exceeded the NRDC. The soil samples in BH-16-041 collected from 0.75 to 1.25 feet exceeded the SSS for lead, but it was vertically delineated by the soil sample collected from BH-16-041 from 1.75 to 2.25 feet. This SSS exceedance was horizontally delineated by four additional borings which were completed in 2017, BH-17-003 to 005 and BH-17-009.

3.3.2 GP 676 (Former Tank GPU 676, PADEP Tank 130A, Incident 4844)

Tank 676 was used to store No. 6 fuel oil. On July 19, 1998, 60 barrels of No. 6 fuel oil were released into the tank dike. Sunoco immediately took corrective action and recovered 59.5 barrels of fuel from the tank dike area. Sunoco notified the PADEP of the incident on July 20, 1998 and submitted a Notification of Reportable Release on August 10, 1998. Incident No. 4844 was assigned to this release by the PADEP. Boring BH-12-104, completed during the 2012 site characterization activities, is located in the area of former Tank 676 and had no exceedances of the SHS. During the 2016 site characterization activities, one boring BH-16-006 was completed in the tank dike of former Tank 676 and none of the soil samples collected from this boring exceeded the SHS.

Stantec conducted closure sampling within the tank berm of Tank 676 for PES in December 2016. Nine samples were collected as part of this investigation, GP676-1 though GP676-9. No obvious contamination was observed during the soil sampling. None of the samples had exceedances of the SHS. Groundwater well B-95, located in area of Tank 676, had one slight exceedance of the SHS for an estimated concentration of benzo(a)pyrene. Stantec's AST Closure Report Form for Tank 676, dated December 16, 2016 is included in Appendix J.

3.3.3 GP 797 (Former PADEP Tank 097A, Incident 29122)

GP 797 was an above ground storage tank (AST) which contained process water that contained light-end hydrocarbons (e.g., benzene and cumene) that was closed-in-place. The in-place closure of tank GP 797 was completed on April 30, 2002, by Sunoco. As part of the closure activities, four hand augers borings (HA-1, HA-2, HA-3, and HA-4) were completed and shallow soil samples were collected at each location, with two samples collected at HA-3. Benzene was detected at

concentrations above the NRDC in two samples. The SHS was exceeded for benzene, ethyl benzene and toluene. Based on these results Sunoco notified the PADEP of a release on June 10, 2002. PADEP issued a Notice of Violation (NOV) dated July 29, 2002 and Incident No. 29122 was assigned. In the NOV, PADEP requested a characterization of the extent of soil contamination and impact submitted in an SCR.

Sunoco submitted a closure assessment report to the PADEP for AST 797 dated July 10, 2002. Sunoco subsequently submitted a SCR for AST 797 to the PADEP dated December 12, 2002, to further characterize the release from this tank. The SCR documented the collection of three soil samples from three locations, MW-1, MW-2, and MW-3 completed outside of the containment dike. Benzene (in MW-1, MW-2, and MW-3) and toluene (in MW-3) exceeded the SHS during this sampling. Benzene also exceeded the NRDC in the soil sample collected from MW-3. Wells MW-1 through MW-3 were renamed B-149 through B-150 respectively.

During the 2012 site characterization activities, five additional soil borings with the collection of six soil samples were completed to further characterize Tank 797. Four of the borings were installed in the locations of HA-1 through HA-4 to characterize soil greater than two feet below grade. Benzene and toluene exceeded the NRDC in four of the five soil samples. The surface soil sample from boring BH-12-125 had no exceedances of the SHS. PADEP requested delineation to the northwest, north, and northeast of tank GP 797 in SCR comments dated November 22, 2013. Nine soil borings (BH-16-030 through BH-16-038) were completed during the 2016 site characterization activities to delineate conditions near the tank area within the limits of the tank berm. These samples had exceedances of the SHS for benzene, isopropyl benzene and toluene. In addition, the sample from BH-16-037 also exceeded the NRDC for benzene.

Groundwater from well B-155 located downgradient of tank 797 had exceedances of the groundwater SHS for benzene and benzo(a)pyrene during the 2016 site characterization activities as summarized in Table 7a.

3.4 Historic Releases

The following section discusses known historic releases that were investigated as part of the AOI 6 characterization activities. As part of the remedial investigation under Act 2, historic releases that may have created sources for COCs in soil were identified based on the available information. In order to identify areas that would require further investigation, a review of internal facility files was completed by Evergreen. PADEP also reviewed its records and provided information on historic incidents. Specific release locations were determined based on document descriptions and interviews with refinery personnel. Based on information obtained, targeted soil investigations were performed as described in the following subsections. This section also includes groundwater data from the 2016 site characterization activities, if applicable. The groundwater results are also further discussed in Section 4.

3.4.1 'Area West of' GP 676, or '2000 Surface Release'

On September 29, 2000, approximately 15,000 gallons of No. 6 fuel oil from No. 3 Boiler House was released from a product line outside of the tank berm for Tank 676. Approximately 7,500 gallons of product was recovered by vacuum trucks, a boom was set up due to the proximity to the bulkhead

and the contaminated soil was excavated and sent for off-site disposal. Since the release occurred outside of a tank dike, this is considered a historic release even though the PADEP assigned incident number 6133 to this event. During the 2016 site characterization activities, five borings (BH-16-002 through BH-16-006) were completed to characterize conditions between the outside of the dike for Tank 676 and the bulkhead to characterize this area. None of the soil samples collected from BH-16-002 to BH-16-006 exceeded the SHS or the SSS for lead. Groundwater downgradient of these borings in monitoring wells B-170, B-153, B-168, and B-169 had no exceedances of the SHS with the exception of lead in B-169.

3.4.2 1733 Unit

Approximately 840 gallons of benzene were released at the 1733 unit (Bell Hood CUE 4B) on November 27, 1995 based on a review of Sunoco's records. Three borings were completed in this area during the 2016 site characterization activities (BH-16-007 through BH-16-009). None of the soil results from these borings exceeded the SHS.

3.4.3 Transfer Line Located Northeast of No. 4 Boiler House

Approximately 1,300 gallons of No. 2 fuel oil were released from a transfer line located north east of the No. 4 Boiler House and east of Tank 238 on September 3, 1993. Two borings were completed during the 2016 site characterization activities (BH-2016 -16-012 through BH-2016-16-013). None of the soil results from these borings exceeded the SHS.

3.4.4 1332 Line

Approximately 4,400 gallons of naphtha were released from the 8-inch line outside of the tank dike for GP-251 that lead to unit 1332 on February 2, 1994. Chevron personnel applied foam and then completed vacuum removal of the release. Three borings were completed in this area during the 2016 site characterization activities (BH-16-17, BH-16-018 and BH-16-023). None of the soil results from these borings exceeded the SHS. An additional three borings (BH-16-14 to BH-16-16) were completed inside the dike of Tank 251 during the 2016 field activities based on comments from former Sunoco employees. None of the soil results from these borings exceeded the SHS.

3.4.5 Main Office

Approximately 4,000 gallons of jet fuel were released from an underground line near the main office in September 1992. Three borings were completed during the 2016 site characterization activities (BH-16-019 to BH-16-022). None of the soil results from these borings exceeded the SHS, with exception of BH-16-019 which exceeded the SSS for lead. The lead detection in BH-16-019 was delineated by BH-17-001 and BH-17-002.

3.5 Delineation of Direct Contact MSC/SSS Exceedances

In order to complete horizontal and vertical characterization in soil, areas exhibiting exceedances of the non-residential direct contact MSC (and the SSS for lead) were delineated. These areas and associated investigations are described below:

- A historic soil sample (BH-30-09) from 0 to 2 ft. bgs had a lead detection above the SSS for lead and historic soil sample (BH-29-06) from 0 to 2 ft. bgs had a lead detection above the numeric SSS for lead and a BaP detection above the NRDC. Soil samples collected from B0152, BH-12-108, BH-32-09, BH-27-09, BH-28-09, BH-29-09, BH-31-09, and BH-27-06 delineate these NRDC.
- Historic soil samples GP-797-HA-1, GP-797-B-150, and GP-797-HA-3 in the GP-797 area from 0 to 2 ft. bgs had an exceedance of the NRDC for benzene. The soil samples from BH-16-029, BH-12-122, BH-12-119, B-149, BH-16-033, BH-16-32, BH-16-031, GP-797-HA-4, and BH-12-130 delineated these NRDC exceedances for benzene.
- Historic sample BH-12-128 had an exceedance of the NRDC for benzene. The soil samples from BH-16-032, BH-12-125, BH-16-031, and BH-16-033 delineated the NRDC for benzene.
- Historic soil samples BH-12-149, BH-12-129, BH-12-128, and BH-12-124 in the GP-797 area from >2 ft. bgs had an exceedance of the NRDC for benzene. The soil samples from BH-16-032, BH-16-033, BH-12-129, BH-16-036, BH-16-035, and BH-16-008 generally delineate this exceedance for benzene.
- Soil sample BH-16-037 from 0 to 2 ft. bgs exceeded the NRDC for benzene during the 2016 site characterization activities. This sample was delineated by BH-16-025, BH-16-026, BH-16-036, BH-16-038, and by BH-12-149.
- Soil sample BH-16-019 from 0 to 2 ft. bgs exceeded the SSS for lead during the 2016 site characterization activities. This sample was delineated by BH-16-021, BH-16-020, BH-17-002, and BH-17-001.
- Soil samples BH-16-041 and BH-17-004 from 0 to 2 ft. bgs exceeded the SSS for lead during the 2016/2017 site characterization activities. These samples were delineated by BH-17-003, BH-17-009, BH-17-005, BH-16-043, and BH-16-040.
- Soil samples BH-16-025 and BH-16-037 from greater than 2 ft. bgs exceeded the NRDC for benzene during the 2016 site characterization activities. These sample were delineated by BH-16-036, BH-16-034, BH-16-030, and BH-16-008. Additional sampling may be completed for BH-16-025 during risk assessment or remedial design activities.

3.6 Site Characterization in the 0-2 ft. bgs interval, 2-15 ft bgs Interval and Beneath LNAPL

In response to PADEP comments to previous site characterization activities and the February 19, 2016 meeting, additional soil sampling was completed to complete characterization in the 0-2 ft. bgs

interval, 2-15 ft. bgs. interval and beneath LNAPL. These results associated with the 2016/2017 site characterization activities are described below:

- As shown on Figure 12a, the following surface samples (0-2 ft. bgs) exceeded the NRDC (or numeric SSS for lead): BH-16-019 (lead), BH-16-041 (lead), BH-16-037 (benzene), BH-17-004 (lead) and BH-16-019 (lead) during the 2016/2017 site characterization activities.
- As summarized in Table 3a, Surface samples (0-2 ft. bgs) exceeded the soil to groundwater MSCs for benzene (BH-16-026, BH-16-029, BH-16-030, BH-16-031, BH-16-034, BH-16-036, BH-16-037, BH-16-038, BH-16-040, BH-16-043, and B-175), ethylbenzene (BH-16-037), isopropylbenzene (BH-16-037), toluene (BH-16-037) and lead (BH-16-003, BH-13-004, BH-16-007, BH-16-010, BH-16-011, BH-16-15, BH-17-003, BH-17-005) during the 2016/2017 site characterization activities.
- As shown on Figure 12b, the following subsurface samples (>2 ft. bgs) exceeded the NRDC for benzene: BH-16-025 and BH-16-037 during the 2016/2017 site characterization activities.
- As summarized in Table 3b subsurface samples (>2 ft. bgs) exceeded the soil to groundwater MSCs for benzene (BH-16-027, BH-16-029, BH-16-030, BH-16-031, BH-16-032, BH-16-034, BH-16-036, and BH-16-043), 1,2,4-trimethylbenzene (BH-16-025), isopropylbenzene (BH-16-037), naphthalene (BH-16-040) and toluene (BH-16-025 and BH-16-037) during the 2016/2017 site characterization activities.
- Soil samples from BH-17-003 and BH-16-040 were selected to be collected in the vicinity of well B-39 which has identified LNAPL to address the PADEP request for soil samples in LNAPL areas. None of the results from BH-17-003 exceeded the SHS. The soil results from BH-16-040 had an exceedance of the SHS for benzene, but none of the results exceeded the NRDC. In addition, soils from historical sampling events collected in LNAPL areas from 0-2 ft collected from BH-21-06, B-161, B-148, B-149, B-150, B-175 and BH-25-06 had no exceedances for the SHS with the exception of benzene (B-148, B-149, B-150, B-175 and BH-25-06) and toluene (B-150). The soil sample collected from 2-15 feet from B-175 did not exceed the SHS.

4. Groundwater Investigation

4.1 Historic Groundwater Investigations

Available well construction details are summarized in Table 6. Previous consulting reports in Appendix L describe the various historic groundwater sampling events that have been conducted within AOI 6. All of the available analytical data for wells located in AOI 6 from 2013 to present are presented in Table 8 and all available historic groundwater data are presented in Appendix K.

4.2 Well Installation Activities

This section describes well installation activities that were performed as part of the 2016 remedial investigation. Activities are discussed by purpose in order to clarify characterization goals. All fieldwork was performed in accordance with *Evergreen Field Procedures (*Appendix B). Monitoring well locations are shown on Figure 2. Well logs, including both lithologic information and well construction details, are included in Appendix C. Well construction details are also summarized in

Table 6. The following sections discuss the well installation strategy/rationale; however, a summary is also available in Table 2.

In order to better delineate LNAPL and dissolved benzene plumes interior to AOI 6, additional water-table monitoring wells B-172 through B-175 (WP9-1 replacement) were installed during the 2016 remedial investigation activities. An additional location, B-171 was attempted; however, the well was not installed due to the presence of a concrete floor in this area. Several attempts were made to install B-171, but the concrete flooring was encountered at each location. Prior to the installation of the monitoring wells, well locations were cleared for subsurface utilities to 8 ft. bgs using a vacuum truck. Monitoring well installation activities were performed using hollow stem auger methods by US Environmental of Mullica, New Jersey under the oversight of GHD in April 2016. During borehole advancement, surface and subsurface soil samples were collected for laboratory analysis of the COCs in Table 1. Continuous soil sampling using a split spoon sampler was performed. A GHD geologist screened soil with a PID and logged sample lithologies. LNAPL was not observed in B-172, B-173, B-174, or B-175.

4.3 Groundwater Sampling Events

A comprehensive characterization groundwater sampling event, consisting of 37 monitoring wells was conducted in May 2016. A second, more focused groundwater sampling event was conducted in August 2016 for B-39, B-43, B-116, B-117, B-125, B-126, B-132, B-133, B-145, B-150, B-158, B-164, B-169, U-4, URS-1, URS-2, URS-3, URS-4, URS-5, and the newly installed wells (B-172 to B-175). All fieldwork was performed in accordance with *Evergreen Field Procedures (*Appendix B). Monitoring well locations are shown on Figure 2. All samples were analyzed for the COCs (Table 1) by Lancaster Laboratories, located in Lancaster, Pennsylvania.

Analytical results for groundwater samples collected in 2016 and all historic results for AOI 6, are summarized in Tables 7a and b and in Appendix K, respectively. Concentrations of the following COCs were detected above the non-residential MSC during the 2016 groundwater sampling events: benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead. The following observations can be made concerning the groundwater exceedances:

- The benzo(a)pyrene groundwater MSC exceedances in B-162 and B-117 are delineated by B-116 and B-115.
- As shown on Figure 19, there are several wells with exceedances of the groundwater MSC for benzene. As shown on Figure 19, these wells are delineated in the downgradient direction with the exception of benzene in URS-5, which intermittently has detections of LNAPL, and is located adjacent to the bulkhead.
- One additional well with a benzene exceedance of the MSCs is B-152. This well is delineated by wells B-43 and B-168.
- Wells B-145, U-4, B-175, B-125, URS-3, B-173, and B-126 had SHS exceedances of benzene, SVOCs or lead which were delineated by B-174, URS-1, URS-4, and B-164.
- Wells B-156 and B-172 had SHS exceedances of benzene and SVOCs generally delineated by B-170.

- Groundwater samples from B-39, B-132, B-134, B-144, and B-150 were collected beneath LNAPL. As shown on Figure 19 and in Tables 7a and 7b, all of these samples had at least one detection above the groundwater MSCs as discussed below:
  - B-39 had low level exceedances of the MSCs for ethyl dibromide, benzo(a)pyrene, benzo(b)fluoranthene, benzo(b)fluoranthene, benzo(g, h, i)perylene, chrysene and lead.
  - B-132 had low level exceedances of the MSCs for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene which is delineated by URS-5 except for benzo(a)pyrene.
  - B-134 had low level exceedances of the MSCs of benzo(a)pyrene which is delineated by B-126 and URS-5.
  - B-144 had low level exceedances of 1,2,4-trimethylbenzene, benzene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene and chrysene which is delineated by B-126.
  - B-150 had elevated exceedances of the MSCs 1,2,4-trimethylbenzene, benzene, isopropyl benzene, and toluene and low levels of benzo(a)pyrene which is delineated by B-156 with the exception of benzo(a)pyrene which is delineated by URS-5.
- The remaining wells with groundwater MSC exceedances, B-43 and B-169, are located in close proximity to the bulkhead and will be evaluated through the site-wide fate and transport report.
- None of the monitoring wells screened in the lower aquifer had exceedances of the non-residential groundwater MSCs, as presented on Figure 20.

4.4 Well Gauging Activities

Stantec presently conducts annual groundwater and LNAPL gauging of all existing wells at the Philadelphia Refinery. The site-wide annual well gauging event, which is typically conducted during the second quarter of each year, is used to identify the presence of LNAPL and determine groundwater flow patterns. Liquid level measurements, groundwater contour figures, and product thickness figures are submitted to PADEP with the Philadelphia Refinery Remediation Program Groundwater Remediation Status Reports during the first half of each year. Groundwater elevation contours from the May 2016 annual gauging event is included on Figure 13. In addition to the annual events, the wells included in the September 2016 groundwater gauging event were gauged are shown on Figure 14.

5. Site-Specific Hydrogeologic Conditions

In Section 2 above, details regarding the methodology and interpretation of regional geologic conditions were presented. The purpose of this discussion of site-specific conditions is to refine the regional hydrogeologic framework to summarize conditions observed beneath AOI 6, with an emphasis on groundwater occurrence, groundwater flow, and hydraulic head potentials. It is understood that although this RIR is designed to address subsurface conditions beneath AOI 6, PADEP has previously requested that investigations of individual AOIs look beyond the boundary of the AOI being investigated. As such, GHD has utilized well gauging from AOIs 5, 6, and 7.

Groundwater contouring and evaluation of head conditions in the study area are included on Figures 13 and 14.

5.1 Geologic Formations and Units Observed

On the basis of available lithologic data from boring logs, the principle of stratigraphic position, results of past investigations, review of historical maps, attempted correlation of observed lithologies across the study area to a published geologic framework (e.g., Quaternary deposits and the PRM aquifer system) documented in the AOI 1 RIR (Stantec, 2016), GHD has interpreted the following stratigraphy in the subsurface beneath AOI 6. A generalized stratigraphic column is included as Table 10 and the cross section through the facility, including AOI 6, is shown on Figure 8.

5.1.1 Anthropogenic Fill

Apparent fill is present everywhere beneath the existing land surface in AOI 6 and has been identified averaging approximately 10 feet. Stratigraphic Profile E-E' (Figure 8) presents the interpreted fill thickness in AOI 6.

5.1.2 Recent (Holocene) Alluvium

Recent alluvial deposits that post-date the Trenton gravel are present beneath filled areas within AOI 6. In general, recent alluvium defines the antecedent topography that preceded industrialization at the Philadelphia Refinery. In large part, recent alluvium within the facility is fine-grained, brown to brownish gray silt/clay with occasional lenses of sand and gravel that commonly grades with depth to include some sand. In places, decomposing organic material has also been indicated. The thickness of the recent alluvium within AOI 6 has been observed to range from approximately 20 to 35 feet. The recent alluvium is the most significant units to occur beneath AOI 6, as shown on Figure 8.

5.1.3 Trenton "Gravel"

The Trenton "gravel" does not occur uniformly throughout AOI 6. The Trenton "gravel" ranges in thickness from approximately 10 feet to pinching out along the eastern boundary of AOI 6. Its predominant lithology appears to be silty, clayey, poorly-sorted sand with gravel, but includes secondary sandy gravel and clay/silt lithologies in lenses. As described site-wide, the Trenton gravel is a heterogeneous unit that is reflective of its depositional environment.

5.1.4 Upper Clay Unit/Upper Sand Unit/Middle Clay/Middle Sand/Lower Clay

The PRM upper clay/upper sand/middle clay/middle sand and lower clay units are not interpreted to be present beneath AOI 6. It appears that these units were truncated by erosion prior to or contemporaneous with deposition of the Trenton "gravel". The Trenton "gravel" or alluvium (where the Trenton "gravel" is absent) rests unconformably above the Lower Sand unit as shown on Figure 8.

5.1.5 Lower Sand Unit

In general, the lower sand coarsens with depth, from a dense fine to medium pale gray, pale yellow and white quartz sand to white and varicolored sandy gravel and gravelly sand. An area of sandy gravel has been mapped beneath AOI 6 in the Lower Sand Unit. The thickness of the lower sand in AOI 6 is approximately 20 feet.

5.1.6 Crystalline Bedrock

Bedrock where encountered, has been described as moderately to highly-weathered mica schist. As shown on Figure 6, bedrock elevations beneath AOI 6 range from a maximum of approximately -60 feet NAVD 88, near the AOI 7/AOI 3 boundary, to a minimum of approximately -80 feet NAVD 88 in the northwest portion of AOI 6.

5.2 Aquifer Hydraulic Properties

Two aquifers have been identified beneath AOI 6. In general, these are the water-table (unconfined) and lower (semi-confined) aquifers. Stantec identified and evaluated properties of those aquifers at the facility through review of approximately 300 well records as documented in the AOI 1 RIR (Stantec, 2016). Records reviewed included well gauging data and where available, lithologic logs, physical properties, and well/aquifer testing data. Hydrostratigraphic units were assigned by Stantec to wells where possible using the stratigraphic profiles and nearby and deep boreholes as control points. Overall, approximately 90 percent of existing monitoring wells used at the facility are screened across the unconfined aquifer and are designed to intersect the water table. Of the remaining 10 percent screened in the lower aquifer, approximately 9 percent partially penetrate the lower sand and 1 percent are screened in either the middle sand, or across the middle clay.

It is noted that intervening PRM upper sand and middle sand aquifers do not appear to be present beneath AOI 6. It is also noted that hydraulic head potentials between the unconfined and lower aquifers are downward across AOI 6. These site-specific hydrogeologic conditions are discussed further below and are supported by Figures 13 and 15 which show groundwater elevation contours for both aquifers for 2016.

5.2.1 Methodology for Evaluation of Hydraulic Data

For the purposes of evaluating hydraulic head, flow direction(s) and magnitudes of groundwater flow for the aquifers identified in this RIR, GHD reviewed 2015 and 2016 water levels from annual, site-wide gauging data within the facility. For wells gauged by GHD, depth-to-water measurements were collected with an optical interface probe and reported to the nearest hundredth of a foot. Water-table elevations were calculated using surveyed well top-of-casing elevations and, where necessary due to LNAPL accumulations, corrected using LNAPL density data from the nearest available LNAPL sample data (see Table 9) for density assignments and for gauging data)

5.2.2 Unconfined (Water-Table) Aquifer

Beneath AOI 6, the unconfined aquifer is primarily composed of saturated portions of the fill and alluvium and the Trenton "gravel." On average, the saturated thickness of the unconfined aquifer beneath AOI 6 is approximately 20 to 30 feet. As a part of the AOI 1 RIR, Stantec (Stantec, 2016)

mined existing data and has identified estimations of horizontal hydraulic conductivity (k_h) for the unconfined aquifer from 15 in-situ aquifer (slug) tests and two, short-duration pumping tests (see Figure 9). None of these tests were identified in AOI 6. From those tests, estimated values of unconfined aquifer k_h vary two orders of magnitude across the facility. The wide range of estimated values of k_h is reflective of the heterogeneous nature of the Trenton gravel. Anomalously low values of k_h may also be the result of poor well-aquifer hydraulic communication related to inadequate well development, or fouling of the well screen. Stantec is presently evaluating potential values of reported unconfined aquifer k_h as a part of site-wide numerical model calibration and sensitivity analysis.

5.2.2.1 Hydraulic Heads and Groundwater Flow

As shown on Figure 14, water-table mounds are apparent in AOI 6. These mounds are found immediately adjacent to the bulkhead and one is in the southeastern portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. There are also two areas of groundwater depression in the eastern and central portion of AOI 6. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours. Evaluation of groundwater mounding/depression is an important component of understanding horizontal hydraulic gradients since they strongly influence contaminant fate and transport in an analytical or numerical model.

Groundwater flows to the south west towards the river. The gradient towards the southwest is 0.0019 ft/ft. This pattern is consistent with the historical contours and supports that flow in AOI 6 is towards the river.

5.2.3 Semi-confined (Lower) Aquifer

Groundwater flow within the lower aquifer beneath AOI 6 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces are shown on Figure 15 for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the southwest under a hydraulic gradient of approximately 0.002 ft/ft.

GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 6. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2013 RIR).

Beneath the study area, the lower aquifer is primarily composed of saturated portions of the lower sand unit. On average, the saturated thickness of the lower aquifer beneath AOI 6 is approximately 25 feet. There is no available aquifer testing data for the lower aquifer at the facility. Evergreen is planning on conducting slug and hydraulic tests on the lower aquifer in AOI 4 in support off the facility wide fate and transport modeling. At the time of this RIR however, the best available k_h data for the lower aquifer is estimated from historical testing performed at the Philadelphia Naval Shipyard and has been summarized on Figure 10. From those tests, values of lower sand k_h are estimated to vary from approximately 123 ft/d to 151 ft/d.

6. LNAPL Investigation

6.1 LNAPL Characterization Sampling

Various petroleum products have been stored and distributed within AOI 6. Historic testing has been completed to characterize the LNAPL at the Site. The results of the tests are summarized in Appendix F and are discussed below. Stantec has gone back through the historic LNAPL sampling and has reclassified some of the LNAPL types as summarized in Table 11, these re-classifications are also included below.

2004

In 2004, LNAPL samples from wells B-129, B-130, B-144, B-39, B-43, and WP 9-2 were collected and submitted to Torkelson Geochemistry, Inc. (Torkelson) for analysis. Torkelson completed gas chromatograph analysis of the samples. LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well B-129 is located near the eastern border of AOI 6. Torkelson characterized the sample from B-129 as being severe-extremely weathered middle distillate with heavier material and gasoline (Langan, 2004).
- Well B-130 is located near the western border of AOI 6 along the bulkhead. Torkelson characterized the sample from B-130 as being severely-extremely weathered middle distillate and residual oil (Langan, 2004).
- Well B-144 is located near 2nd Street. Torkelson characterized the sample from B-144 as being severely weathered gasoline and residual oil (Langan, 2004).
- Well B-39 is located in the southwestern corner of AOI 6. Torkelson characterized the sample from B-39 as being severely weathered middle distillate and gasoline (Langan, 2004).
- Well B-43 is located along the bulkhead in the northwestern area of AOI 6. Torkelson characterized the sample from B-43 as being extremely weathered middle distillate (Langan, 2004).
- WP 9-2 is located along 2nd street in the southwestern corner of AOI 6. Torkelson characterized the sample from WP 9-2 as being severely weathered aviation gasoline and middle distillate (Langan, 2004).

2006

In 2006, LNAPL samples from wells B-47 and B-150 were collected and submitted to Torkelson Geochemistry, Inc. (Torkelson) for analysis. LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well B-47 is located near the center of AOI 6. Torkelson characterized the sample from B-47 as being extremely weathered residual oil with a trace of unknown aromatics (Langan, 2006).
- Well B-150 is located west central of AOI 6. Torkelson characterized the sample from B-150 as being unknown aromatics with unknown weathering (Langan, 2006).

2013

- During the January 2013 groundwater sampling event, 19 monitoring wells had measureable (>0.01 feet) LNAPL.

6.2 LNAPL Distribution

Numerous monitoring wells across AOI 6 have been gauged for LNAPL over the course of implementing the investigation and remediation programs. Stantec completed LNAPL and groundwater elevation gauging events in May 2016. During this event, 76 wells were gauged in the unconfined and semi-confined zones. LNAPL was detected in 21 wells with a maximum thickness of 4.27 feet at well B-116 during the May 2016 gauging. Figure 16 presents the May 2 2016 apparent LNAPL thicknesses from a limited groundwater gauging event and Figure 17 presents the LNAPL thickness from the May 11 2017 annual gauging.

A shown on Figure 16, during the May 2016 event there was three main areas with LNAPL detections:

- LNAPL in wells B161, B-124, B-175 delineated by B-173 and B-125.
- LNAPL in wells B-143, B-142, Sump-1, B-138 and B-147 delineated by B-126, B-138, B-141, B-134 and B-133.
- LNAPL in wells B-150, B-149 and B-148 delineated by B-155, B-156, B-163and B-154.

LNAPL was also detected in isolated wells B-130, URS-3, B-152, RW-9, U-3, and B-129 delineated by adjacent wells.

Based on evaluation of multiple lines of evidence, as presented in Appendix F (LNAPL Evaluation), LNAPL is largely present as hydraulically immobile and unrecoverable residual that is stable in overall extent. The fact that the 27 Pump House Total Fluids Recovery System has been off since September 20, 2010 and passive remediation was discontinued on January 26, 2015, with no perceived rebound in LNAPL thicknesses, also lends support to this assertion.

7. Vapor Investigation

The vapor intrusion pathway in AOI 6 was evaluated for potential receptors of vapors originating from subsurface soil or groundwater, in accordance with the PADEP, Land Recycling Program; Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2, January 2017 (VI Guidance).

7.1 Indoor Air Sampling

Evergreen and PES identified structures that could be occupied in AOI 6 during the initial building survey and the October 2017 building survey review, as shown in Table 12 and on Figure 18. During this survey 16 structures were identified as routinely occupied or potentially occupied. These buildings included: Building 6636, 24 Gate Building 295, Lab/Bottle Washing Building 163, Girard Point Training Building 651, Girard Point Main Office Building 650, Capital Projects Tank Group

Trailers, Control Room 739, Trade Shops 178, Carpenter Shop 726, North Tank Field Blockhouse 475, WTP Control Room 745, Control Room 6627, Control Room south of Boiler House #3, Former Locker House associated with former Boiler House #2, and Office near Separator. The characteristics of several of these buildings were such that vapor intrusion is not considered a complete pathway. The building-specific conditions are as follows:

- Refinery Lab/Bottle Washing Building 163 – broken windows visible throughout that allows outdoor air flow
- Capital Projects Tank Group Trailers – elevated trailers with perforated soffit-style skirt that allows outdoor air flow
- Control Room south of Boiler House #3 – elevated without a skirt
- Former Locker House near former Boiler House #2/Process Building – locked and inaccessible, not occupied
- Office near Separator – blast resistant building sitting on ground and fork truck holes at the surface (to facilitate relocation)
- Paint Shop Building 701 – accessible but unoccupied
- Insulation Building 265 – unoccupied building used for storage

Indoor air and outdoor ambient (background) air samples were collected in March 2016 and March 2017 from the occupied buildings where the vapor intrusion pathway is potentially complete. The numbers of samples collected for each building was based on a combined approach from Appendix Z of the PADEP VI Guidance and professional judgement. The data from these sampling events are summarized in Table 13 and the locations sampled are shown on Figure 18.

A building survey and inspection was conducted to identify any potential indoor air sources of volatile organic compounds (VOCs) possibly already present within the building (e.g., smoking, cleaning products, building products, manufacturing chemicals, etc.), the number and frequency of occupants within the various buildings, and potential preferential migration pathways through the building slab (e.g., utility conduits, slab cracking, etc.). At each building GHD completed an Indoor Air Sampling Field Sheet, which is included in Appendix K.

Indoor and ambient air samples were collected using 6-liter capacity Summa™ canisters in a suitable location(s) in each building at a representative breathing zone height (i.e., 3 to 5 feet above grade). Canisters were laboratory-certified clean in accordance with Appendix Z of the PADEP draft VI guidance. The canisters were fitted with a laboratory-calibrated critical orifice flow-regulation device sized to limit the indoor air sample collection flow rate to allow for 8-hour sample collection. Canisters maintained a minimum residual negative pressure of approximately 1 to 5 inches of mercury following sample collection. Written documentation of all field activities, conditions, and sampling processes, including names of field personnel, dates and times, etc. were recorded. Documentation included building designation, building use, occupant information, and weather conditions at the time of sampling (temperature, barometric pressure, wind direction and speed, and humidity).

Outdoor air sampling locations were selected for collection of an ambient air sample in AOI 6. The outdoor locations were set at the same general elevation of the samples in the buildings and were in a position that is generally upwind of the buildings being assessed.

Table 13 summarizes the indoor air and outdoor data and compares the detected concentrations to the generic screening criteria. As shown in Table 13, all detected concentrations of constituents in indoor air were below the Pennsylvania generic non-residential SHS for indoor air, except IA-AOI6-6627 (Building 6627 Control Room), which exceeded for benzene. As shown on Table 13, the benzene concentration at this locations also exceeded 1/10th of the SHS. The location of indoor and outdoor air samples is shown on Figure 18.

One additional round will be conducted and reported in a future submittal. If concentrations continue to be detected above the indoor air screening level in IA-AOI6-6627 (Building 6627 Control Room) or other locations, then it will be addressed through risk assessment or remedial activities as presented in the site-wide Risk Assessment report or site-wide Cleanup Plan.

7.2 Air Sampling over LNAPL Plumes

In March 2016, two air samples (two locations) were collected to evaluate outdoor air quality in locations over NAPL plumes within AOI 6, at the request of the PADEP. The locations of these samples are shown on Figure 18 and the results are summarized in Table 14. These samples were collected from the breathing zone (3 to 5 feet above ground level) using Summa© canisters with laboratory-provided regulators set to collect air over one continuous 8-hour period. The samples were packaged by field personnel and transported by FedEx to Lancaster Laboratories under Chain-of-Custody documentation for analysis of volatile organic compounds (VOCs) on the Act 2/One Cleanup program petroleum short list by EPA Method TO-15.

Table 14 summarizes the outdoor air data collected over NAPL plumes and compares the detected concentrations to background concentrations. PADEP operates a network of air toxics monitoring stations that analyze for VOCs. Regional ambient air quality in the Philadelphia area where the refinery is located is best represented by data from the Marcus Hook monitoring station (latitude 39.8178, longitude -75.4142). USEPA's background residential indoor air values are also included in Table 14 to determine whether detected concentrations are within background levels. As shown in Table 14, the results for the ambient air samples collected from over LNAPL in AOI 6 are within the background levels for this area. The location of indoor and outdoor air samples is shown on Figure 18. No additional sampling is proposed for the air quality over the LNAPL areas.

8. Quality Assurance/Quality Control

All fieldwork conducted as part of the site characterization activities was performed in accordance with the methods outlined in Appendix B, Evergreen Field Procedures. Methods established by Evergreen to examine data quality are outlined in the Evergreen Data Usability Standard Operating Procedure (SOP). An assessment of analytical data collected as part of this investigation under the SOP is also included in Appendix H in the data usability assessment. The following sections describe specific aspects of quality assurance/quality control procedures that pertain to the activities outlined in this report.

8.1 Equipment Decontamination

All sampling equipment was either dedicated or decontaminated in accordance with the field sampling procedures to prevent cross-contamination. Prior to sampling, the equipment was decontaminated with successive rinses of detergent, potable water, and distilled water.

8.2 Equipment Calibration

Air quality monitors used for both air monitoring and soil screening were calibrated prior to use. Both a zero calibration and a span calibration using gases of known concentration as recommended by the manufacturer (i.e., 100 parts per million by volume (ppm_v) isobutylene for the photoionization sensor) were performed.

8.3 Sample Preservation

Samples were placed directly into chemically preserved and/or non-preserved glassware provided by the analytical laboratory, as appropriate. All samples were preserved and shipped at a temperature of approximately 4°Celsius (C) or less by application of ice prior to shipment to the analytical laboratory. This temperature was maintained during shipment by placing ice in zip-top bags above, around, and below the sample containers.

8.4 Documentation

Chain-of-custody forms were maintained throughout the sampling program to document sample acquisition, possession, and analysis. Chain-of-custody documentation accompanied all samples from the field to the laboratory. Each sample was assigned a unique identifier that was recorded in the field notes as well as on the chain-of-custody document.

9. Conceptual Site Model

GHD's conceptual understanding of the present conditions identified at AOI 6 and nearby proximity is summarized as follows.

9.1 Description and Site Use

- The Philadelphia Refinery is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania. The facility, which is located on industrial property, covers approximately 1,300 acres of land with access restricted by fencing and security measures. Current operations at the facility consist of the production of fuels and basic petrochemicals for the chemical industry.
- The area surrounding the facility is characterized by a mixture of residential, commercial, and industrial properties.
- AOI 6, also known as the Girard Point Chemicals Processing Area, encompasses approximately 100 acres and is located on the east side of the Schuylkill River. AOI 6 is a wedge-shaped property bordered by Lanier Avenue/AOI 3 to the east, Penrose Avenue

(Route 291)/Platt Memorial Bridge/AOI 5 to the south and Pennypacker Avenue/AOI 7 to the north (Figures 1 and 2).

- The entire western boundary of AOI 6 along the Schuylkill River is bound by a sheet pile wall.
- AOI 6 formerly contained numerous above ground storage tanks (ASTs) containing benzene, toluene, naphtha and other fuel stocks. A sulfuric acid plant was located along the northern boundary of the AOI. A gasoline treating unit, two reformer units, a BDDA (soap) unit, and a thermal hydro-dealkylation unit were also located in this area.
- AOI 6 currently consists of Udex and cumene units, reformer and associated naphtha hydrotreater, a diesel hydrotreater, tankage, boiler-houses and associated feed water treatment, maintenance buildings, lay-down yards, office buildings, the # 2 oil-water separator and remote Laboratory.
- There are two leaded tank bottom SWMUs (SWMU Nos. 92 and 95) located in AOI 6 that were addressed in several previous RCRA investigations as part of the EPA Corrective Action Process (CAP).

9.2 Geology and Hydrogeology

9.2.1 Geologic Framework

- The Philadelphia Refinery occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line".
- Beneath AOI 6, the following Coastal Plain deposits may be present, in order of increasing depth/age: apparent fill, Quaternary alluvium [including Holocene and Pleistocene (Trenton "gravel") deposits], and the Cretaceous Potomac-Raritan-Magothy (PRM) aquifer system lower sand unit.
- The PRM upper clay, upper sand, middle sand, and lower clay are interpreted to have been cut or laterally "pinch" out in AOI 6.

9.2.2 Unconfined (Water-Table) Aquifer

- Beneath AOI 6, the unconfined aquifer is primarily composed of saturated portions of unconsolidated materials primarily in the fill and alluvium, with lesser amount in the discontinuous Trenton "gravel".
- On average, the saturated thickness of the unconfined aquifer beneath AOI 6 is approximately 20 to 30 feet.
- No aquifer testing was identified in AOI 6. Evergreen is planning additional aquifer testing in AOI 4 as part of the facility wide fate and transport numerical model.
- Water-table mounds are apparent in AOI 6. These mounds are found immediately adjacent to the bulkhead portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. There is also an area of groundwater depression in the eastern and central portions of AOI 6. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours.

- Groundwater flows to the southwest towards the river. The gradient towards the southwest is 0.002 ft/ft. This pattern is consistent with the historical contours and supports that flow in AOI 6 is towards the river.

9.2.3 Lower Aquifer (Semi-Confined)

- Beneath AOI 6, the lower aquifer is primarily composed of saturated portions of the lower sand geologic unit.
- On average, the saturated thickness of the lower aquifer beneath AOI 6 is approximately 25 feet.
- Groundwater flow within the lower aquifer beneath AOI 6 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the southwest under a hydraulic gradient of approximately 0.0019 ft/ft.
- GHD evaluated the vertical hydraulic head gradients for the 2016 gauging events between the unconfined and lower aquifer throughout AOI 6. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2010 RIR and 2012 RIR).
- There is no available aquifer testing data for the lower aquifer at the facility. Evergreen is planning on conducting slug and hydraulic tests on the lower aquifer in AOI 4 in support off the facility wide fate and transport modeling. At the time of this RIR however, the best available k_h data for the lower aquifer is estimated from historical testing performed at the Philadelphia Naval Shipyard From those tests, values of lower sand k_h are estimated to vary from approximately 123 ft/d to 151 ft/d.

9.3 Compounds of Concerns

9.3.1 Soil

- Soil delineations were performed to the non-residential direct contact MSC for COCs on Table 1 and the numeric SSS (for lead), except along the bulkhead in AOI 6.
- Several soil samples collected during the 2016 site characterization activities exceeded the non-residential direct contact MSCs for lead and benzene and one sample for benzo(a)pyrene.

9.3.2 Groundwater

- Two rounds of characterization groundwater sampling were completed in 2016 in addition to other sampling in 2006 and 2012 as a part of this RIR and groundwater samples were analyzed for the COCs on Table 1.
- Concentrations of the following COCs were detected above the non-residential MSC in the water table aquifer during the 2016 groundwater sampling events: benzene, isopropyl benzene, toluene, 1,2,4-TMB, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead.

- None of the monitoring wells screened in the lower, semi-confined aquifer had exceedances of the non-residential groundwater MSCs.

9.3.3 Indoor/Ambient Air

- An indoor and outdoor air sampling events were conducted in March 2016 and March 2017 to represent ambient air and indoor air conditions during two heating seasons when levels of VOCs inside buildings are expected to be higher than during warmer months.
- Only one COC, benzene (in 6627 Building Control Room), was detected in an indoor samples above the PADEP VI screening criteria and the USEPA RSLs.

9.4 LNAPL Distribution and Mobility

- Numerous monitoring wells across AOI 6 have been gauged for LNAPL over the course of implementing the investigation and remediation programs. Stantec completed LNAPL and groundwater elevation gauging events in May 2016. During this event, 76 wells were gauged in the unconfined and semi-confined zones. LNAPL was detected in 21 wells with a maximum thickness of 4.27 feet at well B-116 during the May 2016 gauging.
- Based on evaluation of multiple lines of evidence, as presented in Appendix F (LNAPL Evaluation), LNAPL is largely present as hydraulically immobile and unrecoverable residual that is stable in overall extent. The fact that the 27 Pump House Total Fluids Recovery System has been off since September 20, 2010 and passive remediation was discontinued on January 26, 2015, with no perceived rebound in LNAPL thicknesses, also lends support to this assertion.
- A shown on Figure 16, during the May 2016 event there was three main areas with LNAPL detections:
  - LNAPL in wells B161, B-124, B-175 delineated by B-173 and B-125.
  - LNAPL in wells B-143, B-142, Sump-1, B-138 and B-147 delineated by B-126, B-138, B-141, B-134 and B-133.
  - LNAPL in wells B-150, B-149 and B-148 delineated by B-155, B-156, B-163and B-154.

  LNAPL was also detected in isolated wells B-130, URS-3, B-152, RW-9, U-3, and B-129 delineated by adjacent wells.

9.5 Qualitative Fate and Transport of Selected Compounds

- A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport assessment presented in this RIR. Rather, a qualitative-level assessment of groundwater data was warranted at this stage of the investigation.
- Of the COCs identified to be present in groundwater exceeding the non-residential MSC beneath AOI 6, the majority of the exceedances are for benzene as shown on Figure 19 which are associated, generally, with the occurrence of LNAPL which is immobile as discussed in Appendix F.

9.6 Potential Migration Pathways and Site Receptors

- AOI 6 encompasses approximately 100 acres and is located on the east side of the Schuylkill River and access is restricted by fencing and security measures.
- PES is responsible for overall facility security and oversight of contractor safety, and PES implements PPE and work plan/permitting protocols that mitigate the potential for worker exposure to impacted soil, groundwater, and/or LNAPL through the direct contact pathway.
- AOI 6 areas with identified soil exceedances of the direct-contact MSC for BaP and benzene, with the exception of BH-16-025, and SSS for lead have been delineated and remedies will be addressed in future Act 2 submissions, including a Facility-Wide Cleanup Plan. Additional delineation of benzene in BH-16-025 may be completed to support risk assessment or remedial activities.
- Concentrations of COCs identified through indoor and ambient air sampling met the PADEP indoor air criteria and the USEPA RSLs 1e-5 or HI of 0.1.
- Free-phase and residual LNAPL present beneath portions of AOI 6 appear to be contained within the property boundary and where present, of limited mobility.
- COCs are present in unconfined aquifer groundwater at concentrations above their respective SHS within AOI 6 and adjacent to the river.
- None of the COCs exceeded the groundwater MSCs in the lower aquifer.
- The Schuylkill River is adjacent to, AOI 6 but the bulkhead separates the water table aquifer and the river. The unconfined aquifer is not utilized for municipal or nearby communal, potable water supply in south Philadelphia. Results of the potable well search are presented in Appendix M.

10. Qualitative Fate and Transport Assessment

On September 28, 2015, Evergreen's team of consultants met jointly with the PADEP to discuss the groundwater fate and transport modeling approach under Act 2 at the Philadelphia Refining Complex. At that time, it was collaboratively decided that individual AOI RIR submissions would include qualitative assessments of contaminant fate and transport, including an evaluation of plume stability, COC trends, and potential impacts to surface water. Findings and conclusions of the AOI-specific, qualitative assessments of fate and transport will ultimately be used in a calibrated, steady-state MODFLOW model to perform quantitative fate and transport, including predictive simulations that will address cumulative mass loading to potential receptors.

The following discussion qualitatively summarizes factors that may influence contaminant fate and transport at AOI of the facility.

10.1 Geologic Framework

As discussed in detail in Sections 2 and 5 of this report, the geologic framework present beneath and in close proximity to AOI 1 can be summarized as follows:

- The Philadelphia Refinery occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line".
- Beneath AOI 6, the following Coastal Plain deposits may be present, in order of increasing depth/age: apparent fill, Quaternary alluvium [including Holocene and Pleistocene (Trenton "gravel") deposits], and the Cretaceous Potomac-Raritan-Magothy (PRM) aquifer system lower sand unit.
- The PRM upper clay, upper sand, middle sand, and lower clay are interpreted to have been cut or laterally "pinch" out in AOI 6.

10.2 Hydrogeology

As summarized above and discussed in detail in Section 5 of this report, the geologic framework present beneath and in close proximity to AOI 6 supports the following hydrogeologic conditions:

- Two aquifers have been identified beneath the Philadelphia Refinery. In general, these are the water-table (unconfined) and a lower aquifer. Their properties are as follows.

10.2.1 Unconfined (Water-Table) Aquifer

- Beneath AOI 6, the unconfined aquifer is primarily composed of saturated portions of unconsolidated materials primarily in the fill and alluvium, with lesser amount in the discontinuous Trenton "gravel".
- On average, the saturated thickness of the unconfined aquifer beneath AOI 6 is approximately 20 to 30 feet.
- No aquifer testing was identified in AOI 6. Evergreen is planning additional aquifer testing in AOI 4 as part of the facility-wide fate and transport numerical model.
- Water-table mounds are apparent in AOI 6. These mounds are found immediately adjacent to the bulkhead. Groundwater depressions are found in the eastern and central portion of AOI 6.
- Groundwater flows southwest towards the river with a gradient of 0.002 ft/ft. This pattern is consistent with the historical contours and supports that flow in AOI 6 is towards the river.

10.2.2 Lower Aquifer (Semi-Confined)

- Beneath AOI 6, the lower aquifer is primarily composed of saturated portions of the lower sand geologic unit.
- On average, the saturated thickness of the lower aquifer beneath AOI 6 is approximately 25 feet.
- Groundwater flow within the lower aquifer beneath AOI 6 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces are shown on Figure 15 for

synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the southwest under a hydraulic gradient of approximately 0.002 ft/ft.

- GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 6. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2006 SCR and 2012 RIR).
- There is no available aquifer testing data for the lower aquifer at the facility. Evergreen is planning on conducting slug and hydraulic tests on the lower aquifer in AOI 4 in support off the facility wide fate and transport modeling. At the time of this RIR however, the best available k_h data for the lower aquifer is estimated from historical testing performed at the Philadelphia Naval Shipyard From those tests, values of lower sand k_h are estimated to vary from approximately 123 ft/d to 151 ft/d.

10.3 Hydrogeology and Topography

- LiDAR data collected in 2010 indicates that present-day topography is relatively flat within AOI 6 and proximity, where land surface elevations generally range from approximately 60 feet to just over 75 feet NAVD 88.
- Within AOI 6, much of the surface area present is impervious or assumed to be of limited permeability.
- The Schuylkill River is directly adjacent to AOI 6.
- National Weather Service Online Weather Data (NOWData) for Philadelphia, Pennsylvania, indicates that since 1872, mean annual precipitation is approximately 42 inches (ranging from approximately 29 to 64 inches).
- Stormwater runoff within AOI 6 is managed by an onsite storm sewer system that is sent to the facility's Girard Point Wastewater Treatment Plant.
- Natural recharge of the unconfined aquifer beneath AOI 6 and proximity is assumed to be spatially variable but limited in overall capacity as a result of: the high percentage of impervious surface coverage present; and, the fine-grained nature and extent of recent alluvial deposits above the water table.

10.4 Anthropogenic Features

10.4.1 Historic Fill

Apparent fill is present beneath the existing land surface at most locations in AOI 6 and has been identified to be approximately 10 feet. The fill is generally heterogeneous in nature and is composed of an admixture of sand and gravel, mud, and anthropogenic debris included cinders, ash, bricks, cinder block, and metal.

10.4.2 Former Remediation Systems

The 27 Pump House Total Fluids Recovery System was turned off September 20, 2010 due to absence of recoverable product. Passive remediation began on October 10, 2010 with the installation of absorbent socks in wells B-124, B-132, B-137, B-139, B-142, B-143, and B-147. These wells were gauged on a quarterly basis and any detected LNAPL was passively recovered and transferred to the system holding tank. Based on limited recoverable LNAPL in the proximal wells, passive remediation was discontinued on January 26, 2015. A summary of the remediation systems is presented in Appendix G.

10.5 Groundwater Constituents of Concern

10.5.1 Unconfined (Water Table) Aquifer

Concentrations of the following COCs were detected above the groundwater MSCs in unconfined aquifer groundwater during the 2016 characterization sampling events; benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead. These results are consistent with historic sampling for COCs that have been previously analyzed in AOI 6.

The areas that are not proposed to be evaluated for remedial action in the Cleanup Plan have very low levels of semi-volatile compounds and are delineated by other monitoring wells or the bulkhead. These compounds will be evaluated by the site-wide Fate and Transport modeling.

10.5.2 Lower Aquifer

No concentrations of COCs were detected above the groundwater MSCs in lower aquifer groundwater during 2016 characterization sampling events. This is consistent with the results from previous sampling events.

10.6 Potential Onsite and Offsite Receptors

Based on the identified impacts to groundwater at AOI 6, GHD has evaluated the following as potential receptors:

- Vapor intrusion effecting potential occupants of buildings in AOI 6 was evaluated. The results did not exceed the PADEP VI screening levels with the exception of one detection of benzene.
- The Schuylkill River could receive AOI 6 groundwater discharging to the river. Although the bulkhead will limit migration of the groundwater from AOI 6 to the river.
- Potable consumption of impacted groundwater could affect human health. No known potable supply wells exist at or in proximity to AOI 6. Results of the potable well search are presented in Appendix M.
- The PRM aquifer system is heavily utilized for water supply in New Jersey. The aquifers of that system, chiefly the lower sand unit, receive recharge via vertical leakage through confining units and direct recharge from younger deposits along their subcrop area in south Philadelphia. None of the COCs were above the groundwater MSCs in the lower Aquifer in AOI 6.

10.7 Plans for Quantitative Fate and Transport Analysis

Stantec is presently developing a site-wide groundwater flow model using the USGS MODFLOW2000 computer code and Groundwater Vistas Version 6 software. The MT3DMS contaminant transport module will be utilized to simulate predictive scenarios of the fate and transport of selected COCs in groundwater. The modeling is being performed to meet and demonstrate compliance with the PADEP Site-Specific Standard for remediation of pre-existing contamination under Act 2, Pennsylvania's Land Recycling Program. Under Act 2 and in consideration of the One Cleanup Program, an analysis of the fate and transport of petroleum-related constituents is needed, in general, to assess risk to potential receptors, assess plume stability, and estimate time to project closure.

The site-wide flow model will focus on groundwater movement within the Coastal Plain of south Philadelphia, Pennsylvania, near the Philadelphia Refinery. The model domain was adopted from an earlier USGS model developed by Schreffler (2001), later updated by Sloto (2012), and has been updated by Stantec to more-closely simulate site-specific groundwater flow conditions beneath the facility. Updates to the Schreffler (2001) model have included model layer refinement, grid discretization, updates to the model layer hydraulic properties using site-specific testing data, and the inclusion of drains to simulate losses to the sewers and/or localized pumping centers (e.g., Mingo Creek Pump Station). It is anticipated that Stantec will present the site-wide flow model to PADEP for comment prior to utilization of the model in any fate and transport analyses at the refinery in support of a facility-wide Cleanup Plan, or a site-wide RIR to address cumulative loading of COCs to receptors.

11. Ecological Assessment

The majority of AOI 6 is covered with soil, gravel, and impervious surfaces. The soil and gravel-covered portions of AOI 6 are not likely to serve as a breeding area, migratory stopover, or primary habitat for wildlife. On September 23, 2016, a survey of endangered, threatened, and special concern wildlife and habitat was conducted by submitting a search request through the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Tool. The results of the PNDI search identified no known impacts by the PA Game Commission, the PA Department of Conservation and Natural Resources, and the U.S. Fish and Wildlife Service.

The PNDI search identified potential endangered and threatened species impacts that required further review by the PA Fish and Boat Commission. A no effect letter request was submitted to the PFBC on October 22, 2016. A response was received from the PFBC on November 3, 2016 indicating that no impact is anticipated to the species of special concern. Evergreen intends on completing a habitat assessment to document habitat types present and adjoining AOI 6 and the suitability of these habitats to support species of concern based on the results of the PNDI search even though a no effect letter was received from the PFBC. Evergreen will complete these assessments in accordance with PA Chapter 250.311 and the Pennsylvania Technical Guidance Manual (TGM) by a qualified biologist. The results of this assessment will be included in a future submittal. All ecological assessment documentation is included in Appendix I.

12. Community Relations Activities

A Community Relation Plan (CRP) that includes public involvement with local residents to inform them of the anticipated investigations and remediation activities was completed as part of the original NIR submittal in 2006. A revised NIR was submitted in 2014. The purpose of the CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens to be informed of on-site activities related to the investigation activities at the Site. This plan incorporates aspects of public involvement under both PADEP's Act 2 program and USEPA's RCRA Corrective Action program. This report and future Act 2 reports will include the appropriate municipal and public notices in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in a local newspaper. As part of the CRP, Evergreen has held an initial public meeting in the City of Philadelphia to present the strategy and give status updates of the project at the CRP meeting on an as requested basis. A copy of the original NIR, the 2014 NIR and the Act 2 report notifications for this RIR are included in Appendix A.

13. Conclusions and Recommendations

GHD has prepared this RIR for AOI 6 of the Philadelphia Refinery Complex to satisfy the requirements of Act 2, as specified under 25 PA Code §250.408. The documented investigation activities were performed in general accordance with a 2011 revised Work Plan for Site-wide Approach Under the One Cleanup Program, and were conducted in support of Evergreen's commitment to remediate legacy environmental impacts that existed at the facility prior to its conveyance to PES in 2012 (Buyer-Seller Agreement). In support of those stated objectives, this report has described a comprehensive evaluation of available historical data pertaining to AOI 6, and has documented a remedial investigation strategy that included the collection of a significant amount of additional subsurface information in the time since previous AOI 6 Act 2 deliverables were submitted to PADEP (2013 SCR/RIR). Investigations performed as a part of this report also considered and where relevant, sought to address PADEP comments directed towards previous RIR submissions for the facility.

The following summarizes the conclusions and recommendations regarding AOI 6.

13.1 Soil

Some historical samples had exceedances of the direct-contact MSC for, BaP, lead and benzene. These historical samples have been delineated.

Limited soil samples collected in 2016 exceeded the numeric SSS for lead, the NRDC for benzene and BaP. Additional sampling may be completed to support site-wide Risk Assessment or site-wide Cleanup Plan Reports to delineate benzene in the vicinity of AOI 6-16-025.

13.2 Groundwater

13.2.1 Unconfined (Water-Table) Aquifer

Benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead exceeded the current non-residential MSCs in the unconfined aquifer.

The concentrations of COCs exceeding the MSCs in the unconfined aquifer have generally been delineated. The following wells have groundwater MSC exceedances but are not explicitly delineated by other wells with concentrations below MSCs: B-39, B-43, B-169, U-4, and URS-5. These wells are located near the bulkhead and do not have any wells that can delineate these concentrations.

13.2.2 Lower Aquifer

None of the samples in the lower aquifer exceeded the non-residential MSCs, which is consistent with historic data in AOI 6 therefore no further assessment was completed for the Lower Aquifer in this RIR. As indicated above for the unconfined aquifer, a MODFLOW model will be utilized during quantitative fate and transport analyses to evaluate the Lower Aquifer for the facility.

13.3 Vapor Intrusion

Concentrations of COCs in indoor and outdoor ambient air were evaluated in the ten occupied buildings in AOI 6 where the vapor intrusion pathway is potentially complete. There were no exceedances of the PADEP VI criteria except IA-AOI6-6627 (Building 6627 Control Room), which exceeded for benzene. Evergreen is intending to complete an addition round of indoor air sampling within AOI 6. Results of the additional sampling event will be reported to PADEP in a future Act 2 deliverable. Indoor air concentrations in exceedance of the indoor air screening criteria will be addressed in a site-wide risk assessment or remedial activities as presented in the site-wide Risk Assessment report or site-wide Cleanup Plan.

13.4 LNAPL

LNAPL within AOI 6 has been delineated, except in areas along the bulkhead where delineation is not possible. The majority of LNAPL sampled was categorized as a light to middle distillates. LNAPL recovery has been suspended due to poor recovery and immobility of the LNAPL.

14. References

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Pennsylvania Department of Environmental Protection, Land Recycling Program (2013). Statewide Health Standards, Table 3a – Medium-Specific Concentrations (MSCs) For Organic Regulated Substances In Soil: Direct Contact Numeric Values. http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/20541/statewide_health_standards/1034862.

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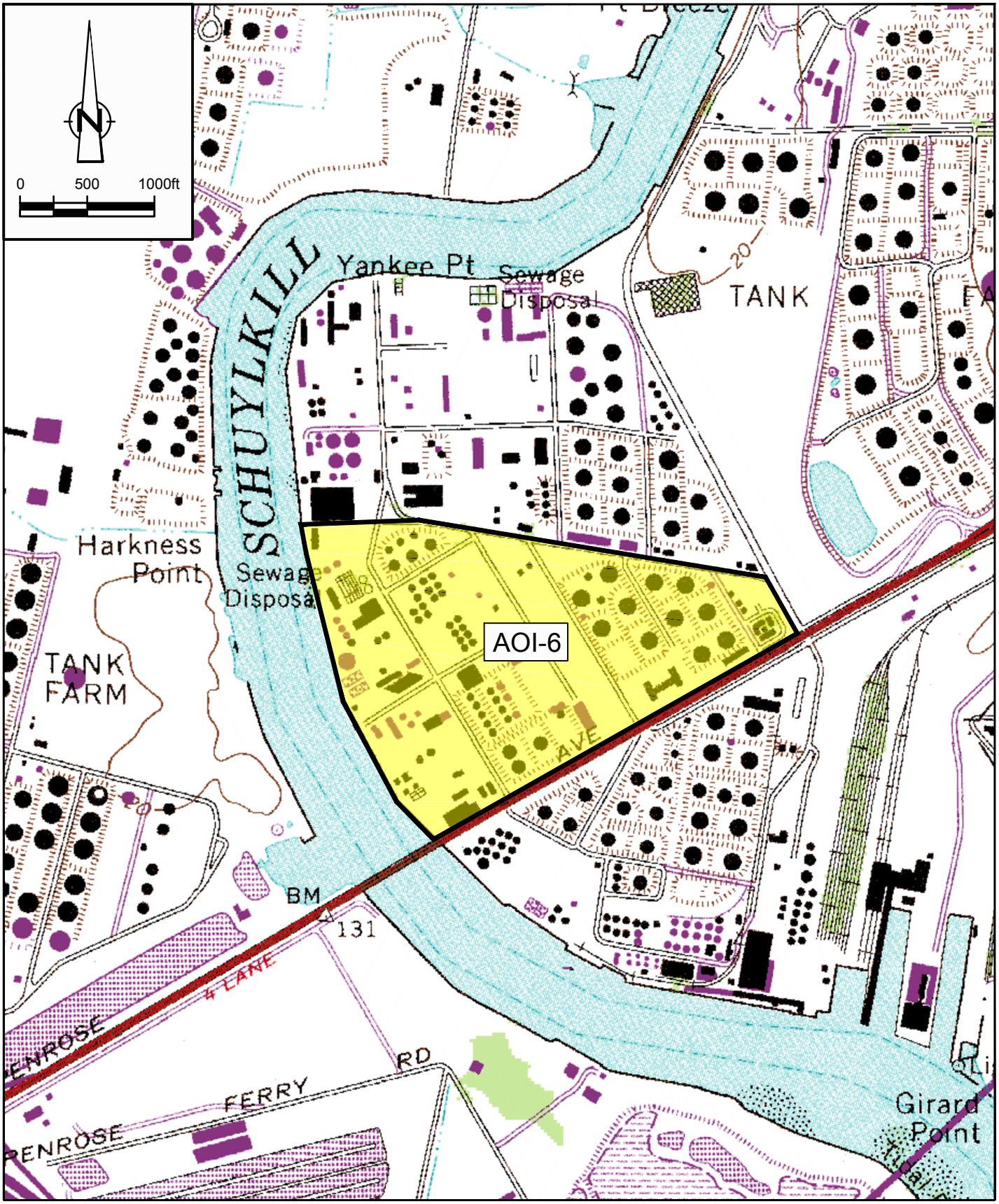

SOURCE: USGS QUADRANGLE MAP, PHILADELPHIA, PENNSYLVANIA, 1995

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SITE LOCATION MAP

FIGURE 1

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA001.DWG

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Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation

0 150 300 450
Feet

Coordinate System:
NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Legend

- 2016 RI Groundwater Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Piezometer
- 2016 RI Soil Sample
- 2017 RI Soil Sample
- Historical Soil Sample
- 2016 RI (Not Sampled)
- 2016 RI (Attempted Sample Location)
- Air Sample
- Bulkhead
- Tank
- Tank Addressed in SCR/RACR 2017
- Solid Waste Management Unit
- Area Of Interest

Original Size
ANSI D

Bar is one inch on original size drawing
0 1"

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Date: Nov 20, 2017

EVERGREEN RESOURCES MANAGEMENT
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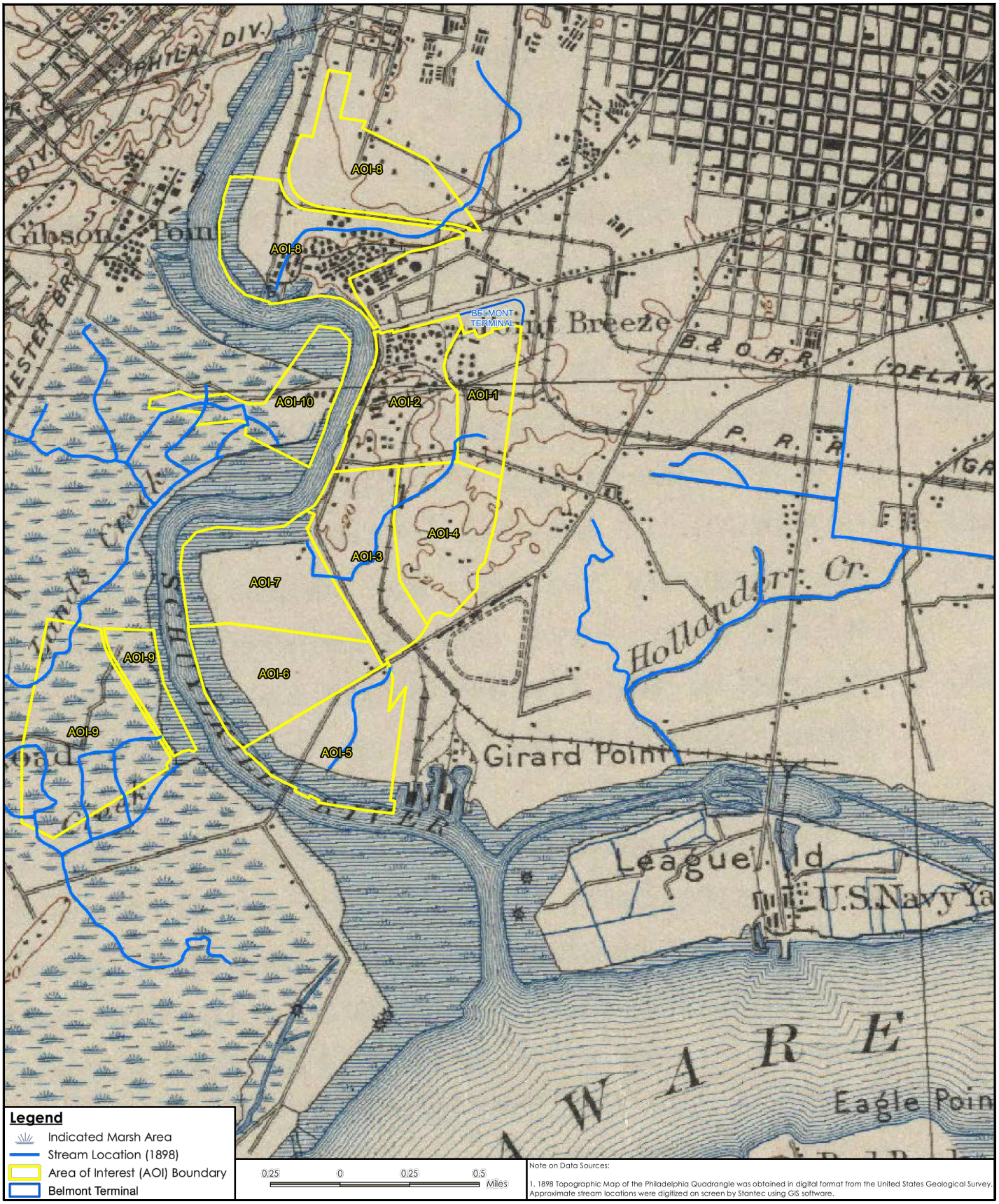
AOI 6 SITE PLAN

Figure No.

FIGURE 2

GIS File: Q:\GIS\PROJECTS\11109000s\11109613\Layouts\002\11109613-00(002)GIS-OT002.mxd



SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

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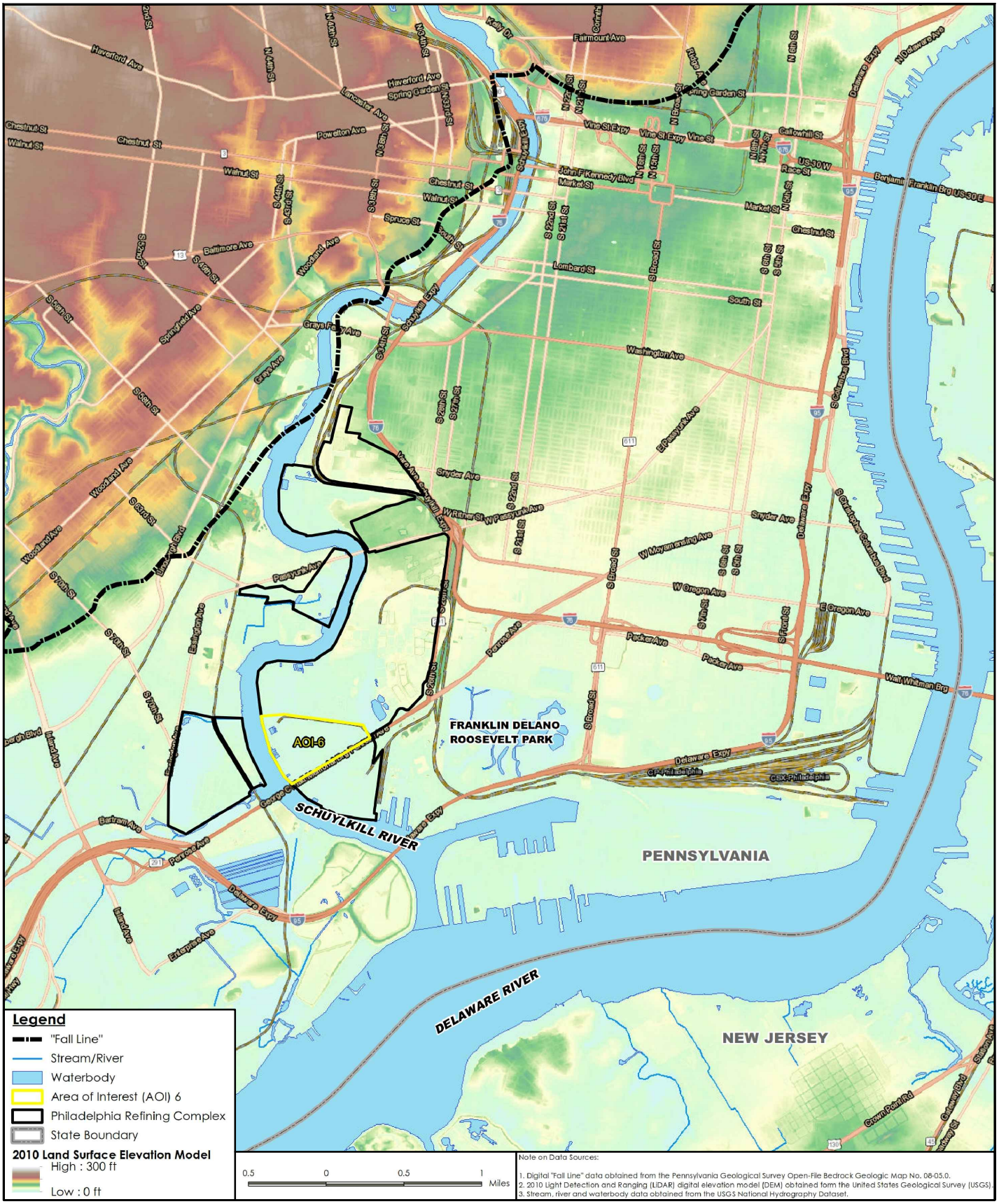
HISTORIC STREAM AND MARSH LOCATIONS (CIRCA 1898)

FIGURE 3

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA002.DWG



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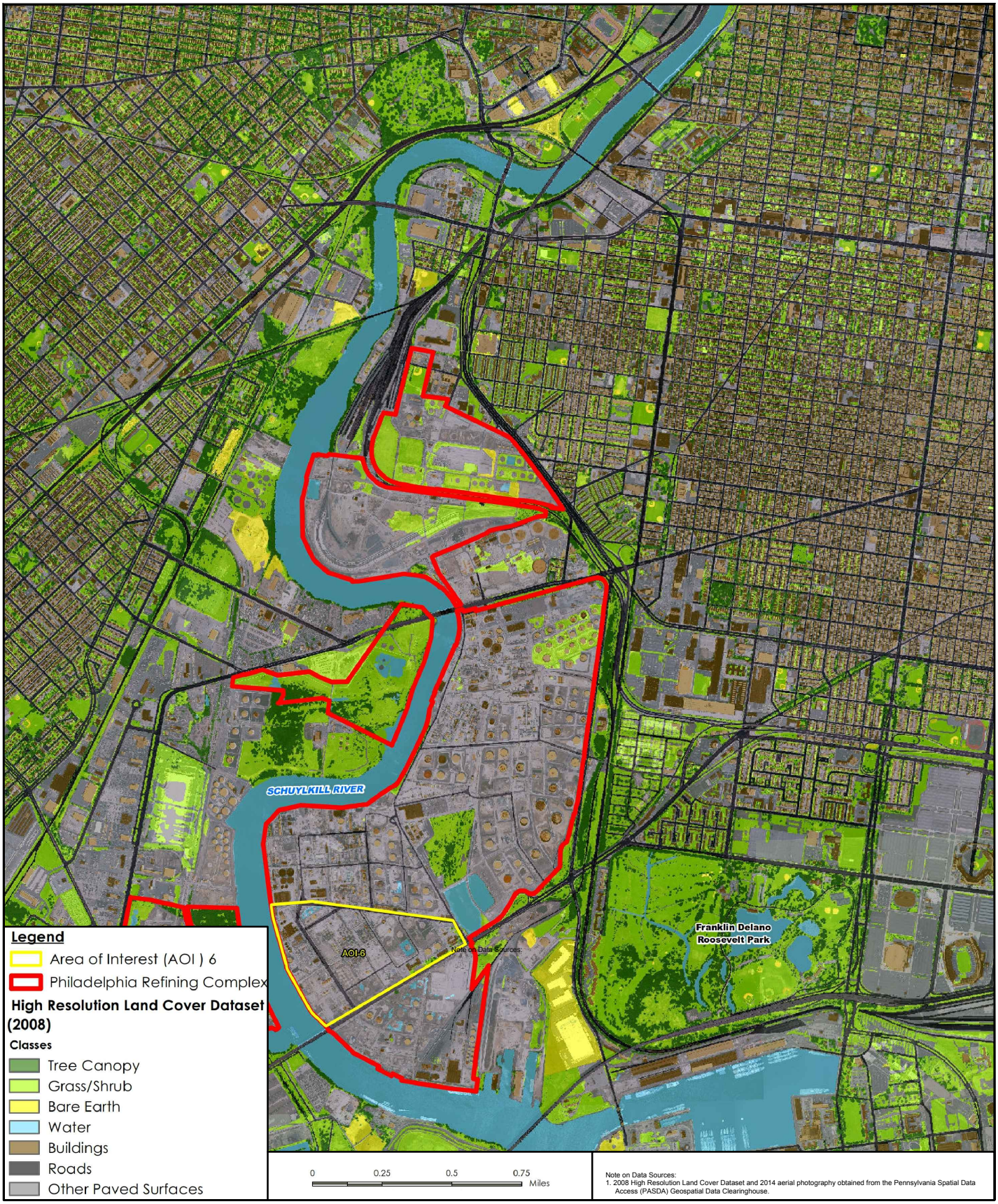
GEOGRAPHIC SETTING

FIGURE 4

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA003.DWG



SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

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HIGH RESOLUTION LAND COVER DATASET (2008) - CITY OF PHILADELPHIA

FIGURE 5

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA004.DWG

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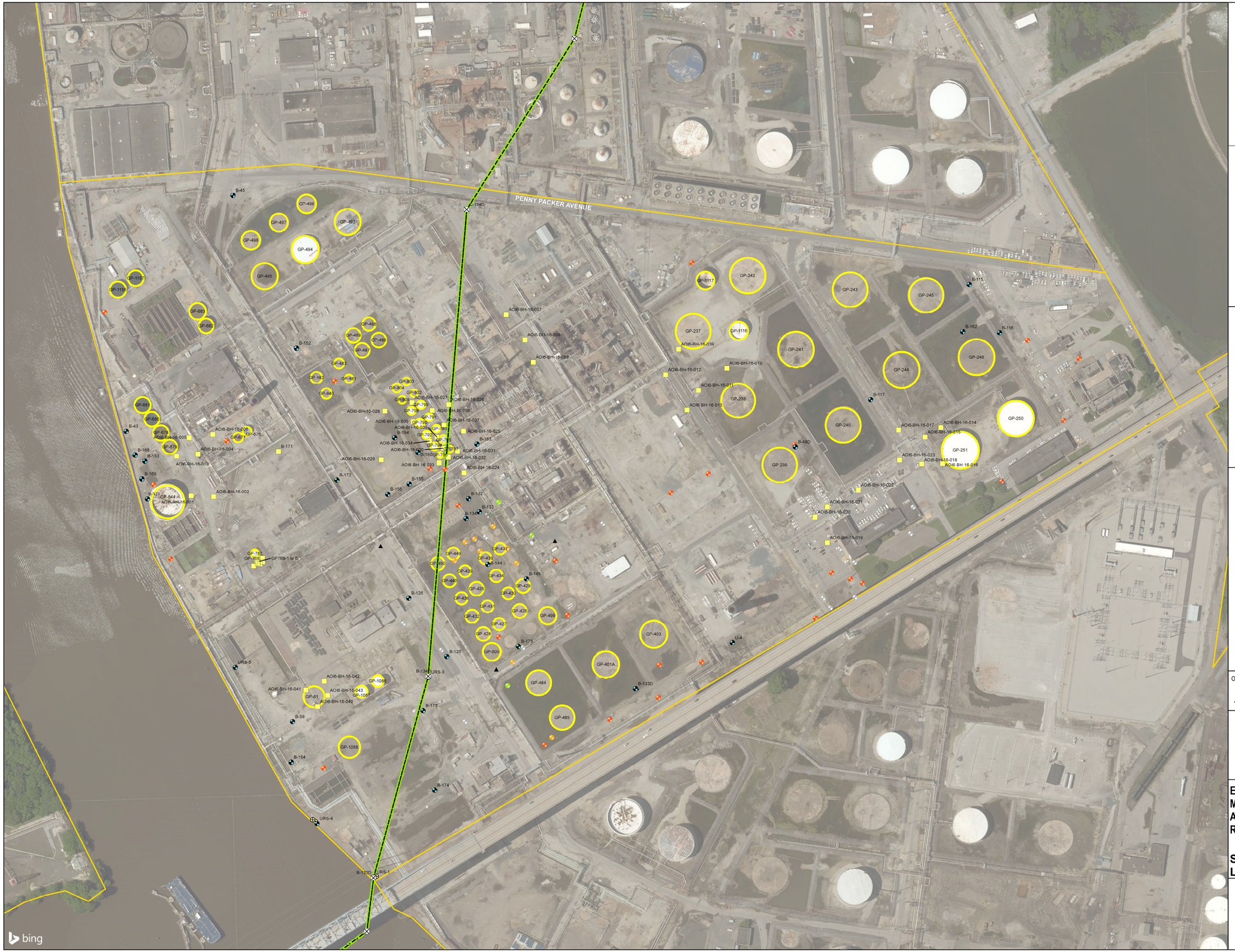
GENERALIZED BEDROCK GEOLOGIC MAP

FIGURE 6

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA005.DWG



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0 150 300 450
Feet

Coordinate System:
NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Legend

- Stratigraphic Profile Boring Location
- 2016 RI Groundwater Sample
- 2016 RI Soil Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Piezometer
- Tank
- Stratigraphic Profile Location
- Area Of Interest

Original Size
ANSI D

Bar is one inch on original size drawing
0 1"

Project : 11109614

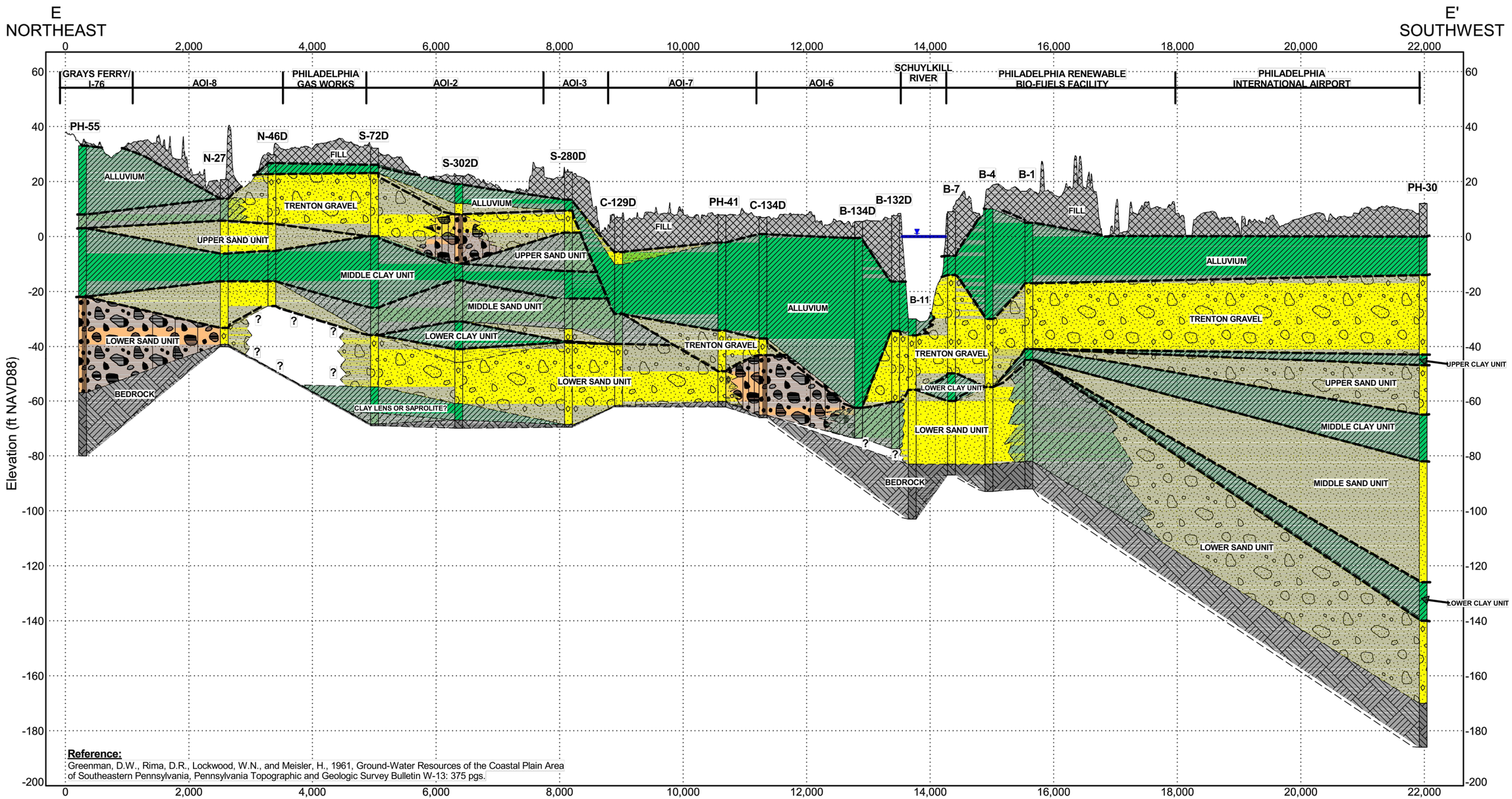
Date: Nov 20, 2017

EVERGREEN RESOURCES MANAGEMENT
AOI-6 PHILADELPHIA REFINERY OPERATIONS

STRATIGRAPHIC PROFILE LOCATION MAP

Figure No.

FIGURE 7



SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.

GENERALIZED LITHOLOGY GRAPHICS

- Fill
- Sand (incl. trace to little silt/clay/gravel)
- Mud
- Sandy Gravel
- Muddy Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Sand with Lignite

Notes:

1. Land surface profile obtained from a 2010 light detection and ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-55, PH-41, B-11, B-7, B-4, B-1 and PH-30 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those historic borings were estimated by Stantec in a GIS using a georeferenced image of Plate 1 of that report. Fill thicknesses interpreted by Stantec
3. PH-55 terminal boring depth deeper than shown.
4. Water depths for the Schuylkill River were estimated using soundings provided on the National Oceanic and Atmospheric Administration (NOAA) navigation chart for the Delaware River, Philadelphia and Camden Waterfronts (Chart 12313). Mean lower low water (MLLW) depths were transformed to the North American Vertical Datum of 1988 (NAVD 88).
5. Stantec generalized lithologic data from available borehole logs into 8 categories as indicated for interpretive purposes.
6. Correlation between lithologies and, where applicable, geologic units is based on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile. Contacts dashed where inferred.
7. Vertical Exaggeration ~ 45 X

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Dec 1, 2016

STRATIGRAPHIC PROFILE

FIGURE 8

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA011.DWG

SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

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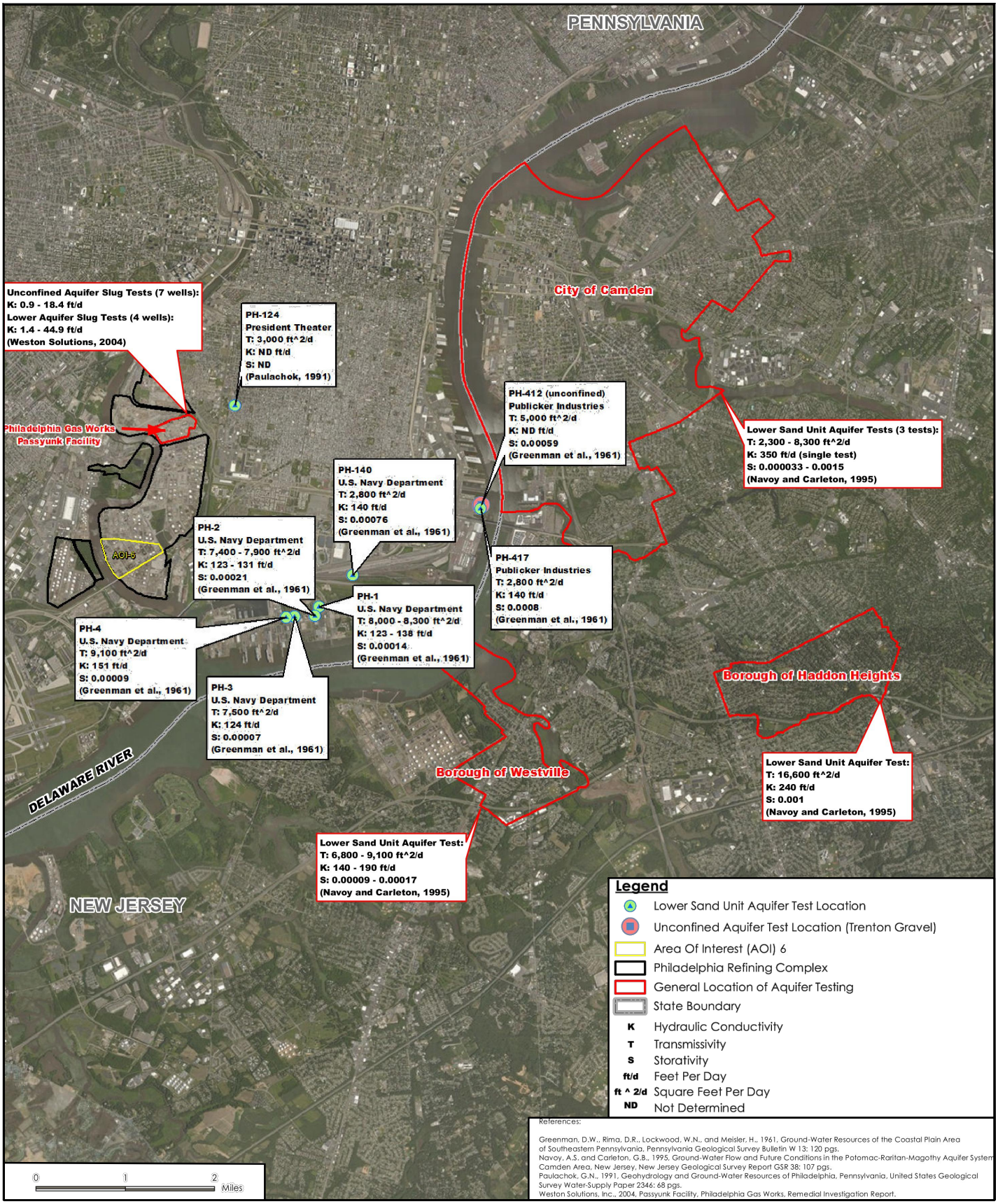
Jan 19, 2017

SUMMARY OF AVAILABLE AQUIFER TESTING DATA FOR THE UNCONFINED AQUIFER

FIGURE 9

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA006.DWG



SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

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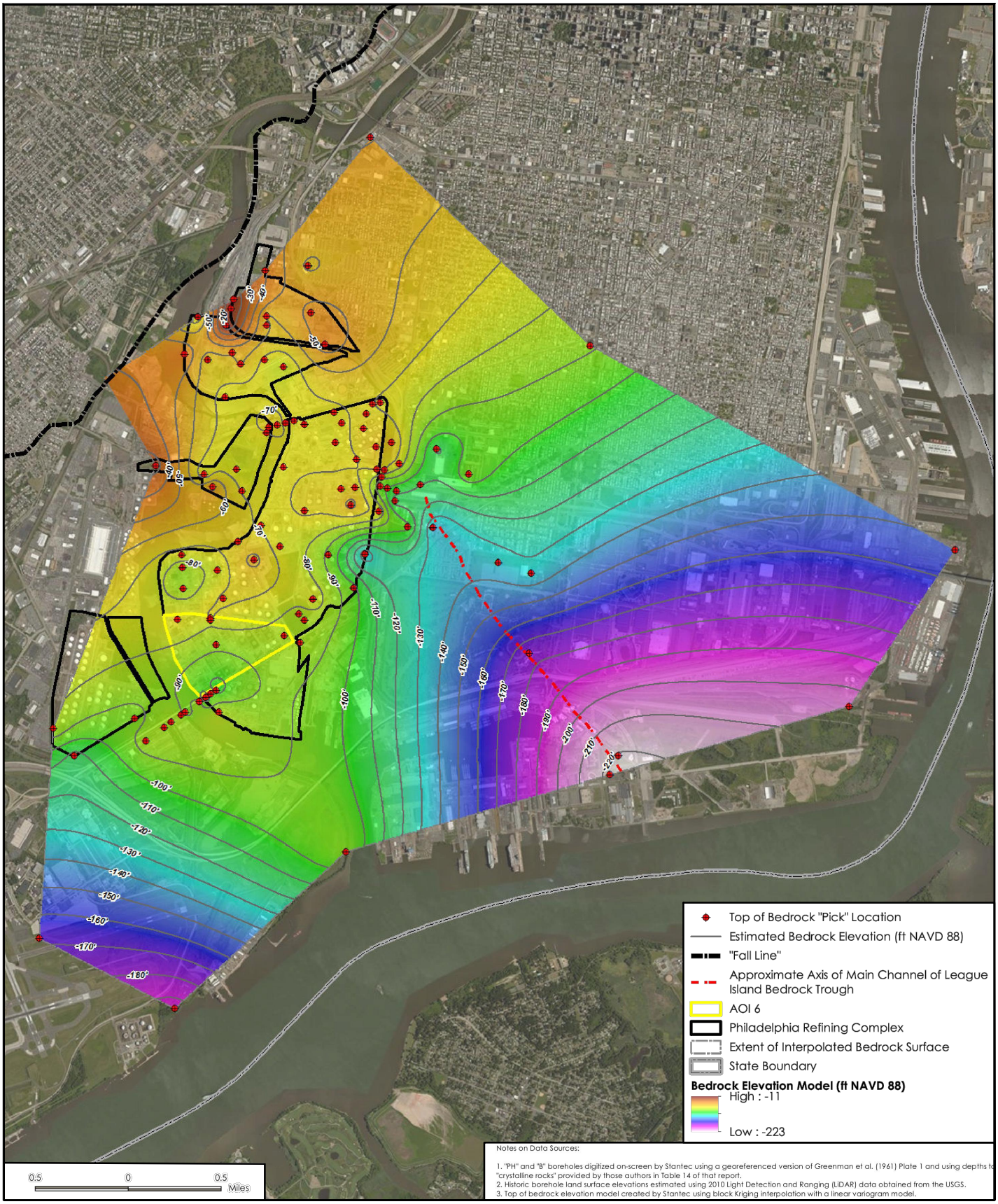
11109613-01

Jan 19, 2017

SUMMARY OF PUBLISHED AQUIFER TESTING DATA FOR THE UNCONFINED AND LOWER AQUIFERS

FIGURE 10

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA007.DWG



SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

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REMEDIAL INVESTIGATION REPORT

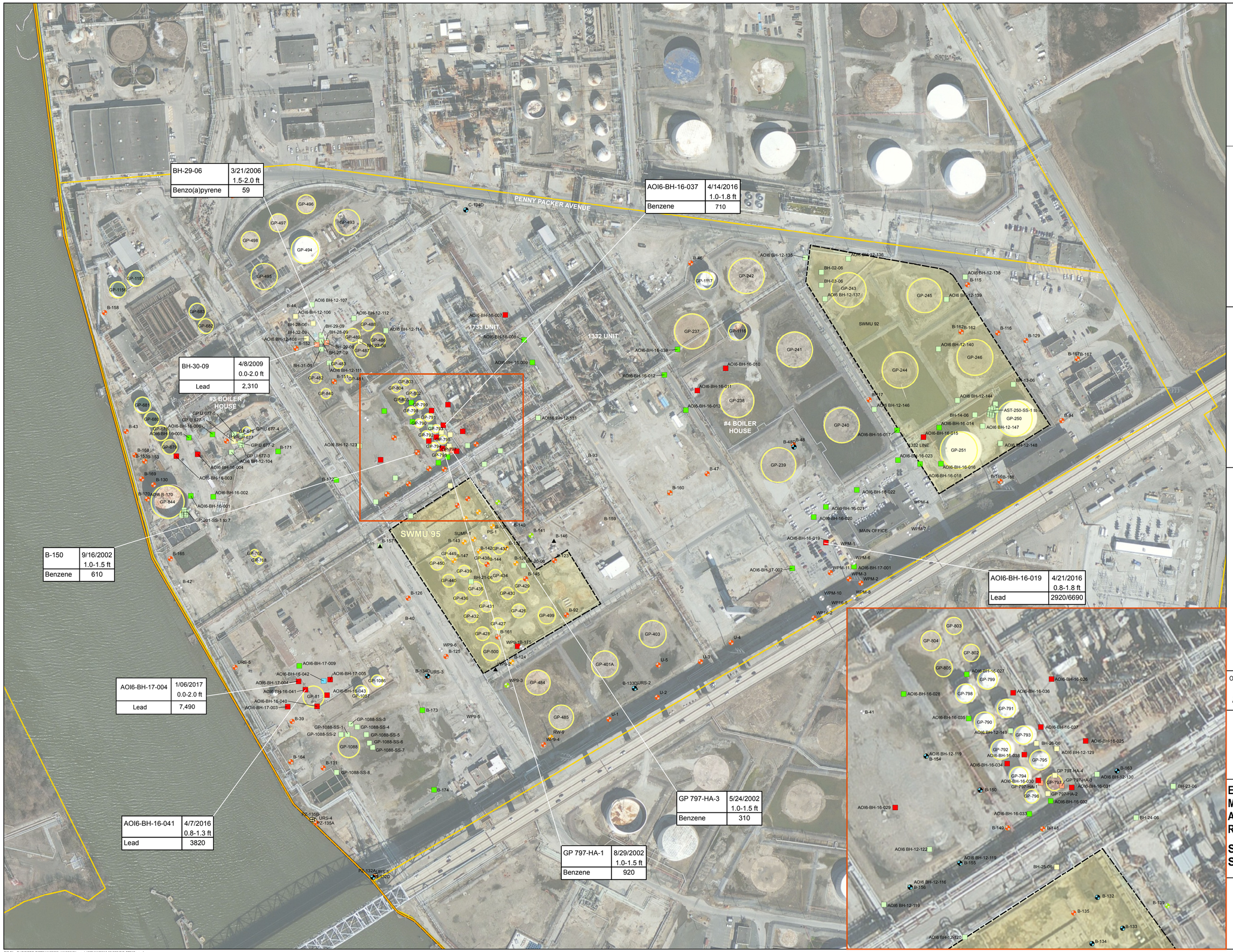
11109613-01

Jan 19, 2017

BEDROCK STRUCTURE CONTOUR MAP - TOP OF BEDROCK

FIGURE 11

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA008.DWG



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1. MSC is PADEP-non-residential medium specific criteria.
2. Data in boxes represent soil concentrations in excess of PADEP direct contact criteria MSC.

Source: Aerial: USDA FSA NAIP August 2015

0 150 300 450
Feet

Coordinate System:
NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Legend

- 2016 RI Soil Sample (Exceeded MSC) or the SSS for Lead
- 2016 RI Soil Sample (Did Not Exceed MSC)
- 2016 RI (Attempted Sample Location)
- Historical Soil Sample (Exceeded Direct Contact)
- Historical Soil Sample (Exceeded MSC)
- Historical Soil Sample (Did Not Exceed MSC)
- 2016 RI Groundwater Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Piezometer
- Bulkhead
- Tank
- Solid Waste Management Unit
- Area Of Interest

Original Size: **ANSI D**

Bar is one inch on original size drawing: 0 — 1"

Project : 11109613

Date: Nov 21, 2017

EVERGREEN RESOURCES MANAGEMENT
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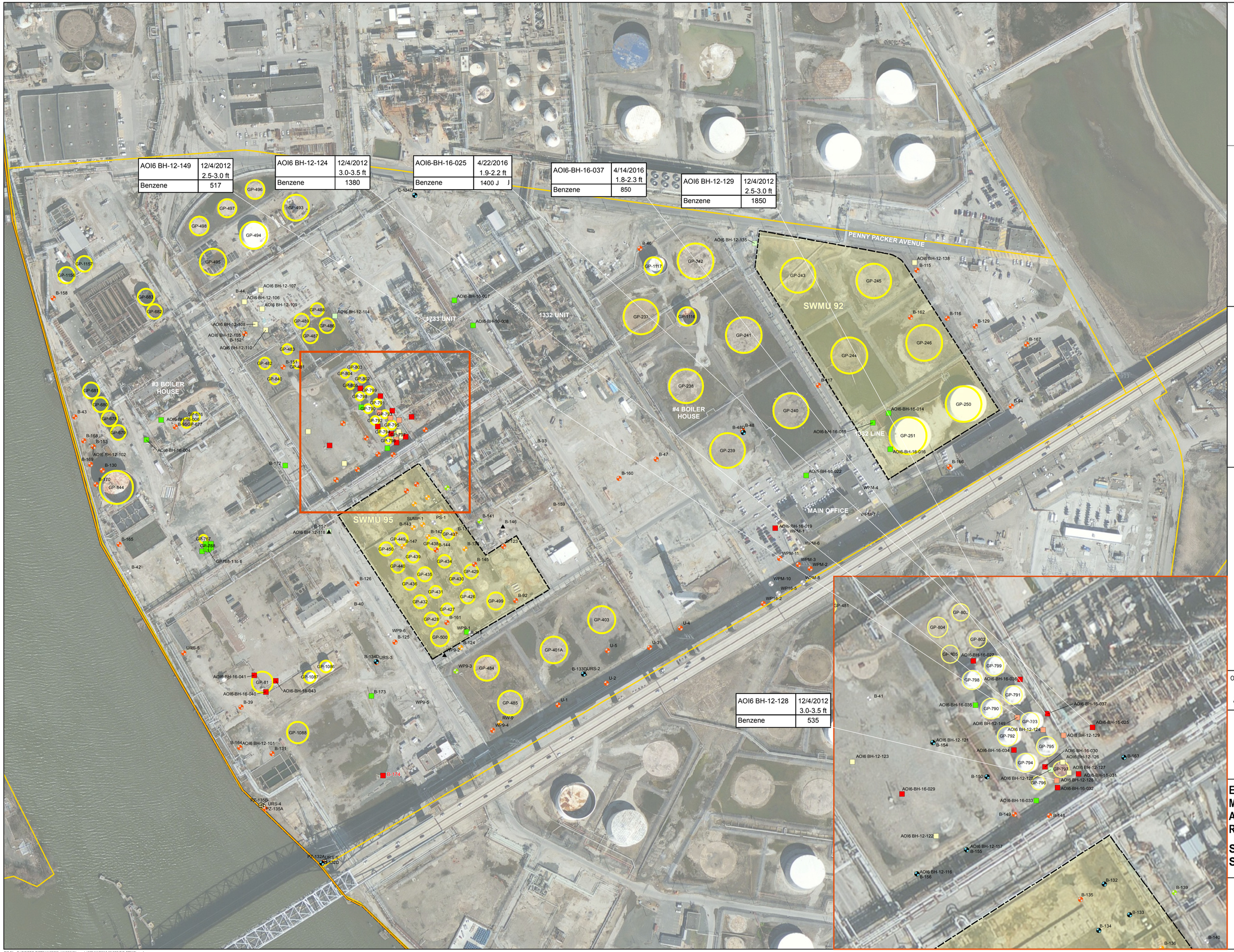
SURFACE SOIL SAMPLE RESULTS

Figure No.

FIGURE 12a

GIS File: Q:\GIS\PROJECTS\11109600s\11109613\Layouts\002\11109613-00(002)GIS-OT012a.mxd



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Source: Aerial: USDA FSA NAIP August 2015

0 150 300 450
Feet

Coordinate System:
NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Legend

- 2016 RI Soil Sample (Exceeded MSC)
- 2016 RI Soil Sample (Did Not Exceed MSC)
- 2016 RI Groundwater Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Piezometer
- Bulkhead
- Tank
- Solid Waste Management Unit
- Area Of Interest

1. MSC is PADEP-non-residential medium specific criteria.
2. Data in boxes represent soil concentrations in excess of PADEP direct contact criteria MSC.

Original Size
ANSI D

Bar is one inch on original size drawing
0 1"

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EVERGREEN RESOURCES MANAGEMENT
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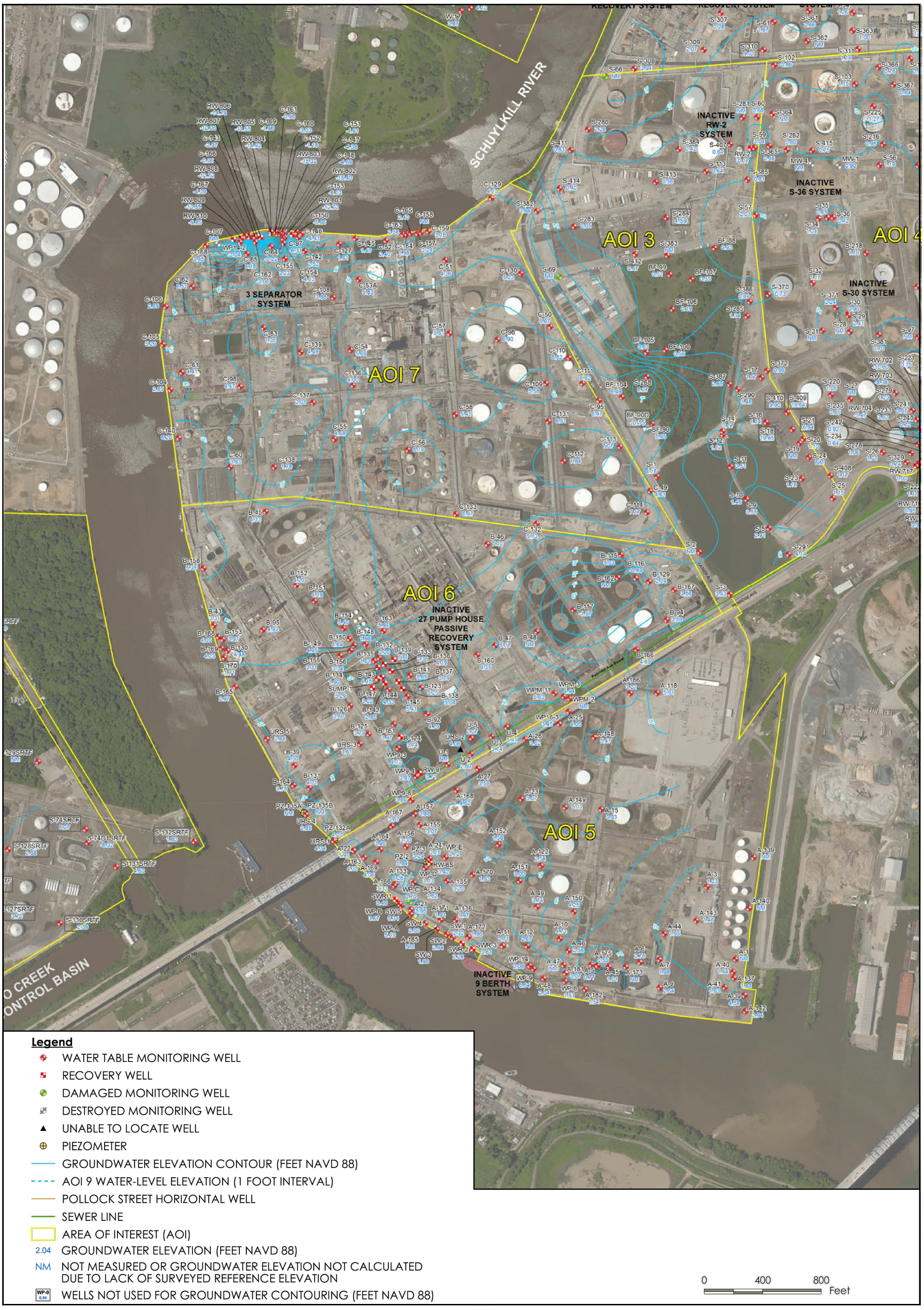
SUB-SURFACE SOIL SAMPLE RESULTS

Figure No.

FIGURE 12b

GIS File: Q:\GIS\PROJECTS\11109000\e\11109613\Layouts\002\11109613-00(002)GIS-OT012b.mxd



SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.

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STANTEC WATER TABLE GROUNDWATER ELEVATION MAP, MAY 2016

FIGURE 13

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA009.DWG

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date June 2014, Accessed: 2017

0 100 300ft

LEGEND

- B-39 SAMPLE LOCATION
- 3.40 WATER TABLE ELEVATION (ft. AMSL)
- 0.0 WATER TABLE CONTOUR (ft. AMSL)

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WATER TABLE CONTOURS
MAY 2, 2016

11109613-01
Nov 11, 2017

FIGURE 14

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA017.dwg

SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.

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STANTEC DEEP GROUNDWATER ELEVATION MAP, MAY 2016

11109613-01
Nov 11, 2017

FIGURE 15

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA010.DWG

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date June 2014, Accessed: 2017

0 100 300ft

LEGEND

B-174 SAMPLE LOCATION

0.00 LNAPL APPARENT THICKNESS (ft.)

LNAPL PRESENT

GHD

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LNAPL APPARENT THICKNESS
MAY 2, 2016

11109613-01
Nov 11, 2017

FIGURE 16

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA016.dwg

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date June 2014, Accessed: 2017

0 100 300ft

LEGEND

- B-174 SAMPLE LOCATION
- 0.00 LNAPL APPARENT THICKNESS (ft.)
- LNAPL PRESENT

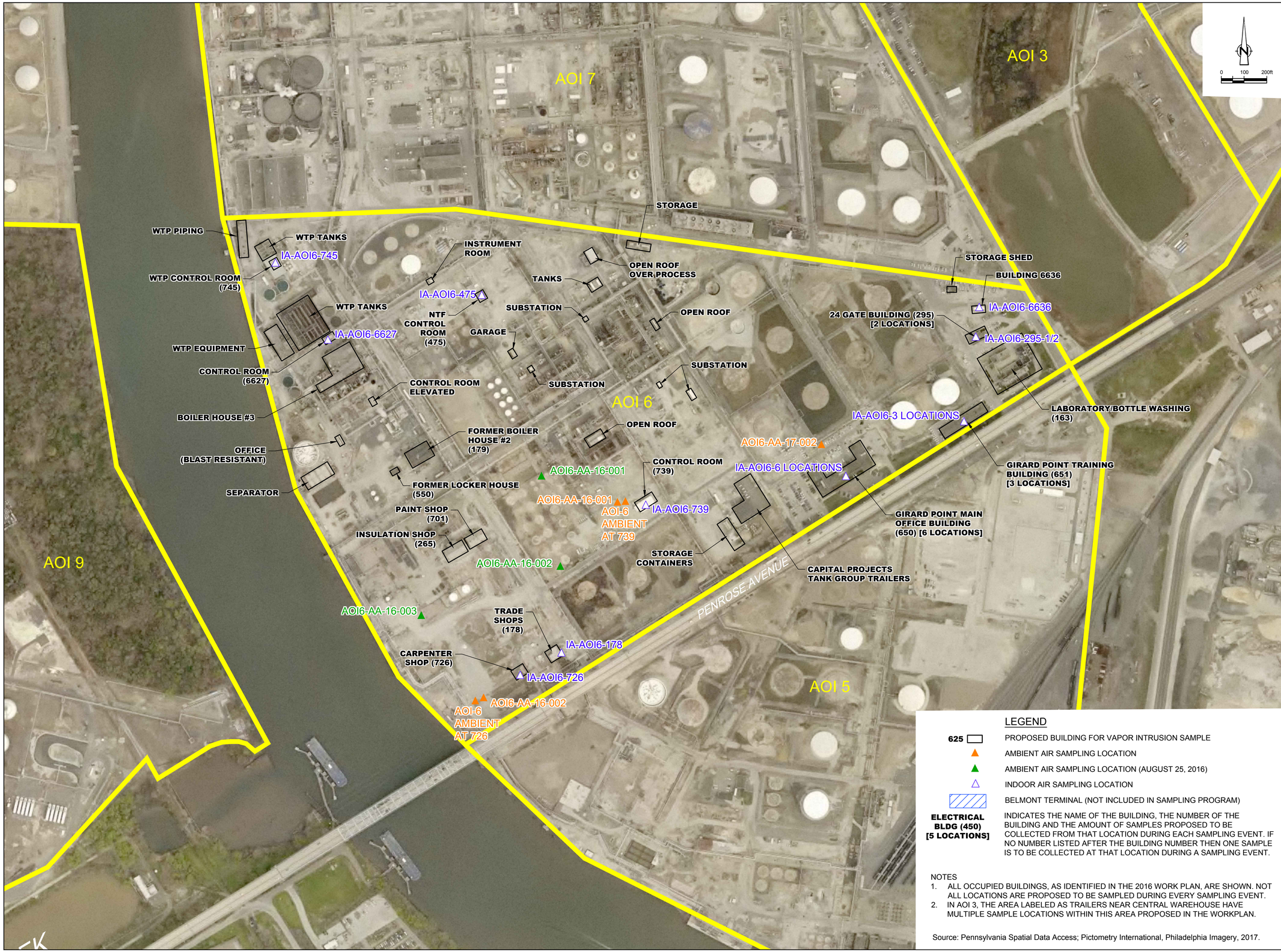
EVERGREEN RESOURCES MANAGEMENT OPERATIONS LLC
PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA
REMEDIAL INVESTIGATION REPORT

LNAPL APPARENT THICKNESS
MAY 11, 2017

11109613-01
Nov 11, 2017

FIGURE 17

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA015.dwg



LEGEND

625	PROPOSED BUILDING FOR VAPOR INTRUSION SAMPLE
▲	AMBIENT AIR SAMPLING LOCATION
▲	AMBIENT AIR SAMPLING LOCATION (AUGUST 25, 2016)
△	INDOOR AIR SAMPLING LOCATION
	BELMONT TERMINAL (NOT INCLUDED IN SAMPLING PROGRAM)
ELECTRICAL BLDG (450) [5 LOCATIONS]	INDICATES THE NAME OF THE BUILDING, THE NUMBER OF THE BUILDING AND THE AMOUNT OF SAMPLES PROPOSED TO BE COLLECTED FROM THAT LOCATION DURING EACH SAMPLING EVENT. IF NO NUMBER LISTED AFTER THE BUILDING NUMBER THEN ONE SAMPLE IS TO BE COLLECTED AT THAT LOCATION DURING A SAMPLING EVENT.

NOTES
1. ALL OCCUPIED BUILDINGS, AS IDENTIFIED IN THE 2016 WORK PLAN, ARE SHOWN. NOT ALL LOCATIONS ARE PROPOSED TO BE SAMPLED DURING EVERY SAMPLING EVENT.
2. IN AOI 3, THE AREA LABELED AS TRAILERS NEAR CENTRAL WAREHOUSE HAVE MULTIPLE SAMPLE LOCATIONS WITHIN THIS AREA PROPOSED IN THE WORKPLAN.

Source: Pennsylvania Spatial Data Access; Pictometry International, Philadelphia Imagery, 2017.

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Client
PHILADELPHIA ENERGY SOLUTIONS FACILITY

Project

No.	Issue	Drawn	Approved	Date

Drawn B. OGILVIE	Designer F. RAMACCIOTTI
Drafting Check	Design Check
Project Manager PM	Date Nov 10, 2017
This document shall not be used for construction unless signed and sealed for construction.	Scale AS SHOWN
Original Size ANSI D	Bar is one inch on original size drawing 0 1"

Project No. 11109613-01

Title
INDOOR AIR AND AMBIENT AIR SAMPLING LOCATIONS AOI 6

Sheet No.
FIGURE 18

Sheet 1 of 1

Plot Date: 10 November 2017 - 3:04 PM Plotted By: Bruce Ogilvie CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA014.dwg

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date June 2014, Accessed: 2017

0 100 300ft

LEGEND

B-173 SAMPLE LOCATION

14 BENZENE CONCENTRATION (µg/L)

0.0 BENZENE ISO-CONCENTRATION CONTOUR (µg/L)

NOTE: 5ppb IS THE NON-RESIDENTIAL GROUNDWATER MSC FOR BENZENE.

GHD

EVERGREEN RESOURCES MANAGEMENT OPERATIONS LLC
PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA
REMEDIAL INVESTIGATION REPORT

DISSOLVED BENZENE GROUNDWATER CONCENTRATIONS
MAY 2016

11109613-01
Nov 10, 2017

FIGURE 19

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002)\11109613-01(002)GN\11109613-01(002)GN-WA018.dwg

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Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation

0 150 300 450
Feet

Coordinate System:
NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Legend

- 2016 Groundwater Sample (Did not Exceed MSC)
- 2016 Groundwater Sample (Exceeds MSC)
- 2016 RI Groundwater Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Piezometer
- 2016 RI Soil Sample
- 2017 RI Soil Sample
- Historical Soil Sample
- 2016 RI (Not Sampled)
- 2016 RI (Attempted Sample Location)
- Air Sample
- Bulkhead
- Tank
- Solid Waste Management Unit
- Area Of Interest

Original Size
ANSI D

Bar is one inch on original size drawing
0 1"

Project : 11109613

Date: Nov 20, 2017

EVERGREEN RESOURCES MANAGEMENT
AOI-6 PHILADELPHIA REFINERY OPERATIONS

DEEP GROUNDWATER RESULTS – MAY 2016

Figure No.

FIGURE 20

GIS File: Q:\GIS\PROJECTS\11109000s\11109613\Layouts\002\11109613-00(002)GIS-OT020.mxd

Table 1

Constituents of Concern
Evergreen Act 2/One Cleanup Program Petroleum Short List
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Volatile Organic Compounds	**CAS No.**
Benzene	71-43-2
Cumene	98-82-8
Dichloroethane, 1,2-	107-06-2
Ethylbenzene	100-41-4
Ethylene Dibromide	106-93-4
Methyl tert butyl ether	1634-04-4
Toluene	108-88-3
Trimethylbenzene, 1,2,4-	95-63-6
Trimethylbenzene, 1,3,5-	108-67-8
Xylenes	1330-20-7
Semi Volatile Organic Compounds	**CAS No.**
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Chrysene	218-01-9
Fluorene	86-73-7
Naphthalene	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0
Metals	**CAS No.**
Lead	7439-92-1

Constituents are from Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E (pgs. 29-30) of PADEP Document, Closure Requirements for Underground Storage Tank Systems, effective April 1, 1998 and the March 18, 2008 revised PADEP Petroleum Short List. In May 2009, two additional COCs, 1,2,4-trimethylbenze (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs by Evergreen based on the PADEP's revisions to the petroleum short list of compounds and at the request of the PADEP. The COC listing for groundwater was also revised in 2012 to follow the soil COC listing.

Table 2

Characterization Activities
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, A Series of Evergreen Resources Group, LLC

Location ID	Location Rationale	Media	Surface Soil Sample Collected (0-2 ft bgs)	Subsurface Soil Sample Collected (>2 ft bgs)	Groundwater Sample Collection	Analyte List
B-171	Investigate groundwater quality to characterize groundwater; characterize soil	GW/Soil	X	X	X	Evergreen COCs, Table 1
B-172	Investigate groundwater quality to characterize groundwater; characterize soil	GW/Soil	X	X	X	Evergreen COCs, Table 1
B-173	Investigate groundwater quality to characterize groundwater; characterize soil	GW/Soil	X	X	X	Evergreen COCs, Table 1
B-174	Investigate groundwater quality to characterize groundwater; characterize soil	GW/Soil	X	X	X	Evergreen COCs, Table 1
B-175	Investigate groundwater quality in vicinity of LNAPL plume	GW/Soil	X	X	X	Evergreen COCs, Table 1
B-115	Characterize groundwater conditions in vicinity of B-129 and along NE boundary	GW			X	Evergreen COCs, Table 1
B-116	Characterize groundwater conditions along NE boundary	GW			X	Evergreen COCs, Table 1
B-117	Characterize conditions downgradient of #4 Boilerhouse and Tank Farm	GW			X	Evergreen COCs, Table 1
B-125	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-126	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-131	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-132	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-132D	Monitor Deep (AOI-11) groundwater	GW			X	Evergreen COCs, Table 1
B-133	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-133D	Monitor Deep (AOI-11) groundwater	GW			X	Evergreen COCs, Table 1
B-134	Characterize groundwater conditions under NAPL	GW			X	Evergreen COCs, Table 1
B-134D	Monitor Deep (AOI-11) groundwater	GW			X	Evergreen COCs, Table 1
B-144	Characterize groundwater conditions under NAPL	GW			X	Evergreen COCs, Table 1
B-145	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-150	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-152	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-153	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-154	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-155	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-156	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-158	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-162	Characterize groundwater downgradient of historical release unit 1332	GW			X	Evergreen COCs, Table 1
B-163	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-164	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
B-165	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
B-168	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
B-169	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
B-170	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
B-39	Characterize groundwater conditions under NAPL	GW			X	Evergreen COCs, Table 1
B-43	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
B-45	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
B-48D	Monitor Deep (AOI-11) groundwater	GW			X	Evergreen COCs, Table 1
U-4	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
URS-1	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
URS-3	Characterize/delineate groundwater	GW			X	Evergreen COCs, Table 1
URS-4	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
URS-5	Characterize conditions along downgradient boundary	GW			X	Evergreen COCs, Table 1
AOI6-BH-16-001	Delineate/characterize by historic release at #3 Boiler House	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-002	Delineate/characterize by historic release at #3 Boiler House	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-003	Delineate/characterize by historic release at #3 Boiler House	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-004	Delineate/characterize by historic release at #3 Boiler House	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-005	Delineate/characterize by historic release at #3 Boiler House	Soil	X	X		Evergreen COCs, Table 1

Table 2

Characterization Activities
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, A Series of Evergreen Resources Group, LLC

Location ID	Location Rationale	Media	Surface Soil Sample Collected (0-2 ft bgs)	Subsurface Soil Sample Collected (>2 ft bgs)	Groundwater Sample Collection	Analyte List
AOI6-BH-16-006	Delineate/characterize by historic tank incident	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-007	Delineate/characterize by historic release 1733 Unit	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-008	Delineate/characterize by historic release 1733 Unit	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-009	Delineate/characterize by historic release 1733 Unit	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-010	Investigate former Tank 238	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-011	Investigate former Tank 238	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-012	Investigate/characterize/delineate historic release behind former Boiler House 4	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-013	Investigate/characterize/delineate historic release behind former Boiler House 4	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-014	Delineate/characterize historic release unit 1332 line	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-015	Delineate/characterize historic release unit 1332 line	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-016	Delineate/characterize historic release unit 1332 line	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-017	Delineate/characterize historic release unit 1332 line	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-018	Delineate/characterize historic release unit 1332 line	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-019	Delineate/characterize historic release by main office building	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-020	Delineate/characterize historic release by main office building	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-021	Delineate/characterize historic release by main office building	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-022	Delineate/characterize historic release by main office building	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-023	Delineate/characterize historic release unit 1332 line	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-024	Delineate benzene around Tank GP-797 area	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-025	Delineate benzene around Tank GP-797 area	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-026	Delineate benzene around Tank GP-797 area	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-027	Delineate benzene around Tank GP-797 area	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-028	Delineate benzene around Tank GP-797 area	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-029	Delineate benzene around Tank GP-797 area	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-030	Delineate/characterize on northwest side of Tank GP-797 (outside HA-1)	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-031	Delineate/characterize on southeast side of Tank GP-797 (outside HA-3)	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-032	Delineate/characterize on southwest side of Tank GP-797 (outside AOI6-BH-12-128)	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-033	Delineate/characterize in southwest corner of GP-797 tank group dike	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-034	Delineate/characterize on west side of GP-797 tank group dike	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-035	Delineate/characterize in northwest corner of GP-797 tank group dike	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-036	Delineate/characterize in northeast corner of GP-797 tank group dike	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-037	Delineate/characterize on the east side of GP-797 tank group dike	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-038	Characterize in central GP-797 tank group dike (between GP-792, 793, 794 and 795)	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-039	Investigate former Tank 238	Soil	X	X		Evergreen COCs, Table 1
AOI6-BH-16-040	Investigate/characterize/delineate release of caustic material from Tank T-81	Soil	X	X		pH and Evergreen COCs, Table 1
AOI6-BH-16-041	Investigate/characterize/delineate release of caustic material from Tank T-81	Soil	X	X		pH and Evergreen COCs, Table 1
AOI6-BH-16-043	Investigate/characterize/delineate release of caustic material from Tank T-81	Soil	X	X		pH and Evergreen COCs, Table 1
AOI 6 -BH-17-01	Delienate lead exceedance in BH-16-19	Soil	X	X		lead
AOI 6 -BH-17-02	Delienate lead exceedance in BH-16-19	Soil	X	X		lead
AOI 6 -BH-17-03	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI 6 -BH-17-04	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI 6 -BH-17-05	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI 6 -BH-17-06	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI 6 -BH-17-07	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI 6 -BH-17-08	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI 6 -BH-17-09	Delineate lead exceedance in BH-16-041	Soil	X			lead
AOI6-AA16-001	Investigate outdoor air quality in location over NAPL plume - gasoline plume	Outdoor Air				TO-15

Table 2

Characterization Activities
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, A Series of Evergreen Resources Group, LLC

Location ID	Location Rationale	Media	Surface Soil Sample Collected (0-2 ft bgs)	Subsurface Soil Sample Collected (>2 ft bgs)	Groundwater Sample Collection	Analyte List
AOI6-AA16-002	Investigate outdoor air quality in location over NAPL plume - residual oil plume	Outdoor Air				TO-15
AOI6-AA16-003	Investigate outdoor air quality in location over NAPL plume - other NAPL plume	Outdoor Air				TO-15
AOI6-AA16-004	duplicate sample	Outdoor Air				TO-15

Note:

Indoor Air Sampling Summary is in Table 12.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-001**	**AOI6-BH-16-002**	**AOI6-BH-16-003**	**AOI6-BH-16-004**	**AOI6-BH-16-004**	**AOI6-BH-16-005**	**AOI6-BH-16-006**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-001-0-2-SOIL**	**AOI6-BH-16-002-0-2-SOIL**	**AOI6-BH-16-003-0-2-SOIL**	**AOI6-BH-16-004-0-2-SOIL**	**AOI6-BH16-DUP-SOIL-002**	**AOI6-BH-16-005-0-2-SOIL**	**AOI6-BH-16-006-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/12/2016**	**04/12/2016**	**04/12/2016**	**04/21/2016**	**04/21/2016**	**04/12/2016**	**04/22/2016**
Sample Depth:		**Direct Contact**		**1.0-1.5 ft**	**1.0-1.5 ft**	**0.0-0.5 ft**	**0.8-1.8 ft**	**0.8-1.8 ft**	**0.0-0.5 ft**	**1.0-1.5 ft**
		MSC	**MSC**					**Duplicate**		
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.006)	ND(0.005)	ND(0.005)	0.0009 J	0.002 J	ND(0.004)	ND(0.28)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	**ND(0.006)[b]**	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.004)	**ND(0.28)[b]**
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.006)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.28)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.006)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.28)
Benzene	mg/kg	290	0.5	0.002 J	0.001 J	ND(0.005)	0.001 J	0.002 J	0.0004 J	ND(0.28)
Ethylbenzene	mg/kg	890	70	ND(0.006)	ND(0.005)	ND(0.005)	ND(0.005)	0.001 J	ND(0.004)	ND(0.28)
Isopropyl benzene	mg/kg	10000	2500	ND(0.006)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.28)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.006)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.28)
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	0.003 J	0.001 J	ND(0.005)	0.003 J	0.003 J	ND(0.004)	0.088 J
Xylenes (total)	mg/kg	8000	1000	0.001 J	ND(0.005)	ND(0.005)	0.004 J	0.005 J	ND(0.004)	0.063 J
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	0.73	0.34	0.41	0.43	0.6	0.016 J	0.7
Benzo(a)anthracene	mg/kg	130	130	0.95	1.7	1.9	1.1	1.7	0.11	1.2
Benzo(a)pyrene	mg/kg	12	12	1.1	1.7	1.9	1.1	1.5	0.13	1.2
Benzo(b)fluoranthene	mg/kg	76	76	1.5	2.2	2.6	1.3	1.9	0.18	1.3
Benzo(g,h,i)perylene	mg/kg	190000	180	1.3	0.85	1.5	0.7	0.94	0.15	0.76
Chrysene	mg/kg	760	230	1.1	1.7	1.9	1.1	1.7	0.12	1.3
Fluorene	mg/kg	130000	3800	0.32	0.079 J	0.11	0.16	0.19	0.005 J	0.36
Naphthalene	mg/kg	760	25	6.9	0.63	0.51	1.2	1.3	0.025	1.6
Phenanthrene	mg/kg	190000	10000	2.0	0.87	1.7	1.1	1.7	0.053	1.5
Pyrene	mg/kg	96000	2200	1.6	2.0	2.8	1.3	2.3	0.15	2.0
Metals - Total										
Lead	mg/kg	1000[a]	450[b] , 2240[c]	288	180	549[b]	399	529[b]	68.7	142
General Chemistry										
Percent moisture	%	-	-	14.6	24.8	12.2	13.2	12.5	4.9	14.5
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-007**	**AOI6-BH-16-008**	**AOI6-BH-16-009**	**AOI6-BH-16-010**	**AOI6-BH-16-011**	**AOI6-BH-16-012**	**AOI6-BH-16-012**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-007-0-2-SOIL**	**AOI6-BH-16-008-0-2-SOIL**	**AOI6-BH-16-009-0-2-SOIL**	**AOI6-BH-16-010-0-2-SOIL**	**AOI6-BH-16-011-0-2-SOIL**	**AOI6-BH16-012-0-2-SOIL-B**	**AOI6-BH-16-012-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/08/2016**	**04/08/2016**	**04/08/2016**	**04/11/2016**	**04/11/2016**	**04/11/2016**	**04/11/2016**
Sample Depth:		**Direct Contact**		**1.0-2.0 ft**	**1.0-2.0 ft**	**1.5-1.8 ft**	**0.5-0.9 ft**	**0.5-0.8 ft**	**0.5-1.0 ft**	**1.0-1.1 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	ND(0.25)	ND(0.23)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	**ND(0.006)[b]**	ND(0.005)	**ND(0.006)[b]**	ND(0.005)	**ND(0.27)[b]**	**ND(0.25)[b]**	**ND(0.23)[b]**
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	ND(0.25)	ND(0.23)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	ND(0.25)	ND(0.23)
Benzene	mg/kg	290	0.5	0.003 J	0.001 J	0.005 J	0.011	ND(0.27)	ND(0.25)	ND(0.23)
Ethylbenzene	mg/kg	890	70	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	ND(0.25)	ND(0.23)
Isopropyl benzene	mg/kg	10000	2500	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	2.0	0.25
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	ND(0.25)	ND(0.23)
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	0.001 J	ND(0.005)	ND(0.006)	0.004 J	ND(0.27)	ND(0.25)	ND(0.23)
Xylenes (total)	mg/kg	8000	1000	ND(0.006)	ND(0.005)	ND(0.006)	ND(0.005)	ND(0.27)	0.061 J	0.047 J
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	0.2	2.3	4.3	0.079	1.7	1.3	0.69
Benzo(a)anthracene	mg/kg	130	130	0.72	5.5	5.2	0.21	0.99	0.94	1.9
Benzo(a)pyrene	mg/kg	12	12	0.67	4.8	3.3	0.26	0.99	0.89	1.8
Benzo(b)fluoranthene	mg/kg	76	76	0.95	6.3	4	0.41	1.3	1.6	2.3
Benzo(g,h,i)perylene	mg/kg	190000	180	0.51	3.3	1.9	0.23	0.69	0.74	1.4
Chrysene	mg/kg	760	230	0.85	5.6	5.1	0.28	1.0	2.7	1.8
Fluorene	mg/kg	130000	3800	0.07	1.7	1.4	0.012 J	8.5	66	0.33
Naphthalene	mg/kg	760	25	0.63	2.9	1.9	0.22	ND(0.22)	1.3	0.44
Phenanthrene	mg/kg	190000	10000	0.72	10	14	0.23	10	20	2.0
Pyrene	mg/kg	96000	2200	1.2	10	13	0.43	1.9	1.8	3.3
Metals - Total										
Lead	mg/kg	1000[a]	450[b] , 2240[c]	803[b]	298	149	1460[b]	734[b]	141	194
General Chemistry										
Percent moisture	%	-	-	14.7	13.6	11.5	19.7	22.8	20.0	8.2
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-013**	**AOI6-BH-16-014**	**AOI6-BH-16-014**	**AOI6-BH-16-015**	**AOI6-BH-16-015**	**AOI6-BH-16-016**	**AOI6-BH-16-016**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-013-0-2-SOIL**	**AOI6-BH-16-014-0-2-SOIL**	**AOI6-BH-16-014-0-2-071116**	**AOI6-BH-16-015-0-2-SOIL**	**AOI6-BH-16-015-0-2-071116**	**AOI6-BH-16-016-0-2-SOIL**	**AOI6-BH-16-016-0-2-071116**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/11/2016**	**04/05/2016**	**07/11/2016**	**04/05/2016**	**07/11/2016**	**04/04/2016**	**07/11/2016**
Sample Depth:		**Direct Contact**		**0.5-1.0 ft**	**1.0-1.5 ft**	**1.3-1.8 ft**	**1.5-2.0 ft**	**1.0-1.4 ft**	**1.0-1.5 ft**	**1.5-2.0 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.23)	0.11 J	-	0.11 J	-	ND(0.006)	-
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	**ND(0.23)[b]**	**ND(0.33)[b]**	-	**ND(0.33)[b]**	-	**ND(0.006)[b]**	-
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.23)	ND(0.33)	-	ND(0.33)	-	ND(0.006)	-
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.23)	ND(0.33)	-	ND(0.33)	-	ND(0.006)	-
Benzene	mg/kg	290	0.5	ND(0.23)	0.24 J	-	0.053 J	-	0.004 J	-
Ethylbenzene	mg/kg	890	70	ND(0.23)	0.095 J	-	ND(0.33)	-	ND(0.006)	-
Isopropyl benzene	mg/kg	10000	2500	ND(0.23)	ND(0.33)	-	0.77	-	ND(0.006)	-
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.23)	ND(0.33)	-	ND(0.33)	-	ND(0.006)	-
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	ND(0.23)	0.260 J	-	0.130 J	-	0.003 J	-
Xylenes (total)	mg/kg	8000	1000	ND(0.23)	0.280 J	-	0.470	-	ND(0.006)	-
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	0.40	-	6.2	-	5.4	-	1.9
Benzo(a)anthracene	mg/kg	130	130	0.46	-	7.8	-	2.0 J	-	1.7
Benzo(a)pyrene	mg/kg	12	12	0.28	-	8.3	-	1.6 J	-	1.7
Benzo(b)fluoranthene	mg/kg	76	76	0.34	-	8.2	-	2.9	-	2.3
Benzo(g,h,i)perylene	mg/kg	190000	180	0.21	-	6.3	-	2.2	-	1.6
Chrysene	mg/kg	760	230	1.6	-	8.9	-	5.8	-	2.0
Fluorene	mg/kg	130000	3800	2.5	-	9.3	-	7.4	-	5.1
Naphthalene	mg/kg	760	25	ND(0.20)	-	21	-	2.8	-	9.3
Phenanthrene	mg/kg	190000	10000	0.96	-	24	-	16	-	9.6
Pyrene	mg/kg	96000	2200	0.81	-	12	-	8.4	-	2.4
Metals - Total										
Lead	mg/kg	1000[a]	450[b] , 2240[c]	32.0	344	-	671[b]	-	313	-
General Chemistry										
Percent moisture	%	-	-	14.8	33.7	34.4	26.7	19.9	12.5	29.2
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-017**	**AOI6-BH-16-018**	**AOI6-BH-16-019**	**AOI6-BH-16-019**	**AOI6-BH-16-020**	**AOI6-BH-16-021**	**AOI6-BH-16-022**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-017-0-2-SOIL**	**AOI6-BH-16-018-0-2-SOIL**	**AOI6-BH-16-019-0-2-SOIL**	**AOI6-BH16-DUP-SOIL-001**	**AOI6-BH-16-020-0-2-SOIL**	**AOI6-BH-16-021-0-2-SOIL**	**AOI6-BH-16-022-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/11/2016**	**04/11/2016**	**04/21/2016**	**04/21/2016**	**04/21/2016**	**04/21/2016**	**04/06/2016**
Sample Depth:		**Direct Contact**		**0.5-1.0 ft**	**0.8-1.0 ft**	**0.8-1.8 ft**	**0.8-1.8 ft**	**0.0-1.1 ft**	**0.0-0.5 ft**	**0.5-1.0 ft**
		MSC	**MSC**				**Duplicate**			
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.004)	0.001 J	ND(0.006)	ND(0.005)	ND(0.30)	0.11 J	ND(0.24)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.004)	ND(0.004)	**ND(0.006)[b]**	ND(0.005)	**ND(0.30)[b]**	**ND(0.24)[b]**	**ND(0.24)[b]**
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.004)	ND(0.004)	ND(0.006)	ND(0.005)	ND(0.30)	ND(0.24)	ND(0.24)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.004)	ND(0.004)	ND(0.006)	ND(0.005)	ND(0.30)	0.082 J	ND(0.24)
Benzene	mg/kg	290	0.5	0.001 J	0.071	ND(0.006)	ND(0.005)	0.039 J	0.062 J	0.089 J
Ethylbenzene	mg/kg	890	70	ND(0.004)	0.001 J	ND(0.006)	ND(0.005)	ND(0.30)	ND(0.24)	0.052 J
Isopropyl benzene	mg/kg	10000	2500	ND(0.004)	0.001 J	ND(0.006)	ND(0.005)	0.420	ND(0.24)	ND(0.24)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.004)	ND(0.004)	ND(0.006)	ND(0.005)	ND(0.30)	ND(0.24)	ND(0.24)
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	ND(0.004)	0.005	ND(0.006)	ND(0.005)	ND(0.30)	0.10 J	0.15 J
Xylenes (total)	mg/kg	8000	1000	ND(0.004)	0.002 J	ND(0.006)	ND(0.005)	0.072 J	0.10 J	0.18 J
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	0.35	0.67	1.4	1.4	3.7	1.0	2.1
Benzo(a)anthracene	mg/kg	130	130	3.3	1.4	1.2	1.3	7.4	2.4	3.4
Benzo(a)pyrene	mg/kg	12	12	4.2	1.9	1.3	1.4	7.8	2.2	4.1
Benzo(b)fluoranthene	mg/kg	76	76	6.7	2.3	1.5	1.7	9.8	3.0	5.3
Benzo(g,h,i)perylene	mg/kg	190000	180	4.8	1.5	1.4	1.5	5.1	1.4	3.3
Chrysene	mg/kg	760	230	4.9	1.9	1.3	1.4	7.7	2.3	4.9
Fluorene	mg/kg	130000	3800	0.081	0.48	0.59	0.61	2.2	0.53	1.6
Naphthalene	mg/kg	760	25	0.12	2.1	7.7	8.3	3.3	1.1	3.5
Phenanthrene	mg/kg	190000	10000	2.4	1.6	3.3	3.2	13	3.2	5.4
Pyrene	mg/kg	96000	2200	8.1	2.4	1.6	1.6	13	3.9	7.9
Metals - Total										
Lead	mg/kg	1000[a]	450[b] , 2240[c]	180	138	**2920[ab]**	**6690[ab]**	199	223	236
General Chemistry										
Percent moisture	%	-	-	9.4	8.6	22.8	20.3	12.6	9.6	12.5
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-023**	**AOI6-BH-16-025**	**AOI6-BH-16-025**	**AOI6-BH-16-026**	**AOI6-BH-16-027**	**AOI6-BH-16-028**	**AOI6-BH-16-029**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-023-0-2-SOIL**	**AOI6-BH-16-025-0-2-SOIL**	**AOI6-BH16-DUP-04-22-16-003**	**AOI6-BH-16-026-0-2-SOIL**	**AOI6-BH-16-027-0-2-SOIL**	**AOI6-BH-16-028-0-2-SOIL**	**AOI6-BH-16-029-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/21/2016**	**04/22/2016**	**04/22/2016**	**04/22/2016**	**04/13/2016**	**04/13/2016**	**04/13/2016**
Sample Depth:		**Direct Contact**		**1.5-1.9 ft**	**1.5-1.9 ft**	**1.5-1.9 ft**	**0.4-1.3 ft**	**1.8-2.0 ft**	**0.3-0.5 ft**	**1.8-2.0 ft**
		MSC	**MSC**			**Duplicate**				
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	560	35	0.12 J	0.095 J	0.096 J	ND(0.22)	ND(0.005)	0.057 J	0.25 J
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.47)[b]	ND(0.22)[b]	ND(0.21)[b]	ND(0.22)[b]	ND(0.005)	ND(0.26)[b]	ND(0.25)[b]
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.47)	ND(0.22)	ND(0.21)	ND(0.22)	ND(0.005)	ND(0.26)	ND(0.25)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.47)	0.045 J	ND(0.21)	ND(0.22)	ND(0.005)	ND(0.26)	0.095 J
Benzene	mg/kg	290	0.5	0.13 J	**2.7[b]**	**2.6[b]**	**7.6[b]**	ND(0.005)	0.46	**0.990[b]**
Ethylbenzene	mg/kg	890	70	0.10 J	0.12 J	0.110 J	0.082 J	ND(0.005)	0.10 J	0.30
Isopropyl benzene	mg/kg	10000	2500	0.34 J	2.9	2.6	1.8	ND(0.005)	0.22 J	1.7
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.47)	ND(0.22)	ND(0.21)	ND(0.22)	ND(0.005)	ND(0.26)	ND(0.25)
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	0.20 J	0.9	0.75	ND(0.22)	ND(0.005)	0.45	0.37
Xylenes (total)	mg/kg	8000	1000	0.21 J	0.53	0.48	0.092 J	ND(0.005)	0.34	0.6
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	2.1	4.4	4.9	0.71	0.007 J	0.39	2.9
Benzo(a)anthracene	mg/kg	130	130	1.3	3.2	3.8	1.3	0.011 J	0.91	6.1
Benzo(a)pyrene	mg/kg	12	12	1.7	2.3	2.7	1.3	0.010 J	1.2	6.2
Benzo(b)fluoranthene	mg/kg	76	76	1.8	2.8	3.2	0.89	0.016 J	1.6	8.7
Benzo(g,h,i)perylene	mg/kg	190000	180	1.8	0.93	1.0	0.72	0.009 J	1.1	4.5
Chrysene	mg/kg	760	230	1.5	2.8	3.2	2.2	0.021 J	1.0	6.1
Fluorene	mg/kg	130000	3800	1.9	4.2	4.4	0.51	0.009 J	0.16	3.2
Naphthalene	mg/kg	760	25	12	0.46	0.48	1.1	0.010 J	1.2	3.1
Phenanthrene	mg/kg	190000	10000	4.8	13	14	1.9	0.02 J	1.1	11
Pyrene	mg/kg	96000	2200	2.4	5.6	6.6	2.1	0.032	1.2	11
Metals - Total										
Lead	mg/kg	1000[a]	450[b] , 2240[c]	393	10.3	10.2	61.8	20.0	159	138
General Chemistry										
Percent moisture	%	-	-	34.9	8.7	9.1	8.8	24.8	8.7	12.0
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-030**	**AOI6-BH-16-031**	**AOI6-BH-16-032**	**AOI6-BH-16-033**	**AOI6-BH-16-034**	**AOI6-BH-16-035**	**AOI6-BH-16-036**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-030-0-2-SOIL**	**AOI6-BH-16-031-0-2-SOIL**	**AOI6-BH-16-032-0-2-SOIL**	**AOI6-BH-16-033-0-2-SOIL**	**AOI6-BH-16-034-0-2-SOIL**	**AOI6-BH-16-035-0-2-SOIL**	**AOI6-BH-16-036-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/14/2016**	**04/14/2016**	**04/13/2016**	**04/13/2016**	**04/13/2016**	**04/13/2016**	**04/14/2016**
Sample Depth:		**Direct Contact**		**1.5-2.0 ft**	**1.0-2.0 ft**	**1.0-2.0 ft**	**1.5-2.0 ft**	**1.5-1.8 ft**	**1.5-2.0 ft**	**1.3-1.8 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(4.4)	ND(0.22)	ND(0.22)	ND(0.004)	ND(5.0)	ND(0.004)	ND(4.5)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	**ND(4.4)[b]**	**ND(0.22)[b]**	**ND(0.22)[b]**	ND(0.004)	**ND(5.0)[b]**	ND(0.004)	**ND(4.5)[b]**
1,2-Dichloroethane	mg/kg	86	0.5	**ND(4.4)[b]**	ND(0.22)	ND(0.22)	ND(0.004)	**ND(5.0)[b]**	ND(0.004)	**ND(4.5)[b]**
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(4.4)	ND(0.22)	ND(0.22)	ND(0.004)	ND(5.0)	ND(0.004)	ND(4.5)
Benzene	mg/kg	290	0.5	**9.4[b]**	**0.630[b]**	0.12 J	0.003 J	**44[b]**	0.001 J	**0.55 J[b]**
Ethylbenzene	mg/kg	890	70	ND(4.4)	0.053 J	0.051 J	ND(0.004)	ND(5.0)	ND(0.004)	ND(4.5)
Isopropyl benzene	mg/kg	10000	2500	18	4	1.7	0.019	230	0.021	59
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	**ND(4.4)[b]**	ND(0.22)	ND(0.22)	ND(0.004)	**ND(5.0)[b]**	ND(0.004)	**ND(4.5)[b]**
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	ND(4.4)	ND(0.22)	0.091 J	ND(0.004)	38	ND(0.004)	ND(4.5)
Xylenes (total)	mg/kg	8000	1000	ND(4.4)	0.083 J	0.13 J	ND(0.004)	2.1 J	ND(0.004)	ND(4.5)
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	0.037 J	ND(0.019)	0.008 J	0.030 J	0.027	ND(0.019)	0.064 J
Benzo(a)anthracene	mg/kg	130	130	0.094 J	0.004 J	0.032	0.12	0.09	0.008 J	0.35
Benzo(a)pyrene	mg/kg	12	12	0.12	0.006 J	0.036	0.13	0.092	0.009 J	0.30
Benzo(b)fluoranthene	mg/kg	76	76	0.18	0.007 J	0.049	0.18	0.13	0.014 J	0.57
Benzo(g,h,i)perylene	mg/kg	190000	180	0.13	0.005 J	0.032	0.13	0.083	0.010 J	0.27
Chrysene	mg/kg	760	230	0.098	0.005 J	0.038	0.14	0.11	0.010 J	0.41
Fluorene	mg/kg	130000	3800	ND(0.095)	ND(0.019)	ND(0.018)	ND(0.092)	0.017 J	ND(0.019)	0.035 J
Naphthalene	mg/kg	760	25	0.024 J	ND(0.019)	ND(0.018)	ND(0.092)	0.07	ND(0.019)	0.099
Phenanthrene	mg/kg	190000	10000	0.054 J	0.004 J	0.025	0.058 J	0.087	0.010 J	0.26
Pyrene	mg/kg	96000	2200	0.13	0.007 J	0.057	0.19	0.16	0.015 J	0.51
Metals - Total										
Lead	mg/kg	1000[a]	450[b] , 2240[c]	66.0	5.63	10.3	12.8	14.0	10.0	60.8
General Chemistry										
Percent moisture	%	-	-	11.4	10.4	8.1	8.4	13.2	10.7	10.5
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-037**	**AOI6-BH-16-038**	**AOI6-BH-16-039**	**AOI6-BH-16-040**	**AOI6-BH-16-041**	**AOI6-BH-16-043**	**B-171**	**B-172**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-037-0-2-SOIL**	**AOI6-BH-16-038-0-2-SOIL**	**AOI6-BH-16-039-0-2-SOIL**	**AOI6-BH-16-040-0-2-SOIL**	**AOI6-BH-16-041-0-2-SOIL**	**AOI6-BH-16-43-0-2-SOIL**	**AOI6-B-171-0-2-SOIL**	**AOI6-B-172-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/14/2016**	**04/14/2016**	**04/11/2016**	**04/07/2016**	**04/07/2016**	**04/07/2016**	**04/06/2016**	**04/06/2016**
Sample Depth:		**Direct Contact**		**1.0-1.8 ft**	**1.5-1.8 ft**	**0.5-0.6 ft**	**0.5-0.8 ft**	**0.8-1.3 ft**	**0.5-1.0 ft**	**1.0-2.0 ft**	**0.5-1.0 ft**
		MSC	**MSC**								
Parameters	**Units**	a	b								
Volatile Organic Compounds											
1,2,4-Trimethylbenzene	mg/kg	560	35	**ND(94)[b]**	ND(4.8)	ND(0.005)	0.33 J	-	0.045 J	ND(0.004)	0.110 J
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	**ND(94)[b]**	**ND(4.8)[b]**	ND(0.005)	**ND(1.1)[b]**	-	**ND(0.22)[b]**	ND(0.004)	**ND(0.38)[b]**
1,2-Dichloroethane	mg/kg	86	0.5	**ND(94)[b]**	**ND(4.8)[b]**	ND(0.005)	**ND(1.1)[b]**	-	ND(0.22)	ND(0.004)	ND(0.38)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(94)	ND(4.8)	ND(0.005)	0.38 J	-	0.046 J	ND(0.004)	ND(0.38)
Benzene	mg/kg	290	0.5	**710[ab]**	**8.8[b]**	ND(0.005)	**1.1 J[b]**	-	**0.810[b]**	0.001 J	0.21 J
Ethylbenzene	mg/kg	890	70	**ND(94)[b]**	ND(4.8)	ND(0.005)	0.76 J	-	0.064 J	ND(0.004)	0.10 J
Isopropyl benzene	mg/kg	10000	2500	**6500[b]**	14	ND(0.005)	1.2	-	0.055 J	ND(0.004)	ND(0.38)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	**ND(94)[b]**	**ND(4.8)[b]**	ND(0.005)	ND(1.1)	-	ND(0.22)	ND(0.004)	ND(0.38)
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	**840[b]**	ND(4.8)	ND(0.005)	ND(1.1)	-	0.190 J	ND(0.004)	0.58
Xylenes (total)	mg/kg	8000	1000	26 J	ND(4.8)	ND(0.005)	0.88 J	-	0.33	ND(0.004)	0.51
Semi-Volatile Organic Compounds											
Anthracene	mg/kg	190000	350	0.068 J	0.073 J	0.005 J	1.7	6.2	0.26	0.12	-
Benzo(a)anthracene	mg/kg	130	130	0.11	0.19	0.019 J	3.1	12	0.71	0.44	-
Benzo(a)pyrene	mg/kg	12	12	0.16	0.22	0.019 J	2.2	8.0	1.1	0.45	-
Benzo(b)fluoranthene	mg/kg	76	76	0.24	0.33	0.033	3.2	14	1.5	0.54	-
Benzo(g,h,i)perylene	mg/kg	190000	180	0.19	0.20	0.015 J	1.2	5.1	1.3	0.29	-
Chrysene	mg/kg	760	230	0.14	0.22	0.025	2.9	12	0.78	0.42	-
Fluorene	mg/kg	130000	3800	0.049 J	0.036 J	ND(0.023)	1.6	6.8	0.050 J	0.044 J	-
Naphthalene	mg/kg	760	25	1.3	0.093 J	0.006 J	3.2	22	0.27	0.23	-
Phenanthrene	mg/kg	190000	10000	0.18	0.18	0.016 J	6.7	25	0.42	0.22	-
Pyrene	mg/kg	96000	2200	0.22	0.28	0.033	6.4	21	0.86	0.50	-
Metals - Total											
Lead	mg/kg	1000[a]	450[b] , 2240[c]	100	33.1	7.22	249	**3820[ab]**	331	45.7	168
General Chemistry											
Percent moisture	%	-	-	15.1	10.1	24.7	10.6	16.5	8.0	6.2	14.6
pH, lab	s.u.	-	-	-	-	-	8.15	7.89	9.15	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**B-172**	**B-173**	**B-173**	**B-174**	**B-174**	**B-175**	**B-175**	**AOI6-BH-17-001**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-B-172-0-2-071216**	**AOI6-B-173-0-2-SOIL**	**AOI6-B-173-0-2-071216**	**AOI6-B-174-0-2-SOIL**	**AOI6-B-174-0-2-071316**	**AOI6-B-175-0-2-SOIL**	**AOI6-B-175-0-2-071316**	**AOI6-BH-17-001-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**07/12/2016**	**04/05/2016**	**07/12/2016**	**04/04/2016**	**07/13/2016**	**04/05/2016**	**07/13/2016**	**01/06/2017**
Sample Depth:		**Direct Contact**		**0.5-1.0 ft**	**1.0-1.5 ft**	**1.0-1.5 ft**	**1.0-1.5 ft**	**1.0-1.5 ft**	**1.5-2.0 ft**	**1.5-2.0 ft**	**0.5-0.75 ft**
		MSC	**MSC**								
Parameters	**Units**	a	b								
Volatile Organic Compounds											
1,2,4-Trimethylbenzene	mg/kg	560	35	-	0.31	-	ND(0.004)	-	0.29 J	-	-
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	-	**ND(0.31)[b]**	-	ND(0.004)	-	**ND(0.32)[b]**	-	-
1,2-Dichloroethane	mg/kg	86	0.5	-	ND(0.31)	-	ND(0.004)	-	ND(0.32)	-	-
1,3,5-Trimethylbenzene	mg/kg	10000	210	-	0.130 J	-	ND(0.004)	-	0.26 J	-	-
Benzene	mg/kg	290	0.5	-	0.300 J	-	ND(0.004)	-	**1.1[b]**	-	-
Ethylbenzene	mg/kg	890	70	-	ND(0.31)	-	ND(0.004)	-	0.35	-	-
Isopropyl benzene	mg/kg	10000	2500	-	0.36	-	ND(0.004)	-	0.27 J	-	-
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	-	ND(0.31)	-	ND(0.004)	-	ND(0.32)	-	-
Naphthalene	mg/kg	760	25	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	-	0.13 J	-	ND(0.004)	-	1.3	-	-
Xylenes (total)	mg/kg	8000	1000	-	0.66	-	ND(0.004)	-	1.6	-	-
Semi-Volatile Organic Compounds											
Anthracene	mg/kg	190000	350	0.80	-	0.089 J	-	0.110 J	-	2.4	-
Benzo(a)anthracene	mg/kg	130	130	2.4	-	0.30	-	0.60	-	1.9	-
Benzo(a)pyrene	mg/kg	12	12	1.4	-	0.33	-	0.54	-	1.4	-
Benzo(b)fluoranthene	mg/kg	76	76	2.6	-	0.44	-	0.71	-	1.9	-
Benzo(g,h,i)perylene	mg/kg	190000	180	0.95	-	0.39	-	0.39	-	1.7	-
Chrysene	mg/kg	760	230	2.3	-	0.42	-	0.63	-	2.0	-
Fluorene	mg/kg	130000	3800	0.079 J	-	0.049 J	-	ND(0.21)	-	3.6	-
Naphthalene	mg/kg	760	25	1.2	-	0.27	-	0.18 J	-	9.3	-
Phenanthrene	mg/kg	190000	10000	0.93	-	0.34	-	0.40	-	10	-
Pyrene	mg/kg	96000	2200	3.0	-	0.49	-	0.89	-	2.8	-
Metals - Total											
Lead	mg/kg	1000[a]	450[b] , 2240[c]	-	170	-	6.22	-	207	-	211
General Chemistry											
Percent moisture	%	-	-	26.2	17.5	9.1	4.8	21.2	30.1	40.2	-
pH, lab	s.u.	-	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3a

Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-17-002**	**AOI6-BH-17-003**	**AOI6-BH-17-004**	**AOI6-BH-17-005**	**AOI6-BH-17-009**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-17-002-0-2-SOIL**	**AOI6-BH-17-003-0-2-SOIL**	**AOI6-BH-17-004-0-2-SOIL**	**AOI6-BH-17-005-0-2-SOIL**	**AOI6-BH-17-009-0-2-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**01/06/2017**	**01/06/2017**	**01/06/2017**	**01/06/2017**	**01/06/2017**
Sample Depth:		**Direct Contact**		**0.8-1.1 ft**	**1.2-1.5 ft**	**1.2-1.6 ft**	**1.0-1.25 ft**	**1.0-1.3 ft**
		MSC	**MSC**					
Parameters	**Units**	a	b					
Volatile Organic Compounds								
1,2,4-Trimethylbenzene	mg/kg	560	35	-	-	-	-	-
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	-	-	-	-	-
1,2-Dichloroethane	mg/kg	86	0.5	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000	210	-	-	-	-	-
Benzene	mg/kg	290	0.5	-	-	-	-	-
Ethylbenzene	mg/kg	890	70	-	-	-	-	-
Isopropyl benzene	mg/kg	10000	2500	-	-	-	-	-
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	-	-	-	-	-
Naphthalene	mg/kg	760	25	-	-	-	-	-
Toluene	mg/kg	10000	100	-	-	-	-	-
Xylenes (total)	mg/kg	8000	1000	-	-	-	-	-
Semi-Volatile Organic Compounds								
Anthracene	mg/kg	190000	350	-	-	-	-	-
Benzo(a)anthracene	mg/kg	130	130	-	-	-	-	-
Benzo(a)pyrene	mg/kg	12	12	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	76	76	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	-	-	-	-	-
Chrysene	mg/kg	760	230	-	-	-	-	-
Fluorene	mg/kg	130000	3800	-	-	-	-	-
Naphthalene	mg/kg	760	25	-	-	-	-	-
Phenanthrene	mg/kg	190000	10000	-	-	-	-	-
Pyrene	mg/kg	96000	2200	-	-	-	-	-
Metals - Total								
Lead	mg/kg	1000[a]	450[b] , 2240[c]	234	899[b]	**7490[ab]**	770[b]	34.3
General Chemistry								
Percent moisture	%	-	-	-	-	-	-	-
pH, lab	s.u.	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential,
c	Site Specific Standard for Lead (SSS) August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
ft	Feet.

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-004**	**AOI6-BH-16-006**	**AOI6-BH-16-007**	**AOI6-BH-16-008**	**AOI6-BH-16-014**	**AOI6-BH-16-014**	**AOI6-BH-16-015**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-004-2-4-SOIL**	**AOI6-BH-16-006-2-4-SOIL**	**AOI6-BH-16-007-2-4-SOIL**	**AOI6-BH-16-008-2-4-SOIL**	**AOI6-BH-16-014-2-4-SOIL**	**AOI6-BH-16-014-2-4-071116**	**AOI6-BH-16-015-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/21/2016**	**04/22/2016**	**04/08/2016**	**04/08/2016**	**04/05/2016**	**07/11/2016**	**04/05/2016**
Sample Depth:		**Direct Contact**		**1.8-2.3 ft**	**1.5-2.3 ft**	**2.0-2.3 ft**	**2.0-2.5 ft**	**2.0-2.5 ft**	**2.0-2.3 ft**	**2.0-2.1 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	640	35	ND(0.005)	ND(0.22)	ND(0.005)	ND(0.004)	ND(0.44)	-	ND(0.27)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	ND(0.005)	**ND(0.22)[b]**	ND(0.005)	ND(0.004)	**ND(0.44)[b]**	-	**ND(0.27)[b]**
1,2-Dichloroethane	mg/kg	98	0.5	ND(0.005)	ND(0.22)	ND(0.005)	ND(0.004)	ND(0.44)	-	ND(0.27)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.005)	ND(0.22)	ND(0.005)	ND(0.004)	ND(0.44)	-	ND(0.27)
2-Phenylbutane (sec-Butylbenzene)	mg/kg	10000	2800	-	-	-	-	-	-	-
Benzene	mg/kg	330	0.5	0.001 J	0.023 J	0.004 J	0.001 J	ND(0.44)	-	ND(0.27)
Cyclohexane	mg/kg	10000	6900	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	1000	70	ND(0.005)	ND(0.22)	ND(0.005)	ND(0.004)	ND(0.44)	-	ND(0.27)
Hexane	mg/kg	10000	5600	-	-	-	-	-	-	-
Isopropyl benzene	mg/kg	10000	2500	ND(0.005)	ND(0.22)	ND(0.005)	ND(0.004)	ND(0.44)	-	0.23 J
Methyl tert butyl ether (MTBE)	mg/kg	9900	2	ND(0.005)	ND(0.22)	ND(0.005)	ND(0.004)	ND(0.44)	-	ND(0.27)
Naphthalene	mg/kg	190000	25	-	-	-	-	-	-	-
tert-Butylbenzene	mg/kg	10000	2200	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	0.002 J	0.073 J	ND(0.005)	ND(0.004)	0.29 J	-	ND(0.27)
Xylenes (total)	mg/kg	9100	1000	0.001 J	0.065 J	ND(0.005)	ND(0.004)	0.10 J	-	0.092 J
Semi-Volatile Organic Compounds										
2,4-Dimethylphenol	mg/kg	10000	230	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000	23	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000	1900	-	-	-	-	-	-	-
2-Methylphenol	mg/kg	190000	580	-	-	-	-	-	-	-
4-Methylphenol	mg/kg	190000	58	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000	6	-	-	-	-	-	-	-
Acenaphthene	mg/kg	190000	4700	-	-	-	-	-	-	-
Anthracene	mg/kg	190000	350	0.55	0.43	0.84	1.8	-	12	-
Benzo(a)anthracene	mg/kg	190000	430	1.6	0.75	2.2	3.7	-	25	-
Benzo(a)pyrene	mg/kg	190000	46	1.5	0.74	1.8	2.9	-	26	-
Benzo(b)fluoranthene	mg/kg	190000	170	1.7	1.0	2.3	4.0	-	26	-
Benzo(b)pyridine (Quinoline)	mg/kg	10000	0.37	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	0.84	0.52	1.2	2.0	-	15	-
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	mg/kg	190000	190	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	10000	130	-	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	1.5	0.82	2.1	3.7	-	30	-
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-
Diethyl phthalate	mg/kg	10000	9300	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	mg/kg	10000	4900	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000	3200	-	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	0.20	0.27	0.31	1.7	-	12	-
Indeno(1,2,3-cd)pyrene	mg/kg	190000	22000	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000	25	1.1	1.6	0.71	1.5	-	24	-
Phenanthrene	mg/kg	190000	10000	1.2	1.1	2.6	8.8	-	37	-
Phenol	mg/kg	18000	200	-	-	-	-	-	-	-
Pyrene	mg/kg	190000	2200	1.9	1.2	3.4	7.3	-	39	-
Pyridine	mg/kg	10000	12	-	-	-	-	-	-	-

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-004**	**AOI6-BH-16-006**	**AOI6-BH-16-007**	**AOI6-BH-16-008**	**AOI6-BH-16-014**	**AOI6-BH-16-014**	**AOI6-BH-16-015**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-004-2-4-SOIL**	**AOI6-BH-16-006-2-4-SOIL**	**AOI6-BH-16-007-2-4-SOIL**	**AOI6-BH-16-008-2-4-SOIL**	**AOI6-BH-16-014-2-4-SOIL**	**AOI6-BH-16-014-2-4-071116**	**AOI6-BH-16-015-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/21/2016**	**04/22/2016**	**04/08/2016**	**04/08/2016**	**04/05/2016**	**07/11/2016**	**04/05/2016**
Sample Depth:		**Direct Contact**		**1.8-2.3 ft**	**1.5-2.3 ft**	**2.0-2.3 ft**	**2.0-2.5 ft**	**2.0-2.5 ft**	**2.0-2.3 ft**	**2.0-2.1 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Metals - Total										
Cobalt	mg/kg	190000	160	-	-	-	-	-	-	-
Lead	mg/kg	190000	450	189	225	243	267	352	-	134
Nickel	mg/kg	190000	650	-	-	-	-	-	-	-
Vanadium	mg/kg	190000	820	-	-	-	-	-	-	-
Zinc	mg/kg	190000	12000	-	-	-	-	-	-	-
General Chemistry										
Percent moisture	%	-	-	11	11.8	17.6	14.8	44.3	34.8	21.6
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016.

b PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10)[b] Indicates reporting limit was above the applicable standard.

6.5[A] Concentration exceeds the indicated standard.

SS Lead value is the site specific standard for lead accepted by the PADEP.

ft feet

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-015**	**AOI6-BH-16-016**	**AOI6-BH-16-016**	**AOI6-BH-16-019**	**AOI6-BH-16-022**	**AOI6-BH-16-025**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-015-2-4-071116**	**AOI6-BH-16-016-2-4-SOIL**	**AOI6-BH-16-016-2-4-071116**	**AOI6-BH-16-019-2-4-SOIL**	**AOI6-BH-16-022-2-4-SOIL**	**AOI6-BH-16-025-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**07/11/2016**	**04/04/2016**	**07/11/2016**	**04/21/2016**	**04/06/2016**	**04/22/2016**
Sample Depth:		**Direct Contact**		**2.0-2.2 ft**	**2.0-2.5 ft**	**2.0-2.3 ft**	**1.8-3.0 ft**	**2.3-2.5 ft**	**1.9-2.2 ft**
		MSC	**MSC**						
Parameters	**Units**	a	b						
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	mg/kg	640	35	-	0.14 J	-	ND(0.006)	ND(0.005)	**50 J[b]**
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	-	**ND(0.34)[b]**	-	**ND(0.006)[b]**	ND(0.005)	**ND(24)[b]**
1,2-Dichloroethane	mg/kg	98	0.5	-	ND(0.34)	-	ND(0.006)	ND(0.005)	**ND(24)[b]**
1,3,5-Trimethylbenzene	mg/kg	10000	210	-	ND(0.34)	-	ND(0.006)	ND(0.005)	18 J
2-Phenylbutane (sec-Butylbenzene)	mg/kg	10000	2800	-	-	-	-	-	-
Benzene	mg/kg	330	0.5	-	ND(0.34)	-	0.002 J	ND(0.005)	**1400 J[ab]**
Cyclohexane	mg/kg	10000	6900	-	-	-	-	-	-
Ethylbenzene	mg/kg	1000	70	-	ND(0.34)	-	ND(0.006)	ND(0.005)	61 J
Hexane	mg/kg	10000	5600	-	-	-	-	-	-
Isopropyl benzene	mg/kg	10000	2500	-	0.44	-	0.002 J	ND(0.005)	2200 J
Methyl tert butyl ether (MTBE)	mg/kg	9900	2	-	ND(0.34)	-	ND(0.006)	ND(0.005)	**ND(24)[b]**
Naphthalene	mg/kg	190000	25	-	-	-	-	-	-
tert-Butylbenzene	mg/kg	10000	2200	-	-	-	-	-	-
Toluene	mg/kg	10000	100	-	0.19 J	-	0.002 J	ND(0.005)	**640 J[b]**
Xylenes (total)	mg/kg	9100	1000	-	0.16 J	-	ND(0.006)	ND(0.005)	340 J
Semi-Volatile Organic Compounds									
2,4-Dimethylphenol	mg/kg	10000	230	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000	23	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000	1900	-	-	-	-	-	-
2-Methylphenol	mg/kg	190000	580	-	-	-	-	-	-
4-Methylphenol	mg/kg	190000	58	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000	6	-	-	-	-	-	-
Acenaphthene	mg/kg	190000	4700	-	-	-	-	-	-
Anthracene	mg/kg	190000	350	2.3	-	3.4	0.39	0.05	1.2
Benzo(a)anthracene	mg/kg	190000	430	1.2	-	3.3	1.4	0.13	1.1
Benzo(a)pyrene	mg/kg	190000	46	1.2	-	3.3	1.4	0.14	0.69
Benzo(b)fluoranthene	mg/kg	190000	170	1.2	-	3.6	1.7	0.2	1.0
Benzo(b)pyridine (Quinoline)	mg/kg	10000	0.37	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	1.6	-	3.5	0.88	0.11	0.33
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	mg/kg	190000	190	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	10000	130	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	2.4	-	3.7	1.4	0.14	0.97
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-
Diethyl phthalate	mg/kg	10000	9300	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	mg/kg	10000	4900	-	-	-	-	-	-
Fluoranthene	mg/kg	190000	3200	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	2.6	-	6.3	0.20	0.019 J	0.85
Indeno(1,2,3-cd)pyrene	mg/kg	190000	22000	-	-	-	-	-	-
Naphthalene	mg/kg	190000	25	6.3	-	18	1.5	0.045	2.0
Phenanthrene	mg/kg	190000	10000	7.2	-	17	1.1	0.16	4.1
Phenol	mg/kg	18000	200	-	-	-	-	-	-
Pyrene	mg/kg	190000	2200	3.2	-	4.2	1.4	0.21	2.1
Pyridine	mg/kg	10000	12	-	-	-	-	-	-

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-015**	**AOI6-BH-16-016**	**AOI6-BH-16-016**	**AOI6-BH-16-019**	**AOI6-BH-16-022**	**AOI6-BH-16-025**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-015-2-4-071116**	**AOI6-BH-16-016-2-4-SOIL**	**AOI6-BH-16-016-2-4-071116**	**AOI6-BH-16-019-2-4-SOIL**	**AOI6-BH-16-022-2-4-SOIL**	**AOI6-BH-16-025-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**07/11/2016**	**04/04/2016**	**07/11/2016**	**04/21/2016**	**04/06/2016**	**04/22/2016**
Sample Depth:		**Direct Contact**		**2.0-2.2 ft**	**2.0-2.5 ft**	**2.0-2.3 ft**	**1.8-3.0 ft**	**2.3-2.5 ft**	**1.9-2.2 ft**
		MSC	**MSC**						
Parameters	**Units**	a	b						
Metals - Total									
Cobalt	mg/kg	190000	160	-	-	-	-	-	-
Lead	mg/kg	190000	450	-	256	-	**1370**[b]	101	64.3
Nickel	mg/kg	190000	650	-	-	-	-	-	-
Vanadium	mg/kg	190000	820	-	-	-	-	-	-
Zinc	mg/kg	190000	12000	-	-	-	-	-	-
General Chemistry									
Percent moisture	%	-	-	30.5	32.5	32.3	24.9	10.9	9.1
pH, lab	s.u.	-	-	-	-	-	-	-	-

Notes:

a PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016.

b PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10)[b] Indicates reporting limit was above the applicable standard.

6.5[A] Concentration exceeds the indicated standard.

SS Lead value is the site specific standard for lead accepted by the PADEP.

ft feet

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-027**	**AOI6-BH-16-029**	**AOI6-BH-16-030**	**AOI6-BH-16-031**	**AOI6-BH-16-032**	**AOI6-BH-16-033**	**AOI6-BH-16-034**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-027-2-4-SOIL**	**AOI6-BH-16-029-2-4-SOIL**	**AOI6-BH-16-030-2-4-SOIL**	**AOI6-BH-16-031-2-4-SOIL**	**AOI6-BH-16-032-2-4-SOIL**	**AOI6-BH-16-033-2-4-SOIL**	**AOI6-BH-16-034-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/13/2016**	**04/13/2016**	**04/14/2016**	**04/14/2016**	**04/13/2016**	**04/13/2016**	**04/13/2016**
Sample Depth:		**Direct Contact**		**2.5-2.8 ft**	**2.3-2.5 ft**	**2.5-2.8 ft**	**2.0-2.5 ft**	**2.0-2.5 ft**	**2.0-2.3 ft**	**2.0-2.3 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	640	35	10	1.0	ND(4.3)	0.960 J	0.70J	ND(0.21)	ND(4.7)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	**ND(5.3)[b]**	**ND(0.28)[b]**	**ND(4.3)[b]**	**ND(2)[b]**	**ND(0.77)[b]**	**ND(0.21)[b]**	**ND(4.7)[b]**
1,2-Dichloroethane	mg/kg	98	0.5	**ND(5.3)[b]**	ND(0.28)	**ND(4.3)[b]**	**ND(2)[b]**	**ND(0.77)[b]**	ND(0.21)	**ND(4.7)[b]**
1,3,5-Trimethylbenzene	mg/kg	10000	210	9.3	0.48	ND(4.3)	0.440 J	0.37 J	ND(0.21)	ND(4.7)
2-Phenylbutane (sec-Butylbenzene)	mg/kg	10000	2800	-	-	-	-	-	-	-
Benzene	mg/kg	330	0.5	**2.500 J[b]**	**4.5[b]**	**130[b]**	**27[b]**	**3.7[b]**	ND(0.21)	**96[b]**
Cyclohexane	mg/kg	10000	6900	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	1000	70	ND(5.3)	0.81	ND(4.3)	2.9	3.6	ND(0.21)	1.2 J
Hexane	mg/kg	10000	5600	-	-	-	-	-	-	-
Isopropyl benzene	mg/kg	10000	2500	360	10	710	180	110	0.130 J	360
Methyl tert butyl ether (MTBE)	mg/kg	9900	2	**ND(5.3)[b]**	ND(0.28)	**ND(4.3)[b]**	ND(2)	ND(0.77)	ND(0.21)	**ND(4.7)[b]**
Naphthalene	mg/kg	190000	25	-	-	-	-	-	-	-
tert-Butylbenzene	mg/kg	10000	2200	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	3.9 J	1.2	20	22	45	ND(0.21)	81
Xylenes (total)	mg/kg	9100	1000	3.3 J	1.5	2.900 J	12	17	ND(0.21)	3.8 J
Semi-Volatile Organic Compounds										
2,4-Dimethylphenol	mg/kg	10000	230	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000	23	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000	1900	-	-	-	-	-	-	-
2-Methylphenol	mg/kg	190000	580	-	-	-	-	-	-	-
4-Methylphenol	mg/kg	190000	58	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000	6	-	-	-	-	-	-	-
Acenaphthene	mg/kg	190000	4700	-	-	-	-	-	-	-
Anthracene	mg/kg	190000	350	3.4	2.2	0.16	0.014 J	0.004 J	0.006 J	ND(0.092)
Benzo(a)anthracene	mg/kg	190000	430	2.3	2.8	0.079	0.014 J	0.014 J	0.026	0.050 J
Benzo(a)pyrene	mg/kg	190000	46	1.7	2.6	0.079	0.012 J	0.013 J	0.028	0.039 J
Benzo(b)fluoranthene	mg/kg	190000	170	1.7	3.5	0.18	0.019	0.021	0.032	0.084 J
Benzo(b)pyridine (Quinoline)	mg/kg	10000	0.37	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	1.0	1.7	0.073	0.008 J	0.016 J	0.029	0.042 J
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	mg/kg	190000	190	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	10000	130	-	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	4.0	3.3	0.094	0.02	0.018 J	0.032	0.095
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-
Diethyl phthalate	mg/kg	10000	9300	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	mg/kg	10000	4900	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000	3200	-	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	6.3	8.4	0.034	0.047	0.008 J	ND(0.018)	0.033 J
Indeno(1,2,3-cd)pyrene	mg/kg	190000	22000	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000	25	7.8	4.8	2.4	0.062	0.029	0.014 J	0.16
Phenanthrene	mg/kg	190000	10000	13	10	3.3	0.059	0.013 J	0.011 J	0.12
Phenol	mg/kg	18000	200	-	-	-	-	-	-	-
Pyrene	mg/kg	190000	2200	6.2	5.8	0.14	0.033	0.025	0.042	0.12
Pyridine	mg/kg	10000	12	-	-	-	-	-	-	-

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-027**	**AOI6-BH-16-029**	**AOI6-BH-16-030**	**AOI6-BH-16-031**	**AOI6-BH-16-032**	**AOI6-BH-16-033**	**AOI6-BH-16-034**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-027-2-4-SOIL**	**AOI6-BH-16-029-2-4-SOIL**	**AOI6-BH-16-030-2-4-SOIL**	**AOI6-BH-16-031-2-4-SOIL**	**AOI6-BH-16-032-2-4-SOIL**	**AOI6-BH-16-033-2-4-SOIL**	**AOI6-BH-16-034-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/13/2016**	**04/13/2016**	**04/14/2016**	**04/14/2016**	**04/13/2016**	**04/13/2016**	**04/13/2016**
Sample Depth:		**Direct Contact**		**2.5-2.8 ft**	**2.3-2.5 ft**	**2.5-2.8 ft**	**2.0-2.5 ft**	**2.0-2.5 ft**	**2.0-2.3 ft**	**2.0-2.3 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Metals - Total										
Cobalt	mg/kg	190000	160	-	-	-	-	-	-	-
Lead	mg/kg	190000	450	90.6	137	34.3	6.19	10.6	9.85	15.3
Nickel	mg/kg	190000	650	-	-	-	-	-	-	-
Vanadium	mg/kg	190000	820	-	-	-	-	-	-	-
Zinc	mg/kg	190000	12000	-	-	-	-	-	-	-
General Chemistry										
Percent moisture	%	-	-	15	10.5	11.6	8.6	9.0	5.7	8.9
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
SS	Lead value is the site specific standard for lead accepted by the PADEP.
ft	feet

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-035**	**AOI6-BH-16-036**	**AOI6-BH-16-037**	**AOI6-BH-16-040**	**AOI6-BH-16-041**	**AOI6-BH-16-043**	**B-172**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-035-2-4-SOIL**	**AOI6-BH-16-036-2-4-SOIL**	**AOI6-BH-16-037-2-4-SOIL**	**AOI6-BH-16-040-2-4-SOIL**	**AOI6-BH-16-041-2-4-SOIL**	**AOI6-BH-16-043-2-4-SOIL**	**AOI6-B-172-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/13/2016**	**04/14/2016**	**04/14/2016**	**04/07/2016**	**04/07/2016**	**04/07/2016**	**04/06/2016**
Sample Depth:		**Direct Contact**		**2.0-2.3 ft**	**2.0-2.3 ft**	**1.8-2.3 ft**	**1.8-2.0 ft**	**1.8-2.3 ft**	**2.0-2.5 ft**	**2.5-3.0 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	640	35	ND(0.004)	ND(4.2)	**ND(97)[b]**	8.1	**47[b]**	0.088 J	ND(0.41)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	ND(0.004)	**ND(4.2)[b]**	**ND(97)[b]**	**ND(4.9)[b]**	**ND(3.2)[b]**	**ND(0.24)[b]**	**ND(0.41)[b]**
1,2-Dichloroethane	mg/kg	98	0.5	ND(0.004)	**ND(4.2)[b]**	**ND(97)[b]**	**ND(4.9)[b]**	**ND(3.2)[b]**	ND(0.24)	ND(0.41)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.004)	ND(4.2)	ND(97)	5.8	22	0.081 J	ND(0.41)
2-Phenylbutane (sec-Butylbenzene)	mg/kg	10000	2800	-	-	-	-	-	-	-
Benzene	mg/kg	330	0.5	0.002 J	**0.700 J[b]**	**850[ab]**	**1.4 J[b]**	**4.3[b]**	**1.3[b]**	ND(0.41)
Cyclohexane	mg/kg	10000	6900	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	1000	70	ND(0.004)	ND(4.2)	**ND(97)[b]**	13	17	0.13 J	ND(0.41)
Hexane	mg/kg	10000	5600	-	-	-	-	-	-	-
Isopropyl benzene	mg/kg	10000	2500	0.083	180	**8500[b]**	6.4	6.4	0.23 J	ND(0.41)
Methyl tert butyl ether (MTBE)	mg/kg	9900	2	ND(0.004)	**ND(4.2)[b]**	**ND(97)[b]**	**ND(4.9)[b]**	**ND(3.2)[b]**	ND(0.24)	ND(0.41)
Naphthalene	mg/kg	190000	25	-	-	-	-	-	-	-
tert-Butylbenzene	mg/kg	10000	2200	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	ND(0.004)	ND(4.2)	**1200[b]**	ND(4.9)	2.5 J	0.32	0.41
Xylenes (total)	mg/kg	9100	1000	ND(0.004)	ND(4.2)	27 J	2.7 J	39	0.56	0.091 J
Semi-Volatile Organic Compounds										
2,4-Dimethylphenol	mg/kg	10000	230	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000	23	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000	1900	-	-	-	-	-	-	-
2-Methylphenol	mg/kg	190000	580	-	-	-	-	-	-	-
4-Methylphenol	mg/kg	190000	58	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000	6	-	-	-	-	-	-	-
Acenaphthene	mg/kg	190000	4700	-	-	-	-	-	-	-
Anthracene	mg/kg	190000	350	0.004 J	0.036	0.11	5.9	2.7	0.29	-
Benzo(a)anthracene	mg/kg	190000	430	0.015 J	0.086	0.05	5.0	5.8	0.9	-
Benzo(a)pyrene	mg/kg	190000	46	0.02	0.088	0.074	4.9	5.3	1.5	-
Benzo(b)fluoranthene	mg/kg	190000	170	0.022	0.12	0.11	6.3	7.8	1.9	-
Benzo(b)pyridine (Quinoline)	mg/kg	10000	0.37	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	0.024	0.083	0.07	3.1	3.9	1.4	-
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	mg/kg	190000	190	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	10000	130	-	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	0.02	0.10	0.053	5.1	5.6	1.1	-
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-
Diethyl phthalate	mg/kg	10000	9300	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	mg/kg	10000	4900	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000	3200	-	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	ND(0.019)	0.010 J	0.033	6.4	2.8	0.090 J	-
Indeno(1,2,3-cd)pyrene	mg/kg	190000	22000	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000	25	ND(0.019)	0.018 J	1.4	**36[b]**	12	0.42	-
Phenanthrene	mg/kg	190000	10000	0.014 J	0.077	3.2	21	13	0.58	-
Phenol	mg/kg	18000	200	-	-	-	-	-	-	-
Pyrene	mg/kg	190000	2200	0.026	0.16	0.084	9.7	11	0.9	-
Pyridine	mg/kg	10000	12	-	-	-	-	-	-	-

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**AOI6-BH-16-035**	**AOI6-BH-16-036**	**AOI6-BH-16-037**	**AOI6-BH-16-040**	**AOI6-BH-16-041**	**AOI6-BH-16-043**	**B-172**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-BH-16-035-2-4-SOIL**	**AOI6-BH-16-036-2-4-SOIL**	**AOI6-BH-16-037-2-4-SOIL**	**AOI6-BH-16-040-2-4-SOIL**	**AOI6-BH-16-041-2-4-SOIL**	**AOI6-BH-16-043-2-4-SOIL**	**AOI6-B-172-2-4-SOIL**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**04/13/2016**	**04/14/2016**	**04/14/2016**	**04/07/2016**	**04/07/2016**	**04/07/2016**	**04/06/2016**
Sample Depth:		**Direct Contact**		**2.0-2.3 ft**	**2.0-2.3 ft**	**1.8-2.3 ft**	**1.8-2.0 ft**	**1.8-2.3 ft**	**2.0-2.5 ft**	**2.5-3.0 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Metals - Total										
Cobalt	mg/kg	190000	160	-	-	-	-	-	-	-
Lead	mg/kg	190000	450	10.9	18.9	105	142	196	**1720**[b]	208
Nickel	mg/kg	190000	650	-	-	-	-	-	-	-
Vanadium	mg/kg	190000	820	-	-	-	-	-	-	-
Zinc	mg/kg	190000	12000	-	-	-	-	-	-	-
General Chemistry										
Percent moisture	%	-	-	9.4	8	14.4	8.4	17.9	9.3	42.4
pH, lab	s.u.	-	-	-	-	-	8.09	7.86	8.84	-

Notes:

a	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016.
b	PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)[b]	Indicates reporting limit was above the applicable standard.
6.5[A]	Concentration exceeds the indicated standard.
SS	Lead value is the site specific standard for lead accepted by the PADEP.
ft	feet

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**B-172**	**B-173**	**B-173**	**B-174**	**B-174**	**B-175**	**B-175**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-B-172-2-4-071216**	**AOI6-B-173-2-4-SOIL**	**AOI6-B-173-2-4-071316**	**AOI6-B-174-2-4-SOIL**	**AOI6-B-174-2-4-071316**	**AOI6-B-175-2-4-SOIL**	**AOI6-B-175-2-4-071316**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**07/12/2016**	**04/05/2016**	**07/13/2016**	**04/04/2016**	**07/13/2016**	**04/05/2016**	**07/13/2016**
Sample Depth:		**Direct Contact**		**2.5-3.0 ft**	**3.5-4.0 ft**	**3.5-4.0 ft**	**3.5-4.0 ft**	**3.5-4.0 ft**	**2.7-3.0 ft**	**2.7-3.0 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	640	35	-	ND(0.33)	-	ND(0.005)	-	0.88	-
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	-	**ND(0.33)[b]**	-	ND(0.005)	-	**ND(0.34)[b]**	-
1,2-Dichloroethane	mg/kg	98	0.5	-	ND(0.33)	-	ND(0.005)	-	ND(0.34)	-
1,3,5-Trimethylbenzene	mg/kg	10000	210	-	ND(0.33)	-	ND(0.005)	-	1.5	-
2-Phenylbutane (sec-Butylbenzene)	mg/kg	10000	2800	-	-	-	-	-	-	-
Benzene	mg/kg	330	0.5	-	0.054 J	-	0.005	-	0.21 J	-
Cyclohexane	mg/kg	10000	6900	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	1000	70	-	ND(0.33)	-	ND(0.005)	-	0.23 J	-
Hexane	mg/kg	10000	5600	-	-	-	-	-	-	-
Isopropyl benzene	mg/kg	10000	2500	-	ND(0.33)	-	ND(0.005)	-	0.58	-
Methyl tert butyl ether (MTBE)	mg/kg	9900	2	-	ND(0.33)	-	ND(0.005)	-	ND(0.34)	-
Naphthalene	mg/kg	190000	25	-	-	-	-	-	-	-
tert-Butylbenzene	mg/kg	10000	2200	-	-	-	-	-	-	-
Toluene	mg/kg	10000	100	-	0.38	-	0.001 J	-	0.5	-
Xylenes (total)	mg/kg	9100	1000	-	0.074 J	-	ND(0.005)	-	2.2	-
Semi-Volatile Organic Compounds										
2,4-Dimethylphenol	mg/kg	10000	230	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000	23	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000	1900	-	-	-	-	-	-	-
2-Methylphenol	mg/kg	190000	580	-	-	-	-	-	-	-
4-Methylphenol	mg/kg	190000	58	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000	6	-	-	-	-	-	-	-
Acenaphthene	mg/kg	190000	4700	-	-	-	-	-	-	-
Anthracene	mg/kg	190000	350	0.27	-	0.19 J	-	0.14 J	-	4.3
Benzo(a)anthracene	mg/kg	190000	430	0.48	-	0.45	-	0.63	-	5.6
Benzo(a)pyrene	mg/kg	190000	46	0.36	-	0.45	-	0.52	-	4.4
Benzo(b)fluoranthene	mg/kg	190000	170	0.50	-	0.63	-	0.65	-	7.7
Benzo(b)pyridine (Quinoline)	mg/kg	10000	0.37	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	0.23	-	0.47	-	0.40	-	3.3
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	mg/kg	190000	190	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	10000	130	-	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	0.51	-	0.65	-	0.67	-	5.6
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-
Diethyl phthalate	mg/kg	10000	9300	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	mg/kg	10000	4900	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000	3200	-	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	0.11	-	0.16 J	-	0.041 J	-	8.4
Indeno(1,2,3-cd)pyrene	mg/kg	190000	22000	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000	25	0.12	-	1.2	-	0.14 J	-	3.9
Phenanthrene	mg/kg	190000	10000	0.79	-	0.88	-	0.53	-	22
Phenol	mg/kg	18000	200	-	-	-	-	-	-	-
Pyrene	mg/kg	190000	2200	0.78	-	0.81	-	1.0	-	6.3
Pyridine	mg/kg	10000	12	-	-	-	-	-	-	-

Table 3b

Sub-Surface Soil Analytical Results Summary
Statewide Health Standards
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		**Act 2**	**Act 2**	**B-172**	**B-173**	**B-173**	**B-174**	**B-174**	**B-175**	**B-175**
Sample ID:		**Non-Residential**	**Non-Residential**	**AOI6-B-172-2-4-071216**	**AOI6-B-173-2-4-SOIL**	**AOI6-B-173-2-4-071316**	**AOI6-B-174-2-4-SOIL**	**AOI6-B-174-2-4-071316**	**AOI6-B-175-2-4-SOIL**	**AOI6-B-175-2-4-071316**
Sample Date:		**Used Aquifer**	**Used Aquifer**	**07/12/2016**	**04/05/2016**	**07/13/2016**	**04/04/2016**	**07/13/2016**	**04/05/2016**	**07/13/2016**
Sample Depth:		**Direct Contact**		**2.5-3.0 ft**	**3.5-4.0 ft**	**3.5-4.0 ft**	**3.5-4.0 ft**	**3.5-4.0 ft**	**2.7-3.0 ft**	**2.7-3.0 ft**
		MSC	**MSC**							
Parameters	**Units**	a	b							
Metals - Total										
Cobalt	mg/kg	190000	160	-	-	-	-	-	-	-
Lead	mg/kg	190000	450	-	315	-	**1360**[b]	-	255	-
Nickel	mg/kg	190000	650	-	-	-	-	-	-	-
Vanadium	mg/kg	190000	820	-	-	-	-	-	-	-
Zinc	mg/kg	190000	12000	-	-	-	-	-	-	-
General Chemistry										
Percent moisture	%	-	-	16.7	34.3	14.4	24.2	15.1	37.5	29.6
pH, lab	s.u.	-	-	-	-	-	-	-	-	-

Notes:

a PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016.

b PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10)[b] Indicates reporting limit was above the applicable standard.

6.5[A] Concentration exceeds the indicated standard.

SS Lead value is the site specific standard for lead accepted by the PADEP.

ft feet

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-104	AOI6 BH-12-106	AOI6 BH-12-107	AOI6 BH-12-108	AOI6 BH-12-111		AOI6 BH-12-112	AOI6 BH-12-114	AOI6 BH-12-115	AOI6 BH-12-119	AOI6 BH-12-120	AOI6 BH-12-122
Sample Date				4-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	4-Dec-12	4-Dec-12	3-Dec-12
Sample ID				BH-12-104_0.5-1'	BH-12-106_1-1.5'	BH-12-107_1-1.5'	BH-12-108_1'	BH-12-111_0.5-1'	BH-12-111_1-1.5'	BH-12-112_0.5-1'	BH-12-114_1-1.5'	BH-12-115_1-2'	BH-12-119_0.5-1'	BH-12-120_0-1'	BH-12-122_1-1.5'
Sample Depth				0.5 - 1 ft	1 - 1.5 ft	1 - 1.5 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	0.5 - 1 ft	1 - 1.5 ft	1 - 2 ft	0.5 - 1 ft	0 - 1 ft	1 - 1.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22962	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22962	JB22962	JB22822
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-14	JB22822-8	JB22822-2	JB22822-6	JB22822-10	JB22822-11	JB22822-1	JB22822-15	JB22822-12	JB22962-11	JB22962-13	JB22822-18
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	ND (0.063) (0.0075)	***88.2***[B] (0.076)	0.0124 (0.00011)	***23.6***[B] (0.030)	0.207 J (0.030)	0.404 (0.027)	0.0016 (0.00011)	ND (0.00094) (0.00011)	0.0013 (0.00011)	0.00056 J (0.00012)	ND (0.0013) (0.00015)	0.0034 (0.00011)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.063)* (0.0080)	*ND (0.064)* (0.0081)	ND (0.00092) (0.00012)	*ND (0.25)* (0.032)	*ND (0.25)* (0.032)	*ND (0.23)* (0.029)	ND (0.00095) (0.00012)	ND (0.00094) (0.00012)	ND (0.00094) (0.00012)	ND (0.0010) (0.00013)	ND (0.0013) (0.00016)	ND (0.00088) (0.00011)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.063) (0.0085)	ND (0.064) (0.0086)	ND (0.00092) (0.00012)	ND (0.25) (0.034)	ND (0.25) (0.033)	ND (0.23) (0.031)	ND (0.00095) (0.00013)	ND (0.00094) (0.00013)	ND (0.00094) (0.00013)	ND (0.0010) (0.00014)	ND (0.0013) (0.00017)	ND (0.00088) (0.00012)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.063) (0.017)	0.452 (0.017)	0.00039 J (0.00024)	57.1 (1.3)	0.0992 J (0.065)	0.116 J (0.061)	0.00044 J (0.00025)	ND (0.00094) (0.00025)	ND (0.00094) (0.00025)	ND (0.0010) (0.00027)	ND (0.0013) (0.00033)	0.0021 (0.00023)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	0.0351 J (0.0047)	31.2 (0.048)	0.00026 J (0.000069)	25.2 (0.019)	0.295 J (0.018)	0.200 J (0.017)	ND (0.0048) (0.000071)	ND (0.0047) (0.000070)	ND (0.0047) (0.000070)	0.00026 J (0.000076)	ND (0.0063) (0.000093)	0.0082 (0.000066)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.063) (0.015)	ND (0.064) (0.015)	ND (0.00092) (0.00022)	ND (0.25) (0.059)	ND (0.25) (0.058)	ND (0.23) (0.054)	ND (0.00095) (0.00022)	ND (0.00094) (0.00022)	ND (0.00094) (0.00022)	ND (0.0010) (0.00024)	ND (0.0013) (0.00029)	ND (0.00088) (0.00021)
Naphthalene	mg/kg	760[A]	25[B]	ND (0.32) (0.0077)	0.994 (0.0078)	ND (0.0046) (0.00011)	***25.9***[B] (0.031)	0.282 J (0.030)	0.285 J (0.028)	ND (0.0048) (0.00012)	ND (0.0047) (0.00011)	ND (0.0047) (0.00011)	ND (0.0051) (0.00012)	ND (0.0063) (0.00015)	0.0051 (0.00011)
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.0154 J (0.0066)	5.34 (0.0067)	0.0017 (0.000097)	10.3 (0.026)	0.172 J (0.026)	0.217 J (0.024)	0.0022 (0.00010)	ND (0.00094) (0.000099)	0.00045 J (0.000099)	ND (0.0010) (0.00011)	ND (0.0013) (0.00013)	0.0033 (0.000093)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	ND (0.32) (0.013)	0.717 (0.013)	ND (0.0046) (0.00019)	***306***[B] (1.0)	0.301 J (0.052)	0.277 J (0.048)	ND (0.0048) (0.00020)	0.00055 J (0.00020)	ND (0.0047) (0.00020)	ND (0.0051) (0.00021)	ND (0.0063) (0.00026)	0.0079 (0.00018)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.32) (0.010)	0.272 J (0.010)	ND (0.0046) (0.00015)	119 (0.80)	0.624 J (0.040)	0.0943 J (0.037)	ND (0.0048) (0.00015)	ND (0.0047) (0.00015)	ND (0.0047) (0.00015)	ND (0.0051) (0.00016)	ND (0.0063) (0.00020)	0.0049 (0.00014)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.063) (0.0088)	1.14 (0.0089)	0.00094 (0.00013)	314 (0.70)	0.638 (0.034)	0.652 (0.032)	0.00062 J (0.00013)	0.00044 J (0.00013)	0.00052 J (0.00013)	0.00037 J (0.00014)	ND (0.0013) (0.00017)	0.0080 (0.00012)
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	ND (0.038) (0.013)	1.24 (0.060)	0.715 (0.024)	1.70 (0.011)	0.472 (0.061)	0.0920 J (0.057)	0.151 (0.012)	0.0343 J (0.012)	0.224 (0.013)	0.219 (0.026)	0.185 (0.015)	0.210 (0.011)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	0.0863 (0.012)	3.68 (0.056)	2.32 (0.022)	4.55 (0.21)	1.10 (0.057)	0.171 (0.053)	0.411 (0.011)	0.0569 (0.011)	0.499 (0.012)	0.266 (0.024)	0.127 (0.014)	0.589 (0.010)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	0.0630 (0.012)	4.06 (0.052)	2.61 (0.021)	4.83 (0.20)	1.43 (0.053)	0.142 J (0.050)	0.484 (0.010)	0.0748 (0.011)	0.783 (0.011)	0.320 (0.023)	0.118 (0.013)	0.816 (0.0097)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	0.103 (0.013)	4.41 (0.057)	2.32 (0.023)	2.89 (0.011)	0.924 (0.058)	0.119 J (0.055)	0.626 (0.011)	0.0956 (0.012)	0.333 (0.012)	0.395 (0.025)	0.198 (0.014)	0.874 (0.011)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.0866 (0.014)	2.17 (0.064)	1.81 (0.026)	3.54 (0.24)	1.44 (0.065)	0.127 J (0.061)	0.335 (0.013)	0.100 (0.013)	0.766 (0.013)	0.587 (0.027)	0.555 (0.016)	0.915 (0.012)
Chrysene	mg/kg	760[A]	230[B]	0.0989 (0.013)	3.49 (0.058)	2.37 (0.023)	5.36 (0.22)	2.93 (0.059)	0.258 (0.055)	0.557 (0.012)	0.0876 (0.012)	1.03 (0.012)	0.295 (0.025)	0.236 (0.015)	0.730 (0.011)
Fluorene	mg/kg	130000[A]	3800[B]	ND (0.038) (0.013)	1.02 (0.056)	0.439 (0.022)	15.2 (0.21)	1.23 (0.057)	0.641 (0.054)	0.206 (0.011)	0.0227 J (0.012)	0.0803 (0.012)	0.0540 J (0.024)	0.0220 J (0.014)	0.0605 (0.010)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	0.0288 J (0.017)	5.80 (0.078)	3.02 (0.031)	14.9 (0.29)	1.74 (0.079)	0.680 (0.074)	0.510 (0.016)	0.0550 (0.016)	0.200 (0.016)	0.170 (0.034)	0.243 (0.020)	0.456 (0.015)
Pyrene	mg/kg	96000[A]	2200[B]	0.0825 (0.015)	6.80 (0.066)	5.05 (0.026)	7.95 (0.25)	3.64 (0.067)	0.588 (0.063)	0.718 (0.013)	0.103 (0.013)	1.57 (0.014)	0.301 (0.028)	0.300 (0.017)	0.937 (0.012)
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	161 (0.14)	***897***[B] (0.13)	221 (0.12)	380 (0.13)	163 (0.13)	34.6 (0.11)	427 (0.26)	49.1 (0.24)	126 (0.28)	237 (0.14)	309 (0.15)	75.2 (0.12)
General Chemistry															
Moisture, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	82.3 ()	83.0 ()	87.3 ()	87.2 ()	89.4 ()	93.9 ()	83.5 ()	88.5 ()	81.9 ()	81.9 ()	73.8 ()	91.2 ()

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-123	AOI6 BH-12-129	AOI6 BH-12-130	AOI6 BH-12-131	AOI6 BH-12-135	AOI6 BH-12-136	AOI6 BH-12-137	AOI6 BH-12-138	AOI6 BH-12-139	AOI6 BH-12-140	AOI6 BH-12-144	AOI6 BH-12-146
Sample Date				4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12
Sample ID				BH-12-123_1-1.5'	BH-12-129_1.5-2'	BH-12-130_1-2'	BH-12-131_1-2'	BH-12-135_1-1.5'	BH-12-136_1-1.5'	BH-12-137_0-1'	BH-12-138_0-1'	BH-12-139_1-1.5'	BH-12-140_0-0.5'	BH-12-144_0-0.5'	BH-12-146_0-1'
Sample Depth				1 - 1.5 ft	1.5 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	0 - 1 ft	0 - 1 ft	1 - 1.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 1 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22962	JB22962	JB22962	JB22962	JB23100	JB23100	JB23100	JB23100	JB23100	JB23100	JB23100	JB23100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-1	JB22962-6	JB22962-15	JB22962-16	JB23100-11	JB23100-9	JB23100-10	JB23100-6	JB23100-8	JB23100-3	JB23100-5	JB23100-4
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	ND (0.0010) (0.00012)	***91.6***[B] (0.57)	0.337 J (0.060)	0.110 (0.0068)	ND (0.00091) (0.00011)	ND (0.00084) (0.000099)	ND (0.00091) (0.00011)	ND (0.0015) (0.00018)	ND (0.00097) (0.00012)	ND (0.0012) (0.00014)	ND (0.00083) (0.000098)	ND (0.00098) (0.00012)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.0010) (0.00013)	*ND (0.048)* (0.0061)	*ND (0.50)* (0.064)	*ND (0.057)* (0.0072)	ND (0.00091) (0.00012)	ND (0.00084) (0.00011)	ND (0.00091) (0.00012)	ND (0.0015) (0.00019)	ND (0.00097) (0.00012)	ND (0.0012) (0.00015)	ND (0.00083) (0.00010)	ND (0.00098) (0.00012)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.0010) (0.00014)	ND (0.048) (0.0064)	ND (0.50) (0.068)	ND (0.057) (0.0077)	ND (0.00091) (0.00012)	ND (0.00084) (0.00011)	ND (0.00091) (0.00012)	ND (0.0015) (0.00020)	ND (0.00097) (0.00013)	ND (0.0012) (0.00016)	ND (0.00083) (0.00011)	ND (0.00098) (0.00013)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.0010) (0.00027)	0.837 (0.013)	ND (0.50) (0.13)	0.136 (0.015)	ND (0.00091) (0.00024)	ND (0.00084) (0.00022)	ND (0.00091) (0.00024)	ND (0.0015) (0.00039)	ND (0.00097) (0.00025)	ND (0.0012) (0.00031)	ND (0.00083) (0.00022)	ND (0.00098) (0.00026)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	0.00034 J (0.000077)	311 (0.35)	32.9 (0.037)	0.245 J (0.0042)	ND (0.0045) (0.000068)	ND (0.0042) (0.000062)	ND (0.0046) (0.000068)	ND (0.0074) (0.00011)	ND (0.0048) (0.000072)	ND (0.0059) (0.000087)	ND (0.0041) (0.000061)	ND (0.0049) (0.000073)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.0010) (0.00024)	ND (0.048) (0.011)	ND (0.50) (0.12)	ND (0.057) (0.013)	ND (0.00091) (0.00021)	ND (0.00084) (0.00020)	ND (0.00091) (0.00021)	ND (0.0015) (0.00035)	ND (0.00097) (0.00023)	ND (0.0012) (0.00028)	ND (0.00083) (0.00019)	ND (0.00098) (0.00023)
Naphthalene	mg/kg	760[A]	25[B]	ND (0.0052) (0.00013)	0.0543 J (0.0058)	ND (2.5) (0.061)	0.360 (0.0069)	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	ND (0.0010) (0.00011)	***116***[B] (0.50)	0.175 J (0.053)	0.211 (0.0060)	ND (0.00091) (0.000095)	ND (0.00084) (0.000088)	ND (0.00091) (0.000096)	ND (0.0015) (0.00016)	ND (0.00097) (0.00010)	ND (0.0012) (0.00012)	ND (0.00083) (0.000087)	ND (0.00098) (0.00010)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	ND (0.0052) (0.00022)	0.705 (0.010)	ND (2.5) (0.11)	0.0814 J (0.012)	ND (0.0045) (0.00019)	ND (0.0042) (0.00017)	ND (0.0046) (0.00019)	ND (0.0074) (0.00031)	ND (0.0048) (0.00020)	ND (0.0059) (0.00025)	ND (0.0041) (0.00017)	ND (0.0049) (0.00020)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.0052) (0.00017)	0.257 (0.0076)	ND (2.5) (0.081)	0.0211 J (0.0091)	ND (0.0045) (0.00015)	ND (0.0042) (0.00013)	ND (0.0046) (0.00015)	ND (0.0074) (0.00024)	ND (0.0048) (0.00015)	ND (0.0059) (0.00019)	ND (0.0041) (0.00013)	ND (0.0049) (0.00016)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.0010) (0.00014)	3.69 (0.0066)	ND (0.50) (0.070)	0.216 (0.0079)	ND (0.00091) (0.00013)	ND (0.00084) (0.00012)	ND (0.00091) (0.00013)	ND (0.0015) (0.00021)	ND (0.00097) (0.00013)	ND (0.0012) (0.00016)	ND (0.00083) (0.00011)	ND (0.00098) (0.00014)
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	0.597 (0.014)	ND (0.033) (0.012)	3.58 (0.25)	0.0602 (0.012)	ND (0.037) (0.013)	0.0941 (0.012)	0.142 (0.013)	0.118 (0.014)	0.0718 (0.013)	0.290 (0.012)	ND (0.033) (0.012)	0.0787 (0.013)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	1.79 (0.013)	0.0699 (0.011)	3.52 (0.012)	0.0983 (0.012)	0.0614 (0.012)	0.267 (0.011)	0.374 (0.012)	0.145 (0.013)	0.214 (0.012)	0.0701 (0.012)	0.0373 (0.011)	0.603 (0.012)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	2.11 (0.012)	0.0627 (0.010)	6.52 (0.22)	0.116 (0.011)	0.0757 (0.011)	0.234 (0.011)	0.296 (0.011)	0.168 (0.013)	0.221 (0.011)	0.0915 (0.011)	0.0397 (0.010)	1.02 (0.012)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	2.15 (0.013)	0.0687 (0.011)	11.3 (0.24)	0.0976 (0.012)	0.0894 (0.012)	0.265 (0.012)	0.307 (0.012)	0.215 (0.014)	0.240 (0.012)	0.103 (0.012)	0.0560 (0.011)	1.36 (0.013)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	1.59 (0.014)	0.0498 (0.012)	4.33 (0.27)	0.178 (0.013)	0.0597 (0.014)	0.122 (0.013)	0.141 (0.013)	0.169 (0.015)	0.144 (0.013)	0.0844 (0.013)	0.0289 J (0.012)	0.982 (0.014)
Chrysene	mg/kg	760[A]	230[B]	1.87 (0.013)	0.0711 (0.011)	9.88 (0.25)	0.136 (0.012)	0.0655 (0.012)	0.237 (0.012)	0.332 (0.012)	0.148 (0.014)	0.219 (0.012)	0.0825 (0.012)	0.0422 (0.011)	0.818 (0.013)
Fluorene	mg/kg	130000[A]	3800[B]	0.307 (0.013)	ND (0.033) (0.011)	34.6 (0.24)	0.122 (0.012)	ND (0.037) (0.012)	0.0334 J (0.012)	0.0342 J (0.012)	ND (0.041) (0.014)	ND (0.036) (0.012)	ND (0.036) (0.012)	ND (0.033) (0.011)	0.0195 J (0.012)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	ND (0.037) (0.010)	ND (0.035) (0.0096)	ND (0.036) (0.0098)	0.0191 J (0.011)	0.0204 J (0.0098)	ND (0.036) (0.0097)	ND (0.033) (0.0090)	0.0158 J (0.010)
Phenanthrene	mg/kg	190000[A]	10000[B]	1.49 (0.018)	0.0395 (0.015)	10.0 (0.33)	0.174 (0.016)	0.0353 J (0.017)	0.373 (0.016)	0.556 (0.016)	0.138 (0.019)	0.260 (0.016)	0.0474 (0.016)	0.0219 J (0.015)	0.329 (0.017)
Pyrene	mg/kg	96000[A]	2200[B]	2.51 (0.015)	0.121 (0.013)	12.1 (0.28)	0.140 (0.014)	0.0708 (0.014)	0.415 (0.014)	0.594 (0.014)	0.202 (0.016)	0.340 (0.014)	0.108 (0.014)	0.0613 (0.013)	1.36 (0.015)
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	224 (0.14)	48.0 (0.12)	84.4 (0.13)	111 (0.13)	106 (0.12)	***853***[B] (0.25)	137 (0.28)	***483***[B] (0.13)	***1120***[B] (0.13)	***766***[B] (0.44)	17.1 (0.12)	184 (0.13)
General Chemistry															
Moisture, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	84.4 ()	90.0 ()	87.0 ()	85.1 ()	87.3 ()	88.0 ()	85.5 ()	80.0 ()	84.8 ()	78.7 ()	91.8 ()	86.5 ()

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-147	AOI6 BH-12-148	AOI6 BH-12-149	AOI6-BH-16-001	AOI6-BH-16-002	AOI6-BH-16-003	AOI6-BH-16-004			AOI6-BH-16-005	AOI6-BH-16-006	
Sample Date				5-Dec-12	5-Dec-12	4-Dec-12	12-Apr-16	12-Apr-16	12-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	12-Apr-16	22-Apr-16	22-Apr-16
Sample ID				BH-12-147_1-1.5'	BH-12-148_0-1'	BH-12-149_1-1.5'	AOI6-BH-16-001-0-2-SOIL	AOI6-BH-16-002-0-2-SOIL	AOI6-BH-16-003-0-2-SOIL	AOI6-BH16-DUP-SOIL-002	AOI6-BH-16-004-0-2-SOIL	AOI6-BH-16-004-2-4-SOIL	AOI6-BH-16-005-0-2-SOIL	AOI6-BH-16-006-0-2-SOIL	AOI6-BH-16-006-2-4-SOIL
Sample Depth				1 - 1.5 ft	0 - 1 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	0 - 0.5 ft		0.75 - 1.75 ft	1.75 - 2.3 ft	0 - 0.5 ft	1 - 1.5 ft	1.5 - 2.25 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	JB23100	JB23100	JB22962	1651423	1651423	1651423	1653975	1653975	1653975	1651423	1653975	1653975
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB23100-2	JB23100-1	JB22962-4	8336826	8336823	8336825	8349806	8349805	8349807	8336824	8349808	8349809
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	ND (0.00089) (0.00011)	ND (0.0011) (0.00013)	0.0506 J (0.0083)	0.002 J (0.0005)	0.001 J (0.0005)	ND (0.005) (0.0005)	0.002 J (0.0005)	0.001 J (0.0005)	0.001 J (0.0005)	0.0004 J (0.0005)	ND (0.280) (0.028)	0.023 J (0.022)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.00089) (0.00011)	ND (0.0011) (0.00014)	*ND (0.070)* (0.0088)	*ND (0.006)* (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	*ND (0.280)* (0.055)	*ND (0.220)* (0.044)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.00089) (0.00012)	ND (0.0011) (0.00014)	ND (0.070) (0.0094)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.00089) (0.00023)	ND (0.0011) (0.00028)	ND (0.070) (0.018)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	0.001 J (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.0044) (0.000066)	ND (0.0053) (0.000079)	0.147 J (0.0052)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.00089) (0.00021)	ND (0.0011) (0.00025)	ND (0.070) (0.016)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.280) (0.028)	ND (0.220) (0.022)
Naphthalene	mg/kg	760[A]	25[B]	-	-	ND (0.35) (0.0085)	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	ND (0.00089) (0.000093)	ND (0.0011) (0.00011)	0.0223 J (0.0073)	0.003 J (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	0.003 J (0.001)	0.003 J (0.0009)	0.002 J (0.0009)	ND (0.004) (0.001)	0.088 J (0.055)	0.073 J (0.044)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	ND (0.0044) (0.00019)	ND (0.0053) (0.00022)	ND (0.35) (0.015)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	0.002 J (0.001)	0.0009 J (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.0044) (0.00014)	ND (0.0053) (0.00017)	ND (0.35) (0.011)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.00089) (0.00012)	ND (0.0011) (0.00015)	ND (0.070) (0.0097)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	0.005 J (0.001)	0.004 J (0.0009)	0.001 J (0.0009)	ND (0.004) (0.001)	0.063 J (0.055)	0.065 J (0.044)
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	0.0166 J (0.012)	0.155 (0.014)	ND (0.037) (0.013)	0.730 (0.003)	0.340 (0.003)	0.410 (0.003)	0.600 (0.008)	0.430 (0.008)	0.550 (0.007)	0.016 J (0.003)	0.700 (0.008)	0.430 (0.007)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	0.0519 (0.011)	0.328 (0.013)	0.0518 (0.012)	0.950 (0.003)	1.700 (0.003)	1.900 (0.003)	1.700 (0.008)	1.100 (0.008)	1.600 (0.007)	0.110 (0.003)	1.200 (0.008)	0.750 (0.007)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	0.0650 (0.010)	0.327 (0.013)	0.0576 (0.011)	1.100 (0.003)	1.700 (0.003)	1.900 (0.003)	1.500 (0.008)	1.100 (0.008)	1.500 (0.007)	0.130 (0.003)	1.200 (0.008)	0.740 (0.007)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	0.0787 (0.011)	0.334 (0.014)	0.0670 (0.012)	1.500 (0.003)	2.200 (0.003)	2.600 (0.003)	1.900 (0.008)	1.300 (0.008)	1.700 (0.007)	0.180 (0.003)	1.300 (0.008)	1.000 (0.007)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.0542 (0.013)	0.205 (0.015)	0.0459 (0.014)	1.300 (0.003)	0.850 (0.003)	1.500 (0.003)	0.940 (0.008)	0.700 (0.008)	0.840 (0.007)	0.150 (0.003)	0.760 (0.008)	0.520 (0.007)
Chrysene	mg/kg	760[A]	230[B]	0.0608 (0.012)	0.307 (0.014)	0.0640 (0.013)	1.100 (0.003)	1.700 (0.003)	1.900 (0.003)	1.700 (0.008)	1.100 (0.008)	1.500 (0.007)	0.120 (0.003)	1.300 (0.008)	0.820 (0.007)
Fluorene	mg/kg	130000[A]	3800[B]	ND (0.034) (0.011)	0.0308 J (0.014)	ND (0.037) (0.012)	0.320 (0.003)	0.079 J (0.003)	0.110 (0.003)	0.190 (0.008)	0.160 (0.008)	0.200 (0.007)	0.005 J (0.003)	0.360 (0.008)	0.270 (0.007)
Naphthalene	mg/kg	760[A]	25[B]	ND (0.034) (0.0093)	ND (0.041) (0.011)	-	6.900 (0.003)	0.630 (0.003)	0.510 (0.003)	1.300 (0.008)	1.200 (0.008)	1.100 (0.007)	0.025 (0.003)	1.600 (0.008)	1.600 (0.007)
Phenanthrene	mg/kg	190000[A]	10000[B]	0.0321 J (0.016)	0.425 (0.019)	0.0283 J (0.017)	2.000 (0.003)	0.870 (0.003)	1.700 (0.003)	1.700 (0.008)	1.100 (0.008)	1.200 (0.007)	0.053 (0.003)	1.500 (0.008)	1.100 (0.007)
Pyrene	mg/kg	96000[A]	2200[B]	0.0774 (0.013)	0.469 (0.016)	0.0804 (0.014)	1.600 (0.003)	2.000 (0.003)	2.800 (0.003)	2.300 (0.008)	1.300 (0.008)	1.900 (0.007)	0.150 (0.003)	2.000 (0.008)	1.200 (0.007)
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	286 (0.13)	***745*** [B] (0.13)	27.9 (0.14)	288 (0.510)	180 (0.510)	***549*** [B] (0.510)	***529*** [B] (0.452)	399 (0.411)	189 (0.398)	68.7 (0.510)	142 (0.510)	225 (0.435)
General Chemistry															
Moisture, Percent	%	n/v	n/v	-	-	-	14.6 (0.50)	24.8 (0.50)	12.2 (0.50)	12.5 (0.50)	13.2 (0.50)	11.0 (0.50)	4.9 (0.50)	14.5 (0.50)	11.8 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	90.9 ()	80.7 ()	81.3 ()	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-007	AOI6-BH-16-008	AOI6-BH-16-009	AOI6-BH-16-010	AOI6-BH-16-011	AOI6-BH-16-012		AOI6-BH-16-013	AOI6-BH-16-014		AOI6-BH-16-015	
Sample Date				8-Apr-16	8-Apr-16	8-Apr-16	11-Apr-16	11-Apr-16	11-Apr-16	11-Apr-16	11-Apr-16	5-Apr-16	11-Jul-16	5-Apr-16	11-Jul-16
Sample ID				AOI6-BH-16-007-0-2-SOIL	AOI6-BH-16-008-0-2-SOIL	AOI6-BH-16-009-0-2-SOIL	AOI6-BH-16-010-0-2-SOIL	AOI6-BH-16-011-0-2-SOIL	AOI6-BH16-012-0-2-SOIL-B	AOI6-BH-16-012-0-2-SOIL	AOI6-BH-16-013-0-2-SOIL	AOI6-BH-16-014-0-2-SOIL	AOI6-BH-16-014-0-2-071116	AOI6-BH-16-015-0-2-SOIL	AOI6-BH-16-015-0-2-071116
Sample Depth				1 - 2 ft	1 - 2 ft	1.5 - 1.75 ft	0.5 - 0.9 ft	0.5 - 0.83 ft	0.5 - 1 ft	1 - 1.1 ft	0.5 - 1 ft	1 - 1.5 ft	1.25 - 1.83 ft	1.5 - 2 ft	1 - 1.41 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1649742	1649742	1649742	1649742	1649742	1649742	1649742	1649742	1647893	1682991	1647893	1682991
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8329537	8329540	8329542	8329545	8329546	8329549	8329548	8329550	8321192	8475490	8321190	8475488
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	0.003 J (0.0005)	0.001 J (0.0005)	0.005 J (0.0005)	0.011 (0.0005)	ND (0.270) (0.0005)	ND (0.250) (0.0005)	ND (0.230) (0.0005)	ND (0.230) (0.0005)	0.240 J (0.0005)	-	0.053 J (0.0005)	-
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.006)* (0.001)	ND (0.005) (0.001)	*ND (0.006)* (0.001)	ND (0.005) (0.001)	*ND (0.270)* (0.001)	*ND (0.250)* (0.001)	*ND (0.230)* (0.001)	*ND (0.230)* (0.001)	*ND (0.330)* (0.001)	-	*ND (0.330)* (0.001)	-
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	ND (0.330) (0.001)	-	ND (0.330) (0.001)	-
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	0.095 J (0.001)	-	ND (0.330) (0.001)	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.270) (0.001)	2.000 (0.001)	0.250 (0.001)	ND (0.230) (0.001)	ND (0.330) (0.001)	-	0.770 (0.001)	-
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.270) (0.0005)	ND (0.250) (0.0005)	ND (0.230) (0.0005)	ND (0.230) (0.0005)	ND (0.330) (0.0005)	-	ND (0.330) (0.0005)	-
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	0.004 J (0.001)	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	0.260 J (0.001)	-	0.130 J (0.001)	-
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	0.110 J (0.001)	-	0.110 J (0.001)	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	ND (0.330) (0.001)	-	ND (0.330) (0.001)	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.270) (0.001)	0.061 J (0.001)	0.047 J (0.001)	ND (0.230) (0.001)	0.280 J (0.001)	-	0.470 (0.001)	-
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	0.200 (0.003)	2.300 (0.003)	4.300 (0.003)	0.079 (0.003)	1.700 (0.003)	1.300 (0.003)	0.690 (0.003)	0.400 (0.003)	-	6.200 (0.003)	-	5.400 (0.003)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	0.720 (0.003)	5.500 (0.003)	5.200 (0.003)	0.210 (0.003)	0.990 (0.003)	0.940 (0.003)	1.900 (0.003)	0.460 (0.003)	-	7.800 (0.003)	-	2.000 J (0.003)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	0.670 (0.003)	4.800 (0.003)	3.300 (0.003)	0.260 (0.003)	0.990 (0.003)	0.890 (0.003)	1.800 (0.003)	0.280 (0.003)	-	8.300 (0.003)	-	1.600 J (0.003)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	0.950 (0.003)	6.300 (0.003)	4.000 (0.003)	0.410 (0.003)	1.300 (0.003)	1.600 (0.003)	2.300 (0.003)	0.340 (0.003)	-	8.200 (0.003)	-	2.900 (0.003)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.510 (0.003)	3.300 (0.003)	1.900 (0.003)	0.230 (0.003)	0.690 (0.003)	0.740 (0.003)	1.400 (0.003)	0.210 (0.003)	-	6.300 (0.003)	-	2.200 (0.003)
Chrysene	mg/kg	760[A]	230[B]	0.850 (0.003)	5.600 (0.003)	5.100 (0.003)	0.280 (0.003)	1.000 (0.003)	2.700 (0.003)	1.800 (0.003)	1.600 (0.003)	-	8.900 (0.003)	-	5.800 (0.003)
Fluorene	mg/kg	130000[A]	3800[B]	0.070 (0.003)	1.700 (0.003)	1.400 (0.003)	0.012 J (0.003)	8.500 (0.003)	66.000 (0.003)	0.330 (0.003)	2.500 (0.003)	-	9.300 (0.003)	-	7.400 (0.003)
Naphthalene	mg/kg	760[A]	25[B]	0.630 (0.003)	2.900 (0.003)	1.900 (0.003)	0.220 (0.003)	ND (0.220) (0.003)	1.300 (0.003)	0.440 (0.003)	ND (0.200) (0.003)	-	21.000 (0.003)	-	2.800 (0.003)
Phenanthrene	mg/kg	190000[A]	10000[B]	0.720 (0.003)	10.000 (0.003)	14.000 (0.003)	0.230 (0.003)	10.000 (0.003)	20.000 (0.003)	2.000 (0.003)	0.960 (0.003)	-	24.000 (0.003)	-	16.000 (0.003)
Pyrene	mg/kg	96000[A]	2200[B]	1.200 (0.003)	10.000 (0.003)	13.000 (0.003)	0.430 (0.003)	1.900 (0.003)	1.800 (0.003)	3.300 (0.003)	0.810 (0.003)	-	12.000 (0.003)	-	8.400 (0.003)
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	***803*** [B] (0.510)	298 (0.510)	149 (0.510)	***1460*** [B] (0.510)	***734*** [B] (0.510)	141 (0.510)	194 (0.510)	32.0 (0.510)	344 (0.510)	-	***671*** [B] (0.510)	-
General Chemistry															
Moisture, Percent	%	n/v	n/v	14.7 (0.50)	13.6 (0.50)	11.5 (0.50)	19.7 (0.50)	22.8 (0.50)	20.0 (0.50)	8.2 (0.50)	14.8 (0.50)	33.7 (0.50)	34.4 (0.50)	26.7 (0.50)	19.9 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-016		AOI6-BH-16-017	AOI6-BH-16-018	AOI6-BH-16-019			AOI6-BH-16-020	AOI6-BH-16-021	AOI6-BH-16-022	AOI6-BH-16-023
Sample Date				4-Apr-16	11-Jul-16	11-Apr-16	11-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	6-Apr-16	21-Apr-16
Sample ID				AOI6-BH-16-016-0-2-SOIL	AOI6-BH-16-016-0-2-071116	AOI6-BH-16-017-0-2-SOIL	AOI6-BH-16-018-0-2-SOIL	AOI6-BH16-DUP-SOIL-001	AOI6-BH-16-019-0-2-SOIL	AOI6-BH-16-019-2-4-SOIL	AOI6-BH-16-020-0-2-SOIL	AOI6-BH-16-021-0-2-SOIL	AOI6-BH-16-022-0-2-SOIL	AOI6-BH-16-023-0-2-SOIL
Sample Depth				1 - 1.5 ft	1.5 - 2 ft	0.5 - 1 ft	0.75 - 1 ft		0.8 - 1.8 ft	1.8 - 3 ft	0 - 1.1 ft	0 - 0.5 ft	0.5 - 1 ft	1.5 - 1.9 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1647893	1682991	1649742	1649742	1653975	1653975	1653975	1653975	1653975	1648963	1653975
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8321184	8475486	8329544	8329543	8349803	8349802	8349804	8349801	8349800	8325910	8349798
Volatile Organic Compounds														
Benzene	mg/kg	290[A]	0.5[B]	0.004 J (0.0005)	-	0.001 J (0.0005)	0.071 (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0006)	0.002 J (0.0006)	0.039 J (0.030)	0.062 J (0.024)	0.089 J (0.0005)	0.130 J (0.047)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.006)* (0.001)	-	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	*ND (0.006)* (0.001)	*ND (0.006)* (0.001)	*ND (0.300)* (0.061)	*ND (0.240)* (0.048)	*ND (0.240)* (0.001)	*ND (0.470)* (0.094)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.006) (0.001)	-	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	ND (0.240) (0.048)	ND (0.240) (0.001)	ND (0.470) (0.094)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.006) (0.001)	-	ND (0.004) (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	ND (0.240) (0.048)	0.052 J (0.001)	0.100 J (0.094)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.006) (0.001)	-	ND (0.004) (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	0.002 J (0.001)	0.420 (0.061)	ND (0.240) (0.048)	ND (0.240) (0.001)	0.340 J (0.094)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.006) (0.0005)	-	ND (0.004) (0.0005)	ND (0.004) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0006)	ND (0.006) (0.0006)	ND (0.300) (0.030)	ND (0.240) (0.024)	ND (0.240) (0.0005)	ND (0.470) (0.047)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.003 J (0.001)	-	ND (0.004) (0.001)	0.005 (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	0.002 J (0.001)	ND (0.300) (0.061)	0.100 J (0.048)	0.150 J (0.001)	0.200 J (0.094)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	ND (0.006) (0.001)	-	ND (0.004) (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	0.110 J (0.048)	ND (0.240) (0.001)	0.120 J (0.094)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.006) (0.001)	-	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	0.082 J (0.048)	ND (0.240) (0.001)	ND (0.470) (0.094)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.006) (0.001)	-	ND (0.004) (0.001)	0.002 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	0.072 J (0.061)	0.100 J (0.048)	0.180 J (0.001)	0.210 J (0.094)
Semi-Volatile Organic Compounds														
Anthracene	mg/kg	190000[A]	350[B]	-	1.900 (0.003)	0.350 (0.003)	0.670 (0.003)	1.400 (0.008)	1.400 (0.009)	0.390 (0.009)	3.700 (0.019)	1.000 (0.007)	2.100 (0.003)	2.100 (0.010)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	1.700 (0.003)	3.300 (0.003)	1.400 (0.003)	1.300 (0.008)	1.200 (0.009)	1.400 (0.009)	7.400 (0.019)	2.400 (0.007)	3.400 (0.003)	1.300 (0.010)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	1.700 (0.003)	4.200 (0.003)	1.900 (0.003)	1.400 (0.008)	1.300 (0.009)	1.400 (0.009)	7.800 (0.019)	2.200 (0.007)	4.100 (0.003)	1.700 (0.010)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	2.300 (0.003)	6.700 (0.003)	2.300 (0.003)	1.700 (0.008)	1.500 (0.009)	1.700 (0.009)	9.800 (0.019)	3.000 (0.007)	5.300 (0.003)	1.800 (0.010)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	1.600 (0.003)	4.800 (0.003)	1.500 (0.003)	1.500 (0.008)	1.400 (0.009)	0.880 (0.009)	5.100 (0.019)	1.400 (0.007)	3.300 (0.003)	1.800 (0.010)
Chrysene	mg/kg	760[A]	230[B]	-	2.000 (0.003)	4.900 (0.003)	1.900 (0.003)	1.400 (0.008)	1.300 (0.009)	1.400 (0.009)	7.700 (0.019)	2.300 (0.007)	4.900 (0.003)	1.500 (0.010)
Fluorene	mg/kg	130000[A]	3800[B]	-	5.100 (0.003)	0.081 (0.003)	0.480 (0.003)	0.610 (0.008)	0.590 (0.009)	0.200 (0.009)	2.200 (0.019)	0.530 (0.007)	1.600 (0.003)	1.900 (0.010)
Naphthalene	mg/kg	760[A]	25[B]	-	9.300 (0.003)	0.120 (0.003)	2.100 (0.003)	8.300 (0.008)	7.700 (0.009)	1.500 (0.009)	3.300 (0.019)	1.100 (0.007)	3.500 (0.003)	12.000 (0.010)
Phenanthrene	mg/kg	190000[A]	10000[B]	-	9.600 (0.003)	2.400 (0.003)	1.600 (0.003)	3.200 (0.008)	3.300 (0.009)	1.100 (0.009)	13.000 (0.019)	3.200 (0.007)	5.400 (0.003)	4.800 (0.010)
Pyrene	mg/kg	96000[A]	2200[B]	-	2.400 (0.003)	8.100 (0.003)	2.400 (0.003)	1.600 (0.008)	1.600 (0.009)	1.400 (0.009)	13.000 (0.019)	3.900 (0.007)	7.900 (0.003)	2.400 (0.010)
Metals														
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	313 (0.510)	-	180 (0.510)	138 (0.510)	***6690*** [AB] (2.34)	***2920*** [AB] (2.34)	***1370*** [B] (2.81)	199 (0.503)	223 (2.43)	236 (0.510)	393 (0.593)
General Chemistry														
Moisture, Percent	%	n/v	n/v	12.5 (0.50)	29.2 (0.50)	9.4 (0.50)	8.6 (0.50)	20.3 (0.50)	22.8 (0.50)	24.9 (0.50)	12.6 (0.50)	9.6 (0.50)	12.5 (0.50)	34.9 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-025			AOI6-BH-16-026	AOI6-BH-16-027	AOI6-BH-16-028	AOI6-BH-16-029	AOI6-BH-16-030	AOI6-BH-16-031	AOI6-BH-16-032	AOI6-BH-16-033	AOI6-BH-16-034
Sample Date				22-Apr-16	22-Apr-16	22-Apr-16	22-Apr-16	13-Apr-16	13-Apr-16	13-Apr-16	14-Apr-16	14-Apr-16	13-Apr-16	13-Apr-16	13-Apr-16
Sample ID				AOI6-BH16-DUP-04-22-16-003	AOI6-BH-16-025-0-2-SOIL	AOI6-BH-16-025-2-4-SOIL	AOI6-BH-16-026-0-2-SOIL	AOI6-BH-16-027-0-2-SOIL	AOI6-BH-16-028-0-2-SOIL	AOI6-BH-16-029-0-2-SOIL	AOI6-BH-16-030-0-2-SOIL	AOI6-BH-16-031-0-2-SOIL	AOI6-BH-16-032-0-2-SOIL	AOI6-BH-16-033-0-2-SOIL	AOI6-BH-16-034-0-2-SOIL
Sample Depth					1.5 - 1.9 ft	1.9 - 2.2 ft	0.4 - 1.3 ft	1.75 - 2 ft	0.25 - 0.5 ft	1.75 - 2 ft	1.5 - 2 ft	1 - 2 ft	1 - 2 ft	1.5 - 2 ft	1.5 - 1.75 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1653975	1653975	1653975	1653975	1651423	1651423	1651423	1651423	1651423	1651423	1651423	1651423
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8349812	8349810	8349811	8349813	8336830	8336829	8336827	8336847	8336849	8336838	8336836	8336834
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	***2.600*** [B] (0.021)	***2.700*** [B] (0.022)	***1400.000 J*** [AB] (2.400)	***7.600*** [B] (0.022)	ND (0.005) (0.0005)	0.460 (0.0005)	***0.990*** [B] (0.0005)	***9.400*** [B] (0.0005)	***0.630*** [B] (0.0005)	0.120 J (0.0005)	0.003 J (0.0005)	***44.000*** [B] (0.0005)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.210)* (0.043)	*ND (0.220)* (0.045)	*ND (24.000)* (4.800)	*ND (0.220)* (0.044)	ND (0.005) (0.001)	*ND (0.260)* (0.001)	*ND (0.250)* (0.001)	*ND (4.400)* (0.001)	*ND (0.220)* (0.001)	*ND (0.220)* (0.001)	ND (0.004) (0.001)	*ND (5.000)* (0.001)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.210) (0.043)	ND (0.220) (0.045)	*ND (24.000)* (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	ND (0.260) (0.001)	ND (0.250) (0.001)	*ND (4.400)* (0.001)	ND (0.220) (0.001)	ND (0.220) (0.001)	ND (0.004) (0.001)	*ND (5.000)* (0.001)
Ethylbenzene	mg/kg	890[A]	70[B]	0.110 J (0.043)	0.120 J (0.045)	61.000 J (4.800)	0.082 J (0.044)	ND (0.005) (0.001)	0.100 J (0.001)	0.300 (0.001)	ND (4.400) (0.001)	0.053 J (0.001)	0.051 J (0.001)	ND (0.004) (0.001)	ND (5.000) (0.001)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	2.600 (0.043)	2.900 (0.045)	2200.000 J (48.000)	1.800 (0.044)	ND (0.005) (0.001)	0.220 J (0.001)	1.700 (0.001)	18.000 (0.001)	4.000 (0.001)	1.700 (0.001)	0.019 (0.001)	230.000 (0.001)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.210) (0.021)	ND (0.220) (0.022)	*ND (24.000)* (2.400)	ND (0.220) (0.022)	ND (0.005) (0.0005)	ND (0.260) (0.0005)	ND (0.250) (0.0005)	*ND (4.400)* (0.0005)	ND (0.220) (0.0005)	ND (0.220) (0.0005)	ND (0.004) (0.0005)	*ND (5.000)* (0.0005)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.750 (0.043)	0.900 (0.045)	***640.000 J*** [B] (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	0.450 (0.001)	0.370 (0.001)	ND (4.400) (0.001)	ND (0.220) (0.001)	0.091 J (0.001)	ND (0.004) (0.001)	38.000 (0.001)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	0.096 J (0.043)	0.095 J (0.045)	***50.000 J*** [B] (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	0.057 J (0.001)	0.250 J (0.001)	ND (4.400) (0.001)	ND (0.220) (0.001)	ND (0.220) (0.001)	ND (0.004) (0.001)	ND (5.000) (0.001)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.210) (0.043)	0.045 J (0.045)	18.000 J (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	ND (0.260) (0.001)	0.095 J (0.001)	ND (4.400) (0.001)	ND (0.220) (0.001)	ND (0.220) (0.001)	ND (0.004) (0.001)	ND (5.000) (0.001)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	0.480 (0.043)	0.530 (0.045)	340.000 J (4.800)	0.092 J (0.044)	ND (0.005) (0.001)	0.340 (0.001)	0.600 (0.001)	ND (4.400) (0.001)	0.083 J (0.001)	0.130 J (0.001)	ND (0.004) (0.001)	2.100 J (0.001)
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	4.900 (0.018)	4.400 (0.018)	1.200 (0.004)	0.710 (0.015)	0.007 J (0.003)	0.390 (0.003)	2.900 (0.003)	0.037 J (0.003)	ND (0.019) (0.003)	0.008 J (0.003)	0.030 J (0.003)	0.027 (0.003)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	3.800 (0.018)	3.200 (0.018)	1.100 (0.004)	1.300 (0.015)	0.011 J (0.003)	0.910 (0.003)	6.100 (0.003)	0.094 J (0.003)	0.004 J (0.003)	0.032 (0.003)	0.120 (0.003)	0.090 (0.003)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	2.700 (0.018)	2.300 (0.018)	0.690 (0.004)	1.300 (0.015)	0.010 J (0.003)	1.200 (0.003)	6.200 (0.003)	0.120 (0.003)	0.006 J (0.003)	0.036 (0.003)	0.130 (0.003)	0.092 (0.003)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	3.200 (0.018)	2.800 (0.018)	1.000 (0.004)	0.890 (0.015)	0.016 J (0.003)	1.600 (0.003)	8.700 (0.003)	0.180 (0.003)	0.007 J (0.003)	0.049 (0.003)	0.180 (0.003)	0.130 (0.003)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	1.000 (0.018)	0.930 (0.018)	0.330 (0.004)	0.720 (0.015)	0.009 J (0.003)	1.100 (0.003)	4.500 (0.003)	0.130 (0.003)	0.005 J (0.003)	0.032 (0.003)	0.130 (0.003)	0.083 (0.003)
Chrysene	mg/kg	760[A]	230[B]	3.200 (0.018)	2.800 (0.018)	0.970 (0.004)	2.200 (0.015)	0.021 J (0.003)	1.000 (0.003)	6.100 (0.003)	0.098 (0.003)	0.005 J (0.003)	0.038 (0.003)	0.140 (0.003)	0.110 (0.003)
Fluorene	mg/kg	130000[A]	3800[B]	4.400 (0.018)	4.200 (0.018)	0.850 (0.004)	0.510 (0.015)	0.009 J (0.003)	0.160 (0.003)	3.200 (0.003)	ND (0.095) (0.003)	ND (0.019) (0.003)	ND (0.018) (0.003)	ND (0.092) (0.003)	0.017 J (0.003)
Naphthalene	mg/kg	760[A]	25[B]	0.480 (0.018)	0.460 (0.018)	2.000 (0.004)	1.100 (0.015)	0.010 J (0.003)	1.200 (0.003)	3.100 (0.003)	0.024 J (0.003)	ND (0.019) (0.003)	ND (0.018) (0.003)	ND (0.092) (0.003)	0.070 (0.003)
Phenanthrene	mg/kg	190000[A]	10000[B]	14.000 (0.018)	13.000 (0.018)	4.100 (0.004)	1.900 (0.015)	0.02 J (0.003)	1.100 (0.003)	11.000 (0.003)	0.054 J (0.003)	0.004 J (0.003)	0.025 (0.003)	0.058 J (0.003)	0.087 (0.003)
Pyrene	mg/kg	96000[A]	2200[B]	6.600 (0.018)	5.600 (0.018)	2.100 (0.004)	2.100 (0.015)	0.032 (0.003)	1.200 (0.003)	11.000 (0.003)	0.130 (0.003)	0.007 J (0.003)	0.057 (0.003)	0.190 (0.003)	0.160 (0.003)
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	10.2 (0.480)	10.3 (0.465)	64.3 (0.382)	61.8 (0.405)	20.0 (0.510)	159 (0.510)	138 (0.510)	66.0 (0.510)	5.63 (0.510)	10.3 (0.510)	12.8 (0.510)	14.0 (0.510)
General Chemistry															
Moisture, Percent	%	n/v	n/v	9.1 (0.50)	8.7 (0.50)	9.1 (0.50)	8.8 (0.50)	24.8 (0.50)	8.7 (0.50)	12.0 (0.50)	11.4 (0.50)	10.4 (0.50)	8.1 (0.50)	8.4 (0.50)	13.2 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-035	AOI6-BH-16-036	AOI6-BH-16-037		AOI6-BH-16-038	AOI6-BH-16-039	AOI6-BH-16-040		AOI6-BH-16-041		AOI6-BH-16-043
Sample Date				13-Apr-16	14-Apr-16	14-Apr-16	14-Apr-16	14-Apr-16	11-Apr-16	7-Apr-16	7-Apr-16	7-Apr-16	7-Apr-16	7-Apr-16
Sample ID				AOI6-BH-16-035-0-2-SOIL	AOI6-BH-16-036-0-2-SOIL	AOI6-BH-16-037-0-2-SOIL	AOI6-BH-16-037-2-4-SOIL	AOI6-BH-16-038-0-2-SOIL	AOI6-BH-16-039-0-2-SOIL	AOI6-BH-16-040-0-2-SOIL	AOI6-BH-16-040-2-4-SOIL	AOI6-BH-16-041-0-2-SOIL	AOI6-BH-16-041-2-4-SOIL	AOI6-BH-16-43-0-2-SOIL
Sample Depth				1.5 - 2 ft	1.25 - 1.75 ft	1 - 1.75 ft	1.75 - 2.25 ft	1.5 - 1.75 ft	0.5 - 0.6 ft	0.5 - 0.75 ft	1.75 - 2 ft	0.75 - 1.25 ft	1.75 - 2.25 ft	0.5 - 1 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1651423	1651423	1651423	1651423	1651423	1649742	1648963	1648963	1648963	1648963	1648963
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8336832	8336841	8336843	8336844	8336845	8329547	8325909	8325914	8325916	8325912	8325911
Volatile Organic Compounds														
Benzene	mg/kg	290[A]	0.5[B]	0.001 J (0.0005)	***0.550 J[B]*** (0.0005)	***710.000[AB]*** (0.0005)	***850.000[AB]*** (0.0005)	***8.800[B]*** (0.0005)	ND (0.005) (0.0005)	***1.100 J[B]*** (0.0005)	***1.400 J[B]*** (0.0005)	-	***4.300[B]*** (0.0005)	***0.810[B]*** (0.0005)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.004) (0.001)	*ND (4.500)* (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	*ND (4.800)* (0.001)	ND (0.005) (0.001)	*ND (1.100)* (0.001)	*ND (4.900)* (0.001)	-	*ND (3.200)* (0.001)	*ND (0.220)* (0.001)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.004) (0.001)	*ND (4.500)* (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	*ND (4.800)* (0.001)	ND (0.005) (0.001)	*ND (1.100)* (0.001)	*ND (4.900)* (0.001)	-	*ND (3.200)* (0.001)	ND (0.220) (0.001)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.004) (0.001)	ND (4.500) (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.760 J (0.001)	13.000 (0.001)	-	17.000 (0.001)	0.064 J (0.001)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	0.021 (0.001)	59.000 (0.001)	***6500.000[B]*** (0.001)	***8500.000[B]*** (0.001)	14.000 (0.001)	ND (0.005) (0.001)	1.200 (0.001)	6.400 (0.001)	-	6.400 (0.001)	0.055 J (0.001)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.004) (0.0005)	*ND (4.500)* (0.0005)	*ND (94.000)* (0.0005)	*ND (97.000)* (0.0005)	*ND (4.800)* (0.0005)	ND (0.005) (0.0005)	ND (1.100) (0.0005)	*ND (4.900)* (0.0005)	-	*ND (3.200)* (0.0005)	ND (0.220) (0.0005)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	ND (0.004) (0.001)	ND (4.500) (0.001)	***840.000[B]*** (0.001)	***1200.000[B]*** (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	ND (1.100) (0.001)	ND (4.900) (0.001)	-	2.500 J (0.001)	0.190 J (0.001)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	ND (0.004) (0.001)	ND (4.500) (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.330 J (0.001)	8.100 (0.001)	-	***47.000[B]*** (0.001)	0.045 J (0.001)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.004) (0.001)	ND (4.500) (0.001)	ND (94.000) (0.001)	ND (97.000) (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.380 J (0.001)	5.800 (0.001)	-	22.000 (0.001)	0.046 J (0.001)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.004) (0.001)	ND (4.500) (0.001)	26.000 J (0.001)	27.000 J (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.880 J (0.001)	2.700 J (0.001)	-	39.000 (0.001)	0.330 (0.001)
Semi-Volatile Organic Compounds														
Anthracene	mg/kg	190000[A]	350[B]	ND (0.019) (0.003)	0.064 J (0.003)	0.068 J (0.003)	0.110 (0.003)	0.073 J (0.003)	0.005 J (0.003)	1.700 (0.003)	5.900 (0.003)	6.200 (0.003)	2.700 (0.003)	0.260 (0.003)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	0.008 J (0.003)	0.350 (0.003)	0.110 (0.003)	0.050 (0.003)	0.190 (0.003)	0.019 J (0.003)	3.100 (0.003)	5.000 (0.003)	12.000 (0.003)	5.800 (0.003)	0.710 (0.003)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	0.009 J (0.003)	0.300 (0.003)	0.160 (0.003)	0.074 (0.003)	0.220 (0.003)	0.019 J (0.003)	2.200 (0.003)	4.900 (0.003)	8.000 (0.003)	5.300 (0.003)	1.100 (0.003)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	0.014 J (0.003)	0.570 (0.003)	0.240 (0.003)	0.110 (0.003)	0.330 (0.003)	0.033 (0.003)	3.200 (0.003)	6.300 (0.003)	14.000 (0.003)	7.800 (0.003)	1.500 (0.003)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.010 J (0.003)	0.270 (0.003)	0.190 (0.003)	0.070 (0.003)	0.200 (0.003)	0.015 J (0.003)	1.200 (0.003)	3.100 (0.003)	5.100 (0.003)	3.900 (0.003)	1.300 (0.003)
Chrysene	mg/kg	760[A]	230[B]	0.010 J (0.003)	0.410 (0.003)	0.140 (0.003)	0.053 (0.003)	0.220 (0.003)	0.025 (0.003)	2.900 (0.003)	5.100 (0.003)	12.000 (0.003)	5.600 (0.003)	0.780 (0.003)
Fluorene	mg/kg	130000[A]	3800[B]	ND (0.019) (0.003)	0.035 J (0.003)	0.049 J (0.003)	0.033 (0.003)	0.036 J (0.003)	ND (0.023) (0.003)	1.600 (0.003)	6.400 (0.003)	6.800 (0.003)	2.800 (0.003)	0.050 J (0.003)
Naphthalene	mg/kg	760[A]	25[B]	ND (0.019) (0.003)	0.099 (0.003)	1.300 (0.003)	1.400 (0.003)	0.093 J (0.003)	0.006 J (0.003)	3.200 (0.003)	***36.000[B]*** (0.003)	22.000 (0.003)	12.000 (0.003)	0.270 (0.003)
Phenanthrene	mg/kg	190000[A]	10000[B]	0.010 J (0.003)	0.260 (0.003)	0.180 (0.003)	3.200 (0.003)	0.180 (0.003)	0.016 J (0.003)	6.700 (0.003)	21.000 (0.003)	25.000 (0.003)	13.000 (0.003)	0.420 (0.003)
Pyrene	mg/kg	96000[A]	2200[B]	0.015 J (0.003)	0.510 (0.003)	0.220 (0.003)	0.084 (0.003)	0.280 (0.003)	0.033 (0.003)	6.400 (0.003)	9.700 (0.003)	21.000 (0.003)	11.000 (0.003)	0.860 (0.003)
Metals														
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	10.0 (0.510)	60.8 (0.510)	100 (0.510)	105 (0.510)	33.1 (0.510)	7.22 (0.510)	249 (0.510)	142 (0.510)	***3820[AB]*** (0.510)	196 (0.510)	331 (0.510)
General Chemistry														
Moisture, Percent	%	n/v	n/v	10.7 (0.50)	10.5 (0.50)	15.1 (0.50)	14.4 (0.50)	10.1 (0.50)	24.7 (0.50)	10.6 (0.50)	8.4 (0.50)	16.5 (0.50)	17.9 (0.50)	8.0 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	8.15 (0.0100)	8.09 (0.0100)	7.89 (0.0100)	7.86 (0.0100)	9.15 (0.0100)
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential
	Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AST-250-SS-1		AST-250-SS-2		AST-250-SS-3		AST-250-SS-4		AST-250-SS-5		AST-250-SS-6	
Sample Date				15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07
Sample ID				AST-250-SS-1	AST-250-SS-1	AST-250-SS-2	AST-250-SS-2	AST-250-SS-3	AST-250-SS-3	AST-250-SS-4	AST-250-SS-4	AST-250-SS-5	AST-250-SS-5	AST-250-SS-6	AST-250-SS-6
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP
Laboratory Work Order		A	B	073770	075326	073770	075326	073770	075326	073770	075326	073770	075326	073770	075326
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-2798	0707-0961	0705-2799	0707-0962	0705-2800	0707-0963	0705-2802	0707-0964	0705-2801	0707-0965	0705-2803	0707-0966
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-	ND (0.110) D ()	-	ND (0.069) D ()	-
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.081) D* ()	-	*ND (0.097) D* ()	-	*ND (0.088) D* ()	-	*ND (0.100) D* ()	-	*ND (0.110) D* ()	-	*ND (0.069) D* ()	-
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-	ND (0.110) D ()	-	ND (0.069) D ()	-
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-	ND (0.110) D ()	-	ND (0.069) D ()	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	0.120 D ()	-	ND (0.110) D ()	-	ND (0.069) D ()	-
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	0.052 J D ()	-	0.067 J D ()	-	0.310 D ()	-	4.2 D ()	-	0.081 J D ()	-	0.065 J D ()	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-	ND (0.110) D ()	-	ND (0.069) D ()	-
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.081) D ()	-	ND (0.097) D ()	-	0.098 D ()	-	0.870 D ()	-	ND (0.110) D ()	-	ND (0.069) D ()	-
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	760[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	130000[A]	3800[B]	ND (0.350) ()	ND (0.350) ()	ND (0.350) ()	ND (0.350) ()	ND (0.370) ()	ND (0.350) ()	ND (0.350) ()	0.620 ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()	ND (0.380) ()
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	96000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	-	***940[B]*** ()	-	30 ()	-	100 ()	-	2.8 ()	-	190 ()	-	***1500[B]*** ()
General Chemistry															
Moisture, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc. Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				**AST-250-SS-7**		**AST-250-SS-8**		**B-148**	**B-149**	**B-150**	**B-151**	**B-152**	**B-153**	**B-154**
Sample Date				**15-May-07**	**15-May-07**	**15-May-07**	**15-May-07**	**17-Sep-02**	**17-Sep-02**	**16-Sep-02**	**1-Mar-06**	**1-Mar-06**	**1-Mar-06**	**1-Mar-06**
Sample ID				**AST-250-SS-7**	**AST-250-SS-7**	**AST-250-SS-8**	**AST-250-SS-8**	**MW-1(1-1.5)**	**MW-2(1-1.5)**	**MW-3(1-1.5)**	**BH-B151-030106-0.5-1**	**BH-B152-030106-1.5-2**	**BH-B153-030106-1.5-2**	**BH-B154-030106-1-1.5**
Sample Depth				**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**1 - 1.5 ft**	**1 - 1.5 ft**	**1 - 1.5 ft**	**0.5 - 1 ft**	**1.5 - 2 ft**	**1.5 - 2 ft**	**1 - 1.5 ft**
Sampling Company				**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**
Laboratory				**PIP**	**PIP**	**PIP**	**PIP**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**
Laboratory Work Order		**A**	**B**	**073770**	**075326**	**073770**	**075326**	**823334**	**823334**	**823334**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**
Laboratory Sample ID	**Units**	**MSC-PA**	**SHS-PA**	**0705-2804**	**0707-0967**	**0705-2805**	**0707-0968**	**3901264**	**3901265**	**3901266**	**4720664**	**4720663**	**4720662**	**4720665**
Volatile Organic Compounds														
Benzene	mg/kg	290[A]	0.5[B]	ND (0.078) D ()	-	ND (0.092) D ()	-	***2.6***[B] (0.001)	***6.5***[B] (0.001)	***610***[AB] (0.001)	ND (0.200) (0.018)	0.460 (0.017)	ND (0.420) (0.025)	***3.6***[B] (0.013)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.078) D* ()	-	*ND (0.092) D* ()	-	-	-	-	*ND (0.200)* (0.036)	*ND (0.200)* (0.033)	*ND (0.420)* (0.05)	*ND (0.160)* (0.027)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.078) D ()	-	ND (0.092) D ()	-	-	-	-	ND (0.200) (0.036)	ND (0.200) (0.033)	ND (0.420) (0.05)	ND (0.160) (0.027)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.078) D ()	-	ND (0.092) D ()	-	3.7 (0.001)	0.520 (0.001)	14 (0.001)	ND (0.200) (0.036)	0.240 (0.033)	ND (0.420) (0.05)	1.8 (0.027)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.078) D ()	-	ND (0.092) D ()	-	60 (0.001)	190 (0.001)	270 (0.001)	ND (0.200) (0.036)	20 (0.33)	ND (0.420) (0.05)	1.8 (0.027)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	-	-	-	-	ND (0.310) (0.001)	ND (0.330) (0.001)	ND (1.1) (0.001)	ND (0.200) (0.018)	ND (0.200) (0.017)	ND (0.420) (0.025)	ND (0.160) (0.013)
Naphthalene	mg/kg	760[A]	25[B]	0.055 J D ()	-	0.075 J D ()	-	1.8 (0.001)	1.9 (0.001)	4.8 (0.001)	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	ND (0.078) D ()	-	ND (0.092) D ()	-	1.6 (0.001)	ND (0.330) (0.001)	***300***[B] (0.001)	ND (0.200) (0.036)	ND (0.200) (0.033)	ND (0.420) (0.05)	0.240 (0.027)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.078) D ()	-	ND (0.092) D ()	-	3.5 (0.001)	0.860 (0.001)	67 (0.001)	ND (0.200) (0.036)	ND (0.200) (0.033)	ND (0.420) (0.05)	1.2 (0.027)
Semi-Volatile Organic Compounds														
Anthracene	mg/kg	190000[A]	350[B]	-	-	-	-	-	-	-	ND (0.920) (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	6.2 (1)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	-	-	-	-	-	-	2.0 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	5.9 (1)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	-	-	-	-	-	-	1.7 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	ND (5.8) (1)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	-	-	-	-	-	-	1.6 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	ND (5.8) (1)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	-	-	-	-	-	-	ND (0.920) (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	ND (5.8) (1)
Chrysene	mg/kg	760[A]	230[B]	-	-	-	-	-	-	-	2.4 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	7.8 (1)
Fluorene	mg/kg	130000[A]	3800[B]	ND (0.350) ()	ND (0.390) ()	ND (0.360) ()	ND (0.350) ()	-	-	-	1.1 (0.17)	ND (3.0) (0.5)	4.2 (0.033)	7.8 (1)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	8.6 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	6.8 (1)
Phenanthrene	mg/kg	190000[A]	10000[B]	-	-	-	-	-	-	-	2.9 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	31 (1)
Pyrene	mg/kg	96000[A]	2200[B]	-	-	-	-	-	-	-	5.3 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	15 (1)
Metals														
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	-	140 ()	-	13 ()	-	-	-	198 (3.75)	27 (0.765)	66.3 (0.78)	410 (0.772)
General Chemistry														
Moisture, Percent	%	n/v	n/v	-	-	-	-	22.7 (0.50)	27.4 (0.50)	14.2 (0.50)	9.4 (0.5)	15.6 (0.5)	40.8 (0.5)	13.5 (0.5)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential
	Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B-155	B-156	B-157	B-160	B-161	B-162	B-164	B-166	B-167	B-170	B-171
Sample Date				20-Mar-06	20-Mar-06	1-Mar-06	1-Mar-06	1-Mar-06	1-Mar-06	1-Mar-06	13-Dec-12	13-Dec-12	13-Dec-12	6-Apr-16
Sample ID				BH-B155-032006-1.5-2	BH-B156-032006-1-1.5	BH-B157-030106-1-1.5	BH-B160-030106-1-1.5	BH-B161-030106-1.5-2	BH-B162-030106-1-1.5	BH-B164-030106-1.5-2	B-166_2'	B-167_2'	B-170_2'	AOI6-B-171-0-2-SOIL
Sample Depth				1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL
Laboratory Work Order		A	B	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	JB23816	JB23816	JB23816	1648963
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4734388	4734387	4720661	4720658	4720659	4720657	4720660	JB23816-3	JB23816-1	JB23816-5	8325908
Volatile Organic Compounds														
Benzene	mg/kg	290[A]	0.5[B]	ND (0.220) (0.016)	0.009 (0.0004)	ND (0.240) (0.019)	ND (0.005) (0.0004)	ND (0.440) (0.034)	ND (0.005) (0.0005)	ND (0.370) (0.03)	ND (0.0015) (0.00018)	0.0638 (0.0058)	ND (0.0010) (0.00012)	0.001 J (0.0005)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.220)* (0.032)	ND (0.005) (0.0007)	*ND (0.240)* (0.038)	ND (0.005) (0.0007)	*ND (0.440)* (0.069)	ND (0.005) (0.001)	*ND (0.370)* (0.06)	ND (0.0015) (0.00019)	*ND (0.048)* (0.0061)	ND (0.0010) (0.00013)	ND (0.004) (0.001)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.220) (0.032)	ND (0.005) (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	ND (0.440) (0.069)	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00020)	ND (0.048) (0.0065)	ND (0.0010) (0.00014)	ND (0.004) (0.001)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.220) (0.032)	ND (0.005) (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	ND (0.440) (0.069)	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00039)	0.395 (0.013)	ND (0.0010) (0.00027)	ND (0.004) (0.001)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.220) (0.032)	0.007 (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	2.2 (0.069)	ND (0.005) (0.001)	2.2 (0.06)	ND (0.0074) (0.00011)	3.15 (0.0036)	0.0030 J (0.000077)	ND (0.004) (0.001)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.220) (0.016)	ND (0.005) (0.0004)	ND (0.240) (0.019)	ND (0.005) (0.0004)	ND (0.440) (0.034)	ND (0.005) (0.0005)	ND (0.370) (0.03)	ND (0.0015) (0.00035)	ND (0.048) (0.011)	0.00054 J (0.00024)	ND (0.004) (0.0005)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	ND (0.220) (0.032)	0.006 (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	ND (0.440) (0.069)	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00016)	0.0932 (0.0051)	0.00040 J (0.00011)	ND (0.004) (0.001)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	ND (0.0074) (0.00031)	0.229 J (0.010)	ND (0.0052) (0.00022)	ND (0.004) (0.001)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	ND (0.0074) (0.00024)	0.101 J (0.0077)	ND (0.0052) (0.00017)	ND (0.004) (0.001)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.220) (0.032)	0.007 (0.0007)	0.270 (0.038)	ND (0.005) (0.0007)	5.1 (0.069)	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00021)	0.806 (0.0067)	ND (0.0010) (0.00014)	ND (0.004) (0.001)
Semi-Volatile Organic Compounds														
Anthracene	mg/kg	190000[A]	350[B]	0.750 (0.033)	0.860 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	0.360 (0.033)	ND (0.180) (0.033)	ND (0.200) (0.033)	0.0812 (0.015)	0.0325 J (0.012)	0.257 (0.013)	0.120 (0.003)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	0.840 (0.033)	0.830 (0.033)	1.4 (0.17)	ND (0.220) (0.033)	1.8 (0.033)	0.200 (0.033)	0.350 (0.033)	0.318 (0.014)	0.113 (0.011)	0.578 (0.012)	0.440 (0.003)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	0.780 (0.033)	0.820 (0.033)	1.5 (0.17)	ND (0.220) (0.033)	2.2 (0.033)	0.220 (0.033)	0.410 (0.033)	0.330 (0.013)	0.130 (0.010)	0.659 (0.011)	0.450 (0.003)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	1.1 (0.033)	1.1 (0.033)	2.1 (0.17)	ND (0.220) (0.033)	2.7 (0.033)	0.290 (0.033)	0.680 (0.033)	0.293 (0.014)	0.150 (0.011)	0.617 (0.012)	0.540 (0.003)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.310 (0.033)	0.420 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	1.3 (0.033)	ND (0.180) (0.033)	0.270 (0.033)	0.228 (0.016)	0.121 (0.013)	0.466 (0.014)	0.290 (0.003)
Chrysene	mg/kg	760[A]	230[B]	0.820 (0.033)	0.920 (0.033)	1.4 (0.17)	ND (0.220) (0.033)	2.1 (0.033)	0.250 (0.033)	0.360 (0.033)	0.334 (0.014)	0.137 (0.011)	0.589 (0.012)	0.420 (0.003)
Fluorene	mg/kg	130000[A]	3800[B]	1.1 (0.033)	1.9 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	ND (0.210) (0.033)	ND (0.180) (0.033)	ND (0.200) (0.033)	0.0259 J (0.014)	0.0176 J (0.011)	0.229 (0.012)	0.044 J (0.003)
Naphthalene	mg/kg	760[A]	25[B]	0.700 (0.033)	0.370 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	0.340 (0.033)	ND (0.180) (0.033)	ND (0.200) (0.033)	0.0370 J (0.011)	0.0352 (0.0092)	0.114 (0.010)	0.230 (0.003)
Phenanthrene	mg/kg	190000[A]	10000[B]	3.0 (0.033)	4.3 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	0.410 (0.033)	ND (0.180) (0.033)	0.400 (0.033)	0.285 (0.019)	0.108 (0.015)	0.379 (0.017)	0.220 (0.003)
Pyrene	mg/kg	96000[A]	2200[B]	2.3 (0.033)	2.5 (0.033)	1.4 (0.17)	ND (0.220) (0.033)	2.1 (0.033)	0.320 (0.033)	0.500 (0.033)	0.536 (0.016)	0.275 (0.013)	1.16 (0.014)	0.500 (0.003)
Metals														
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	***618*** [B] (0.765)	***1070*** [B] (0.78)	178 (0.78)	30.8 (0.765)	70.1 (0.757)	***584*** [B] (0.757)	18.5 (0.772)	***744*** [B] (0.15)	253 (0.12)	66.9 (0.13)	45.7 (0.510)
General Chemistry														
Moisture, Percent	%	n/v	n/v	27.3 (0.5)	22 (0.5)	21.7 (0.5)	22.9 (0.5)	21.6 (0.5)	6.9 (0.5)	17.9 (0.5)	-	-	-	6.2 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	75.0 ()	88.8 ()	83.1 ()	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B-172		B-173		B-174		B-175		BH-02-06	
Sample Date				6-Apr-16	12-Jul-16	5-Apr-16	12-Jul-16	4-Apr-16	13-Jul-16	5-Apr-16	13-Jul-16	22-Mar-06	22-Mar-06
Sample ID				AOI6-B-172-0-2-SOIL	AOI6-B-172-0-2-071216	AOI6-B-173-0-2-SOIL	AOI6-B-173-0-2-071216	AOI6-B-174-0-2-SOIL	AOI6-B-174-0-2-071316	AOI6-B-175-0-2-SOIL	AOI6-B-175-0-2-071316	BH-02-06-032206-1.5-2	BH-02-06-032206-1.5-2
Sample Depth				0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1647893	1682991	1647893	1682991	1647893	1682991	1647893	1682991	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8321194	8475492	8321186	8475494	8321182	8475496	8321188	8475498	4736395	4739181
Volatile Organic Compounds													
Benzene	mg/kg	290[A]	0.5[B]	0.210 J (0.0005)	-	0.300 J (0.0005)	-	ND (0.004) (0.0005)	-	***1.100*** [B] (0.0005)	-	-	-
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.380)* (0.001)	-	*ND (0.310)* (0.001)	-	ND (0.004) (0.001)	-	*ND (0.320)* (0.001)	-	-	-
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.380) (0.001)	-	ND (0.310) (0.001)	-	ND (0.004) (0.001)	-	ND (0.320) (0.001)	-	-	-
Ethylbenzene	mg/kg	890[A]	70[B]	0.100 J (0.001)	-	ND (0.310) (0.001)	-	ND (0.004) (0.001)	-	0.350 (0.001)	-	-	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.380) (0.001)	-	0.360 (0.001)	-	ND (0.004) (0.001)	-	0.270 J (0.001)	-	-	-
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.380) (0.0005)	-	ND (0.310) (0.0005)	-	ND (0.004) (0.0005)	-	ND (0.320) (0.0005)	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.580 (0.001)	-	0.130 J (0.001)	-	ND (0.004) (0.001)	-	1.300 (0.001)	-	-	-
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	0.110 J (0.001)	-	0.310 (0.001)	-	ND (0.004) (0.001)	-	0.290 J (0.001)	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.380) (0.001)	-	0.130 J (0.001)	-	ND (0.004) (0.001)	-	0.260 J (0.001)	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	0.510 (0.001)	-	0.660 (0.001)	-	ND (0.004) (0.001)	-	1.600 (0.001)	-	-	-
Semi-Volatile Organic Compounds													
Anthracene	mg/kg	190000[A]	350[B]	-	0.800 (0.003)	-	0.089 J (0.003)	-	0.110 J (0.003)	-	2.400 (0.003)	-	-
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	2.400 (0.003)	-	0.300 (0.003)	-	0.600 (0.003)	-	1.900 (0.003)	-	-
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	1.400 (0.003)	-	0.330 (0.003)	-	0.540 (0.003)	-	1.400 (0.003)	-	-
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	2.600 (0.003)	-	0.440 (0.003)	-	0.710 (0.003)	-	1.900 (0.003)	-	-
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	0.950 (0.003)	-	0.390 (0.003)	-	0.390 (0.003)	-	1.700 (0.003)	-	-
Chrysene	mg/kg	760[A]	230[B]	-	2.300 (0.003)	-	0.420 (0.003)	-	0.630 (0.003)	-	2.000 (0.003)	-	-
Fluorene	mg/kg	130000[A]	3800[B]	-	0.079 J (0.003)	-	0.049 J (0.003)	-	ND (0.210) (0.003)	-	3.600 (0.003)	-	-
Naphthalene	mg/kg	760[A]	25[B]	-	1.200 (0.003)	-	0.270 (0.003)	-	0.180 J (0.003)	-	9.300 (0.003)	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	-	0.930 (0.003)	-	0.340 (0.003)	-	0.400 (0.003)	-	10.000 (0.003)	-	-
Pyrene	mg/kg	96000[A]	2200[B]	-	3.000 (0.003)	-	0.490 (0.003)	-	0.890 (0.003)	-	2.800 (0.003)	-	-
Metals													
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	240 (8.4)
Lead	mg/kg	2240[A]	450[B]	168 (0.510)	-	170 (0.510)	-	6.22 (0.510)	-	207 (0.510)	-	***1260*** [B] (0.75)	-
General Chemistry													
Moisture, Percent	%	n/v	n/v	14.6 (0.50)	26.2 (0.50)	17.5 (0.50)	9.1 (0.50)	4.8 (0.50)	21.2 (0.50)	30.1 (0.50)	40.2 (0.50)	43.5 (0.5)	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc. Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-03-06		BH-13-06	BH-14-06		BH-20-06	BH-21-06	BH-22-06	BH-23-06	BH-24-06
Sample Date				22-Mar-06	22-Mar-06	22-Mar-06	23-Mar-06	23-Mar-06	20-Mar-06	20-Mar-06	21-Mar-06	21-Mar-06	21-Mar-06
Sample ID				BH-03-06-032206-1.5-2	BH-03-06-032206-1.5-2	BH-13-06-032206-1-1.5	BH-14-06-032306-0.5-1	BH-14-06-032306-0.5-1	BH-20-06-032006-1-1.5	BH-21-06-032006-1.5-2	BH-22-06-032106-1.5-2	BH-23-06-032106-1-1.5	BH-24-06-032106-1-1.5
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4736394	4739180	4736396	4736397	4739182	4734389	4734390	4734394	4734391	4734392
Volatile Organic Compounds													
Benzene	mg/kg	290[A]	0.5[B]	-	-	-	-	-	0.290 (0.016)	0.340 (0.017)	ND (0.004) (0.0003)	ND (0.210) (0.017)	ND (0.170) (0.015)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	-	-	-	-	-	*ND (0.200)* (0.031)	*ND (0.190)* (0.035)	ND (0.004) (0.0006)	*ND (0.210)* (0.033)	*ND (0.170)* (0.03)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	-	-	-	-	-	ND (0.200) (0.031)	ND (0.190) (0.035)	ND (0.004) (0.0006)	ND (0.210) (0.033)	ND (0.170) (0.03)
Ethylbenzene	mg/kg	890[A]	70[B]	-	-	-	-	-	0.460 (0.031)	0.810 (0.035)	ND (0.004) (0.0006)	ND (0.210) (0.033)	ND (0.170) (0.03)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	-	-	-	-	-	9.7 (0.31)	32 (0.35)	ND (0.004) (0.0006)	0.810 (0.033)	9.9 (0.03)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	-	-	-	-	-	ND (0.200) (0.016)	ND (0.190) (0.017)	ND (0.004) (0.0003)	ND (0.210) (0.017)	ND (0.170) (0.015)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	-	-	-	-	-	0.410 (0.031)	ND (0.190) (0.035)	ND (0.004) (0.0006)	ND (0.210) (0.033)	0.200 (0.03)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	-	-	-	-	-	1.0 (0.031)	0.830 (0.035)	ND (0.004) (0.0006)	0.370 (0.033)	0.560 (0.03)
Semi-Volatile Organic Compounds													
Anthracene	mg/kg	190000[A]	350[B]	-	-	-	-	-	2.5 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	1.3 (0.1)	3.9 (0.33)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	-	-	-	-	3.8 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	0.790 (0.1)	ND (1.9) (0.33)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	-	-	-	-	4.9 (0.33)	ND (1.8) (0.33)	0.350 (0.033)	1.1 (0.1)	ND (1.9) (0.33)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	-	-	-	-	6.3 (0.33)	ND (1.8) (0.33)	0.400 (0.033)	1.2 (0.1)	ND (1.9) (0.33)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	-	-	-	-	2.9 (0.33)	ND (1.8) (0.33)	0.290 (0.033)	0.890 (0.1)	ND (1.9) (0.33)
Chrysene	mg/kg	760[A]	230[B]	-	-	-	-	-	4.2 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	1.3 (0.1)	2.0 (0.33)
Fluorene	mg/kg	130000[A]	3800[B]	-	-	-	-	-	71 (0.67)	ND (1.8) (0.33)	ND (0.190) (0.033)	3.5 (0.1)	63 (0.67)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	ND (2.1) (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	0.980 (0.1)	ND (1.9) (0.33)
Phenanthrene	mg/kg	190000[A]	10000[B]	-	-	-	-	-	37 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	7.4 (0.1)	46 (0.33)
Pyrene	mg/kg	96000[A]	2200[B]	-	-	-	-	-	6.9 (0.33)	ND (1.8) (0.33)	0.220 (0.033)	1.6 (0.1)	5.8 (0.33)
Metals													
Lead	µg/L	n/v	n/v	-	90.1 (8.4)	-	-	1120 (8.4)	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	***1650*** [B] (0.757)	-	283 (0.757)	***1040*** [B] (0.75)	-	145 (0.757)	286 (0.757)	165 (0.757)	417 (0.772)	233 (0.772)
General Chemistry													
Moisture, Percent	%	n/v	n/v	33.5 (0.5)	-	38.3 (0.5)	33.1 (0.5)	-	20.4 (0.5)	9.7 (0.5)	10 (0.5)	20.2 (0.5)	14.4 (0.5)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-25-06	BH-26-06	BH-27-06	BH-27-09	BH-28-06	BH-28-09	BH-29-06	BH-29-09	BH-30-09	BH-31-09	BH-32-09
Sample Date				21-Mar-06	24-Mar-06	23-Mar-06	8-Apr-09	23-Mar-06	8-Apr-09	21-Mar-06	8-Apr-09	8-Apr-09	13-Jul-09	13-Jul-09
Sample ID				BH-25-06-032106-1-1.5	BH-26-06-032406-0.5-1	BH-27-06-032306-1-1.5	BH-27-09	BH-28-06-032306-1-1.5	BH-28-09	BH-29-06-032106-1.5-2	BH-29-09	BH-30-09	BH-31-09	BH-32-09
Sample Depth				1 - 1.5 ft	0.5 - 1 ft	1 - 1.5 ft	0 - 2 ft	1 - 1.5 ft	0 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4734393	4738884	4736392	5643349	4736393	5643346	4734395	5643347	5643348	5722433	5722432
Volatile Organic Compounds														
Benzene	mg/kg	290[A]	0.5[B]	***2.3***[B] (0.018)	***180***[B] (1.6)	***2.2***[B] (0.016)	-	***1.3***[B] (0.033)	-	0.410 (0.018)	-	-	-	-
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.220)* (0.035)	*ND (0.180)* (0.033)	*ND (0.180)* (0.031)	-	*ND (0.380)* (0.066)	-	*ND (0.230)* (0.037)	-	-	-	-
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.220) (0.035)	ND (0.180) (0.033)	ND (0.180) (0.031)	-	ND (0.380) (0.066)	-	ND (0.230) (0.037)	-	-	-	-
Ethylbenzene	mg/kg	890[A]	70[B]	0.300 (0.035)	2.7 (0.033)	1.6 (0.031)	-	0.670 (0.066)	-	ND (0.230) (0.037)	-	-	-	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	2.7 (0.035)	800 (3.3)	9.1 (0.031)	-	6.4 (0.066)	-	0.990 (0.037)	-	-	-	-
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.220) (0.018)	ND (0.180) (0.016)	ND (0.180) (0.016)	-	ND (0.380) (0.033)	-	ND (0.230) (0.018)	-	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	1.7 (0.035)	***260***[B] (3.3)	ND (0.180) (0.031)	-	0.590 (0.066)	-	ND (0.230) (0.037)	-	-	-	-
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	1.1 (0.035)	9.3 (0.033)	0.770 (0.031)	-	0.580 (0.066)	-	0.560 (0.037)	-	-	-	-
Semi-Volatile Organic Compounds														
Anthracene	mg/kg	190000[A]	350[B]	10 (0.33)	ND (0.180) (0.033)	3.3 (0.33)	-	2.5 (0.033)	-	27 (0.33)	-	-	-	-
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	5.3 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-	4.0 (0.033)	-	70 (1.7)	-	-	-	-
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	6.0 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-	4.2 (0.17)	-	***59***[AB] (1.7)	-	-	-	-
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	8.1 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-	6.0 (0.17)	-	75 (1.7)	-	-	-	-
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	3.6 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-	1.9 (0.033)	-	29 (0.33)	-	-	-	-
Chrysene	mg/kg	760[A]	230[B]	4.8 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-	4.3 (0.033)	-	73 (1.7)	-	-	-	-
Fluorene	mg/kg	130000[A]	3800[B]	120 (1.7)	ND (0.180) (0.033)	16 (0.33)	-	12 (0.17)	-	14 (0.33)	-	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	2.4 (0.33)	ND (0.180) (0.033)	12 (0.33)	-	1.0 (0.033)	-	2.4 (0.33)	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	120 (1.7)	0.210 (0.033)	36 (0.33)	-	16 (0.17)	-	91 (1.7)	-	-	-	-
Pyrene	mg/kg	96000[A]	2200[B]	11 (0.33)	0.300 (0.033)	2.0 (0.33)	-	8.9 (0.17)	-	110 (1.7)	-	-	-	-
Metals														
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	231 (0.772)	32.6 (0.765)	167 (0.772)	***463***[B] (0.015)	200 (0.757)	***993***[B] (0.015)	***2520***[AB] (0.772)	409 (0.015)	***2310***[AB] (0.015)	***501***[B] (0.02)	186 (0.02)
General Chemistry														
Moisture, Percent	%	n/v	n/v	19.4 (0.5)	9 (0.5)	12.4 (0.5)	14.6 (0.5)	12.8 (0.5)	23 (0.5)	20.2 (0.5)	10.1 (0.5)	15.1 (0.5)	7.5 (0.5)	9.7 (0.5)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP U 677-1	GP U 677-2	GP U 677-3	GP U 677-4	GP U 677-5	GP 797-HA-1	GP 797-HA-2	GP 797-HA-3		GP 797-HA-4	GP-1088-SS-1	GP-1088-SS-2
Sample Date				8-Jun-11	8-Jun-11	8-Jun-11	8-Jun-11	8-Jun-11	29-Aug-02	24-May-02	24-May-02	24-May-02	24-May-02	26-Mar-08	26-Mar-08
Sample ID				GP U 677-1(1.5-2.0)	GP U 677-2(0.8-1.3)	GP U 677-3(1.5-2.0)	GP U 677-4(0.3-0.8)	GP U 677-5(0.8-1.3)	HA-1 (1-1.5)	HA-2 (1-1.5)	HA-3 (1-1.5)	HA-3 (2)	HA-4 (1-1.5)	GP-1088-SS-1	GP-1088-SS-2
Sample Depth				1.5 - 2 ft	0.8 - 1.3 ft	1.5 - 2 ft	0.3 - 0.8 ft	0.8 - 1.3 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	WGI	WGI	WGI	WGI	WGI	LL	LL
Laboratory Work Order		A	B	1250778	1250778	1250778	1250778	1250778	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	1083612	1083612
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6311687	6311688	6311689	6311690	6311691	HA-1 (1-1.5)	HA-2 (1-1.5)	HA-3 (1-1.5)	HA-3 (2)	HA-4 (1-1.5)	5315612	5315613
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	0.060 J (0.0005)	ND (0.0006) (0.0005)	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)	***920 D[AB]*** ()	***28 D[B]*** ()	***310 D[AB]*** ()	***170 D[B]*** ()	***190 D[B]*** ()	-	-
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	***0.130 J[B]*** (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	-	-	-	-	-	-	-
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.070) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	890[A]	70[B]	0.110 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	***80 J D[B]*** ()	0.85 ()	37 J D ()	8.5 ()	55 D ()	-	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	0.700 (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	1600 D ()	17 D ()	1000 D ()	230 D ()	950 D ()	-	-
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	310 D ()	4.5 ()	140 D ()	29 D ()	210 D ()	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.035) (0.0005)	ND (0.0006) (0.0005)	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)	ND (0.24) ()	ND (0.26) ()	ND (0.27) ()	ND (0.25) ()	ND (0.25) ()	-	-
Naphthalene	mg/kg	760[A]	25[B]	0.290 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.160 (0.001)	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	71 D ()	1.4 ()	29 J D ()	7.7 ()	50 J D ()	-	-
Toluene	mg/kg	10000[A]	100[B]	0.120 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.001 J (0.001)	***1800 D[B]*** ()	11 D ()	***920 D[B]*** ()	***300 D[B]*** ()	***660 D[B]*** ()	-	-
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	0.097 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.056 (0.001)	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.070) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.046 (0.001)	-	-	-	-	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	0.420 (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.005 (0.001)	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	0.780 (0.00067)	0.037 J (0.00067)	0.500 (0.00067)	ND (0.028) (0.00067)	0.990 (0.00067)	-	-	-	-	-	-	-
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	1.0 (0.00033)	0.110 (0.00033)	1.2 (0.00033)	0.031 (0.00033)	ND (0.590) (0.00033)	-	-	-	-	-	-	-
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	1.2 (0.00033)	0.120 (0.00033)	1.2 (0.00033)	0.050 (0.00033)	0.620 (0.00033)	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	0.800 (0.00027)	0.091 (0.00027)	0.850 (0.00027)	0.053 (0.00027)	0.810 (0.00027)	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	1.7 (0.0020)	0.190 J (0.0020)	1.5 (0.0020)	0.130 J (0.0020)	1.4 (0.0020)	-	-	-	-	-	-	-
Chrysene	mg/kg	760[A]	230[B]	2.0 (0.0030)	0.160 (0.0030)	1.6 (0.0030)	0.250 (0.0030)	4.3 (0.0030)	-	-	-	-	-	-	-
Fluorene	mg/kg	130000[A]	3800[B]	1.3 (0.0033)	ND (0.085) (0.0033)	0.390 (0.0033)	ND (0.071) (0.0033)	2.5 (0.0033)	-	-	-	-	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	0.65 ()	ND (0.26) ()	0.41 ()	0.3 ()	0.29 ()	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	2.2 (0.0020)	0.090 J (0.0020)	1.6 (0.0020)	0.095 J (0.0020)	5.2 (0.0020)	-	-	-	-	-	-	-
Pyrene	mg/kg	96000[A]	2200[B]	1.5 (0.0033)	0.240 J (0.0033)	2.3 (0.0033)	ND (0.370) (0.0033)	ND (17) (0.0033)	-	-	-	-	-	-	-
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	***453[B]*** (0.220)	67.0 (0.220)	***451[B]*** (0.220)	47.8 (0.220)	18.5 (0.220)	-	-	-	-	-	-	-
General Chemistry															
Moisture, Percent	%	n/v	n/v	21.1 (0.50)	21.2 (0.50)	22.2 (0.50)	6.1 (0.50)	6.9 (0.50)	-	-	-	-	-	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	11.2 (0.0100)	10.4 (0.0100)
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				**GP-1088-SS-3**	**GP-1088-SS-4**	**GP-1088-SS-5**	**GP-1088-SS-6**	**GP-1088-SS-7**	**GP-1088-SS-8**	**GP-201-SS-1**	**GP-201-SS-2**	**GP-201-SS-3**	**GP-201-SS-4**	**GP-201-SS-5**	**GP-201-SS-6**
Sample Date				**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**	**26-Mar-08**
Sample ID				**GP-1088-SS-3**	**GP-1088-SS-4**	**GP-1088-SS-5**	**GP-1088-SS-6**	**GP-1088-SS-7**	**GP-1088-SS-8**	**GP-201-SS-1**	**GP-201-SS-2**	**GP-201-SS-3**	**GP-201-SS-4**	**GP-201-SS-5**	**GP-201-SS-6**
Sample Depth				**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**	**0 - 0.5 ft**
Sampling Company				**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory				**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**
Laboratory Work Order		**A**	**B**	**1083612**	**1083612**	**1083612**	**1083612**	**1083612**	**1083612**	**1083613**	**1083613**	**1083613**	**1083613**	**1083613**	**1083613**
Laboratory Sample ID	**Units**	**MSC-PA**	**SHS-PA**	**5315614**	**5315615**	**5315616**	**5315617**	**5315618**	**5315619**	**5315620**	**5315621**	**5315622**	**5315623**	**5315624**	**5315625**
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	890[A]	70[B]	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	-	-	-	-	-	-	-	-	-	-	-	-
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	760[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	130000[A]	3800[B]	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	96000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry															
Moisture, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	10.1 (0.0100)	10.3 (0.0100)	10.7 (0.0100)	11.6 (0.0100)	10.1 (0.0100)	10.5 (0.0100)	8.88 (0.01)	9.00 (0.01)	8.53 (0.01)	8.55 (0.01)	8.88 (0.01)	7.89 (0.01)
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				**GP-201-SS-7**	**GP676-1**	**GP676-2**	**GP676-3**	**GP676-4**	**GP676-5**	**GP676-6**	**GP676-7**	**GP676-8**	**GP676-9**	**SR-31-1**	**SR-31-2**
Sample Date				**26-Mar-08**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**28-Apr-16**	**7-Jun-11**	**7-Jun-11**
Sample ID				**GP-201-SS-7**	**GP676-1-(1.5')-20160428**	**GP676-2-(1.5')-20160428**	**GP676-3-(1.5')-20160428**	**GP676-4-(1.5')-20160428**	**GP676-5-(1.5')-20160428**	**GP676-6-(1.5')-20160428**	**GP676-7-(1.5')-20160428**	**GP676-8-(1.5')-20160428**	**GP676-9-(1.5')-20160428**	**SR-31-1(1.3-1.8)**	**SR-31-2(0.9-1.4)**
Sample Depth				**0 - 0.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.5 ft**	**1.3 - 1.8 ft**	**0.9 - 1.4 ft**
Sampling Company				**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**UNKNOWN**	**UNKNOWN**
Laboratory				**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**
Laboratory Work Order		**A**	**B**	**1083613**	**1655906**	**1655906**	**1655906**	**1655906**	**1655906**	**1655906**	**1655906**	**1655906**	**1655906**	**1250778**	**1250778**
Laboratory Sample ID	**Units**	**MSC-PA**	**SHS-PA**	**5315626**	**8358306**	**8358307**	**8358308**	**8358309**	**8358310**	**8358311**	**8358312**	**8358313**	**8358314**	**6311678**	**6311679**
Volatile Organic Compounds															
Benzene	mg/kg	290[A]	0.5[B]	-	0.051 J (0.0005)	ND (0.064) (0.0005)	ND (0.13) (0.0005)	ND (0.0007) (0.0005)	ND (0.031) (0.0005)	ND (0.033) (0.0005)	ND (0.035) (0.0005)	ND (0.033) (0.0005)	ND (0.038) (0.0005)	0.044 (0.0005)	0.002 J (0.0005)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	ND (0.003) (0.001)	ND (0.002) (0.001)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	-	-	-	-	-	-	-	-	-	-	ND (0.003) (0.001)	ND (0.002) (0.001)
Ethylbenzene	mg/kg	890[A]	70[B]	-	-	-	-	-	-	-	-	-	-	0.015 (0.001)	ND (0.002) (0.001)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	-	-	-	-	-	-	-	-	-	-	0.006 J (0.001)	ND (0.002) (0.001)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	-	-	-	-	-	-	-	-	-	-	ND (0.001) (0.0005)	ND (0.0009) (0.0005)
Naphthalene	mg/kg	760[A]	25[B]	-	0.37 J (0.001)	ND (0.13) (0.001)	ND (0.25) (0.001)	ND (0.001) (0.001)	0.094 J (0.001)	0.14 J (0.001)	ND (0.070) (0.001)	ND (0.067) (0.001)	ND (0.077) (0.001)	0.008 J (0.001)	0.006 J (0.001)
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	-	-	-	-	-	-	-	-	-	-	0.041 (0.001)	0.002 J (0.001)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-	0.038 (0.001)	ND (0.002) (0.001)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-	0.150 (0.001)	ND (0.002) (0.001)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	-	-	-	-	-	-	-	-	-	-	0.110 (0.001)	0.002 J (0.001)
Semi-Volatile Organic Compounds															
Anthracene	mg/kg	190000[A]	350[B]	-	0.50 (0.003)	8.0 (0.003)	0.42 (0.003)	1.2 (0.003)	0.67 (0.003)	0.29 (0.003)	1.0 J (0.003)	0.97 (0.003)	1.9 (0.003)	0.089 (0.00067)	0.380 (0.00067)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	-	0.93 (0.003)	9.3 (0.003)	0.81 (0.003)	2.9 (0.003)	1.9 (0.003)	0.68 (0.003)	0.83 J (0.003)	1.5 (0.003)	0.61 J (0.003)	0.540 (0.00033)	2.9 (0.00033)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	-	0.93 (0.003)	5.2 (0.003)	0.87 (0.003)	3.8 (0.003)	1.9 (0.003)	0.56 (0.003)	1.5 (0.003)	0.86 (0.003)	0.59 J (0.003)	0.640 (0.00033)	2.8 (0.00033)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	-	1.1 (0.003)	2.6 (0.003)	1.2 (0.003)	4.2 (0.003)	2.2 (0.003)	0.40 (0.003)	0.61 J (0.003)	0.46 (0.003)	0.66 J (0.003)	0.570 (0.00027)	2.6 (0.00027)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	0.75 (0.003)	1.7 (0.003)	0.66 (0.003)	2.9 (0.003)	1.3 (0.003)	0.25 (0.003)	1.2 (0.003)	0.36 (0.003)	0.67 J (0.003)	0.830 (0.0020)	3.3 (0.0020)
Chrysene	mg/kg	760[A]	230[B]	-	0.99 (0.003)	15 (0.003)	0.99 (0.003)	3.0 (0.003)	2.0 (0.003)	1.2 (0.003)	3.1 (0.003)	2.2 (0.003)	0.99 J (0.003)	0.890 (0.0030)	4.0 (0.0030)
Fluorene	mg/kg	130000[A]	3800[B]	-	0.24 (0.003)	9.8 (0.003)	0.39 (0.003)	0.46 (0.003)	0.27 (0.003)	0.28 (0.003)	1.0 J (0.003)	0.85 (0.003)	3.1 (0.003)	0.160 J (0.0033)	0.370 J (0.0033)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	-	1.3 (0.003)	38 (0.003)	1.0 (0.003)	3.4 (0.003)	1.3 (0.003)	1.3 (0.003)	4.0 (0.003)	3.4 (0.003)	13 (0.003)	0.490 (0.0020)	1.4 (0.0020)
Pyrene	mg/kg	96000[A]	2200[B]	-	1.2 (0.003)	18 (0.003)	1.0 (0.003)	3.1 (0.003)	2.0 (0.003)	1.4 (0.003)	3.7 (0.003)	2.8 (0.003)	2.6 (0.003)	1.2 (0.0033)	5.0 (0.0033)
Metals															
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	-	-	-	-	-	-	-	-	-	-	***1120*** [B] (0.220)	***898*** [B] (0.220)
General Chemistry															
Moisture, Percent	%	n/v	n/v	-	26.4 (0.50)	17.3 (0.50)	32.3 (0.50)	28.9 (0.50)	17.9 (0.50)	18.6 (0.50)	16.9 (0.50)	23.2 (0.50)	22.8 (0.50)	31.1 (0.50)	37.4 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	7.99 (0.01)	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4a

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				**SR-31-3**	**SR-31-4**	**SR-31-5**	**SR-31-6**	**SR-31-7**	**SR-31-8**	**SR-31-9**
Sample Date				**7-Jun-11**	**7-Jun-11**	**7-Jun-11**	**7-Jun-11**	**7-Jun-11**	**7-Jun-11**	**7-Jun-11**
Sample ID				**SR-31-3(0.8-1.3)**	**SR-31-4(0.9-1.4)**	**SR-31-5(0.8-1.3)**	**SR-31-6(1.0-1.5)**	**SR-31-7(1.1-1.6)**	**SR-31-8(0.5-1.0)**	**SR-31-9(1.2-1.7)**
Sample Depth				**0.8 - 1.3 ft**	**0.9 - 1.4 ft**	**0.8 - 1.3 ft**	**1 - 1.5 ft**	**1.1 - 1.6 ft**	**0.5 - 1 ft**	**1.2 - 1.7 ft**
Sampling Company				**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**	**UNKNOWN**
Laboratory				**LL**	**LL**	**LL**	**LL**	**LL**	**LL**	**LL**
Laboratory Work Order		**A**	**B**	**1250778**	**1250778**	**1250778**	**1250778**	**1250778**	**1250778**	**1250778**
Laboratory Sample ID	**Units**	**MSC-PA**	**SHS-PA**	**6311680**	**6311681**	**6311682**	**6311683**	**6311684**	**6311685**	**6311686**
Volatile Organic Compounds										
Benzene	mg/kg	290[A]	0.5[B]	0.003 J (0.0005)	0.001 J (0.0005)	ND (0.065) (0.0005)	ND (0.045) (0.0005)	0.001 J (0.0005)	0.005 J (0.0005)	ND (0.0006) (0.0005)
1,2-Dibromoethane (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	*ND (0.130)* (0.001)	*ND (0.089)* (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,2-Dichloroethane (EDC)	mg/kg	86[A]	0.5[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
Ethylbenzene	mg/kg	890[A]	70[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
m, p-Xylenes	mg/kg	n/v	n/v	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	8600[A]	2[B]	ND (0.0008) (0.0005)	ND (0.0008) (0.0005)	ND (0.065) (0.0005)	ND (0.045) (0.0005)	ND (0.0009) (0.0005)	ND (0.0007) (0.0005)	ND (0.0006) (0.0005)
Naphthalene	mg/kg	760[A]	25[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	0.200 J (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
o-Xylene (1,2-Dimethylbenzene)	mg/kg	n/v	n/v	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.002 J (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	0.002 J (0.001)	ND (0.001) (0.001)
1,2,4-Trimethylbenzene	mg/kg	560[A]	35[B]	0.002 J (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
Xylenes, Total (Dimethylbenzene)	mg/kg	8000[A]	1000[B]	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000[A]	350[B]	0.180 (0.00067)	0.034 J (0.00067)	0.110 (0.00067)	0.260 (0.00067)	0.100 (0.00067)	0.050 J (0.00067)	0.140 (0.00067)
Benzo(a)Anthracene	mg/kg	130[A]	130[B]	0.730 (0.00033)	0.190 (0.00033)	0.340 (0.00033)	2.0 (0.00033)	0.380 (0.00033)	0.370 (0.00033)	0.580 (0.00033)
Benzo(a)Pyrene	mg/kg	12[A]	12[B]	0.810 (0.00033)	0.220 (0.00033)	0.420 (0.00033)	1.8 (0.00033)	0.440 (0.00033)	0.470 (0.00033)	0.770 (0.00033)
Benzo(b)Fluoranthene	mg/kg	76[A]	76[B]	0.620 (0.00027)	0.190 (0.00027)	0.350 (0.00027)	1.6 (0.00027)	0.360 (0.00027)	0.380 (0.00027)	0.680 (0.00027)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.950 (0.0020)	0.330 (0.0020)	0.610 (0.0020)	2.2 (0.0020)	0.590 (0.0020)	0.620 (0.0020)	1.0 (0.0020)
Chrysene	mg/kg	760[A]	230[B]	1.2 (0.0030)	0.360 (0.0030)	0.680 (0.0030)	2.5 (0.0030)	0.570 (0.0030)	0.590 (0.0030)	1.0 (0.0030)
Fluorene	mg/kg	130000[A]	3800[B]	ND (0.190) (0.0033)	ND (0.100) (0.0033)	ND (0.120) (0.0033)	0.180 J (0.0033)	ND (0.110) (0.0033)	ND (0.093) (0.0033)	0.120 J (0.0033)
Naphthalene	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	0.660 (0.0020)	0.130 J (0.0020)	0.250 (0.0020)	1.0 (0.0020)	0.420 (0.0020)	0.200 (0.0020)	0.480 (0.0020)
Pyrene	mg/kg	96000[A]	2200[B]	1.5 (0.0033)	0.460 (0.0033)	0.730 (0.0033)	3.6 (0.0033)	0.690 (0.0033)	0.660 (0.0033)	1.2 (0.0033)
Metals										
Lead	µg/L	n/v	n/v	-	-	-	-	-	-	-
Lead	mg/kg	2240[A]	450[B]	***774*** [B] (0.220)	***2210*** [B] (0.220)	***1890*** [B] (0.220)	***780*** [B] (0.220)	***1370*** [B] (0.220)	***1560*** [B] (0.220)	***830*** [B] (0.220)
General Chemistry										
Moisture, Percent	%	n/v	n/v	33.3 (0.50)	36.1 (0.50)	46.5 (0.50)	28.1 (0.50)	36.8 (0.50)	28.3 (0.50)	25.4 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific
[A]	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential
	Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
[B]	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table 4b

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-101	AOI6 BH-12-102	AOI6 BH-12-105	AOI6 BH-12-106	AOI6 BH-12-107	AOI6 BH-12-108	AOI6 BH-12-109	AOI6 BH-12-110	AOI6 BH-12-114	AOI6 BH-12-116	AOI6 BH-12-117	AOI6 BH-12-118	AOI6 BH-12-121	AOI6 BH-12-122
Sample Date				4-Dec-12	4-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	4-Dec-12	3-Dec-12	3-Dec-12
Sample ID				BH-12-101_2-3'	BH-12-102_2-2.5'	BH-12-105_2-2.5'	BH-12-106_2-2.5'	BH-12-107_2.5-3'	BH-12-108_2-2.5'	BH-12-109_3'	BH-12-110_3-3.5'	BH-12-114_3-3.5'	BH-12-116_3.5'	BH-12-117_2-2.5'	BH-12-118_2-2.5'	BH-12-121_2-2.5'	BH-12-122_2.5-3'
Sample Depth				2 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22962	JB22962	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22962	JB22822	JB22822
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-19	JB22962-18	JB22822-7	JB22822-9	JB22822-4	JB22822-13	JB22822-16	JB22822-5	JB22822-14	JB22822-17	JB22822-19	JB22962-17	JB22822-21	JB22822-20
Volatile Organic Compounds																	
Benzene	mg/kg	330[A]	0.5[B]	0.121 (0.0075)	ND (0.13) (0.016)	***5.21[B]*** (0.042)	0.0011 (0.00011)	0.00066 J (0.00013)	***11.2[B]*** (0.028)	0.476 (0.0073)	***4.09[B]*** (0.042)	0.245 (0.0070)	0.0680 (0.0066)	0.157 (0.0082)	0.00051 J (0.00012)	0.0100 (0.00010)	***1.83[B]*** (0.0066)
Cyclohexane	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	*ND (0.063)* (0.0080)	*ND (0.13)* (0.017)	*ND (0.36)* (0.045)	ND (0.00094) (0.00012)	ND (0.0011) (0.00014)	*ND (0.23)* (0.030)	*ND (0.061)* (0.0078)	*ND (0.35)* (0.045)	*ND (0.059)* (0.0075)	*ND (0.056)* (0.0071)	*ND (0.069)* (0.0088)	ND (0.00099) (0.00013)	ND (0.00084) (0.00011)	*ND (0.056)* (0.0071)
1,2-Dichloroethane (EDC)	mg/kg	98[A]	0.5[B]	ND (0.063) (0.0086)	ND (0.13) (0.018)	ND (0.36) (0.048)	ND (0.00094) (0.00013)	ND (0.0011) (0.00014)	ND (0.23) (0.032)	ND (0.061) (0.0082)	ND (0.35) (0.048)	ND (0.059) (0.0080)	ND (0.056) (0.0075)	ND (0.069) (0.0093)	ND (0.00099) (0.00013)	ND (0.00084) (0.00011)	ND (0.056) (0.0075)
Ethylbenzene	mg/kg	1000[A]	70[B]	0.0679 (0.017)	ND (0.13) (0.035)	0.976 (0.094)	ND (0.00094) (0.00025)	ND (0.0011) (0.00028)	***109[B]*** (0.61)	0.153 (0.016)	0.712 (0.093)	0.107 (0.016)	0.0714 (0.015)	0.0258 J (0.018)	ND (0.00099) (0.00026)	0.00029 J (0.00022)	0.191 (0.015)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	0.382 (0.0047)	1.18 (0.0098)	5.76 (0.026)	0.00068 J (0.000070)	ND (0.0053) (0.000079)	58.7 (0.17)	1.55 (0.0045)	23.1 (0.026)	0.387 (0.0044)	0.524 (0.0041)	0.797 (0.0051)	0.00031 J (0.000074)	0.0017 J (0.000062)	0.720 (0.0041)
Methyl Tertiary Butyl Ether	mg/kg	9900[A]	2[B]	ND (0.063) (0.015)	ND (0.13) (0.031)	ND (0.36) (0.084)	ND (0.00094) (0.00022)	ND (0.0011) (0.00025)	ND (0.23) (0.055)	ND (0.061) (0.014)	ND (0.35) (0.083)	ND (0.059) (0.014)	ND (0.056) (0.013)	ND (0.069) (0.016)	ND (0.00099) (0.00023)	ND (0.00084) (0.00020)	ND (0.056) (0.013)
Hexane	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000[A]	25[B]	0.0387 J (0.0077)	ND (0.66) (0.016)	0.966 J (0.043)	0.0020 J (0.00011)	ND (0.0053) (0.00013)	***65.2[B]*** (0.28)	0.512 (0.0074)	2.49 (0.043)	0.197 J (0.0072)	0.161 J (0.0068)	0.0757 J (0.0084)	ND (0.0050) (0.00012)	0.0018 J (0.00010)	0.500 (0.0068)
Butylbenzene, Sec-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene, Tert-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.0940 (0.0067)	0.0547 J (0.014)	0.330 J (0.037)	ND (0.00094) (0.000098)	ND (0.0011) (0.00011)	5.26 (0.025)	0.0993 (0.0064)	0.889 (0.037)	0.224 (0.0062)	0.100 (0.0058)	0.0813 (0.0072)	0.00026 J (0.00010)	0.0020 (0.000088)	0.261 (0.0058)
1,2,4-Trimethylbenzene	mg/kg	640[A]	35[B]	0.0245 J (0.013)	ND (0.66) (0.027)	3.11 (0.074)	ND (0.0047) (0.00020)	ND (0.0053) (0.00022)	***455[B]*** (2.0)	0.121 J (0.013)	4.23 (0.074)	0.131 J (0.012)	0.135 J (0.012)	0.0555 J (0.014)	ND (0.0050) (0.00021)	0.0022 J (0.00018)	0.291 (0.012)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.32) (0.010)	ND (0.66) (0.021)	1.01 J (0.057)	ND (0.0047) (0.00015)	ND (0.0053) (0.00017)	191 (0.37)	0.0553 J (0.0098)	1.13 J (0.057)	0.0385 J (0.0094)	0.0469 J (0.0089)	ND (0.35) (0.011)	ND (0.0050) (0.00016)	0.0018 J (0.00013)	0.105 J (0.0089)
Xylenes, Total (Dimethylbenzene)	mg/kg	9100[A]	1000[B]	0.276 (0.0088)	0.0965 J (0.018)	4.24 (0.050)	ND (0.00094) (0.00013)	ND (0.0011) (0.00015)	675 (0.32)	0.170 (0.0085)	2.72 (0.049)	0.612 (0.0082)	0.245 (0.0077)	0.0616 J (0.0096)	ND (0.00099) (0.00014)	0.00097 (0.00012)	0.407 (0.0077)
Volatile Organic Compounds (SW8011)																	
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																	
Acenaphthene	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	190000[A]	350[B]	0.0217 J (0.013)	1.02 (0.017)	0.746 (0.012)	2.34 (0.012)	1.97 (0.012)	2.23 (0.011)	3.49 (0.025)	8.81 (0.52)	0.310 (0.013)	0.142 (0.012)	0.262 (0.014)	0.151 (0.012)	3.43 (0.11)	0.625 (0.011)
Benzo(a)Anthracene	mg/kg	190000[A]	430[B]	0.0907 (0.012)	0.276 (0.016)	1.85 (0.011)	10.9 (0.23)	4.21 (0.11)	6.04 (0.10)	10.9 (0.23)	22.3 (0.48)	0.699 (0.013)	0.233 (0.011)	0.436 (0.013)	0.608 (0.012)	9.60 (0.10)	1.05 (0.010)
Benzo(a)Pyrene	mg/kg	190000[A]	46[B]	0.112 (0.011)	0.246 (0.015)	1.55 (0.011)	11.6 (0.22)	3.59 (0.11)	5.93 (0.097)	10.5 (0.22)	20.6 (0.45)	0.653 (0.012)	0.269 (0.011)	0.534 (0.012)	0.602 (0.011)	9.39 (0.098)	1.06 (0.0097)
Benzo(b)Fluoranthene	mg/kg	190000[A]	170[B]	0.122 (0.012)	0.376 (0.016)	1.48 (0.012)	14.0 (0.24)	3.49 (0.12)	8.41 (0.11)	13.9 (0.24)	24.3 (0.49)	0.615 (0.013)	0.328 (0.012)	0.446 (0.013)	0.616 (0.012)	9.66 (0.11)	1.21 (0.011)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	0.0816 (0.014)	0.304 (0.018)	1.15 (0.013)	7.06 (0.26)	2.53 (0.013)	4.07 (0.12)	6.29 (0.027)	11.9 (0.55)	0.537 (0.014)	0.302 (0.013)	0.488 (0.014)	0.343 (0.013)	5.39 (0.12)	0.764 (0.012)
Benzo(k)Fluoranthene	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-Biphenyl	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl) Phthalate	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butyl Phthalate	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	190000[A]	230[B]	0.0917 (0.012)	0.400 (0.017)	1.82 (0.012)	11.1 (0.24)	3.92 (0.12)	7.37 (0.11)	13.7 (0.24)	22.0 (0.50)	0.872 (0.013)	0.290 (0.012)	0.664 (0.013)	0.599 (0.012)	10.5 (0.11)	1.28 (0.011)
Dibenz(A,H)Anthracene	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl Phthalate	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	190000[A]	3800[B]	0.0199 J (0.012)	5.64 (0.081)	2.30 (0.011)	0.818 (0.012)	0.848 (0.011)	15.8 (0.10)	6.98 (0.023)	11.4 (0.48)	0.177 (0.013)	0.120 (0.011)	0.0701 (0.013)	0.0297 J (0.012)	2.89 (0.010)	1.30 (0.010)
Indeno(1,2,3-c,d)Pyrene	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol, o- (2-Methylphenol)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol, p- (4-Methylphenol)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	0.0748 (0.017)	10.4 (0.11)	3.34 (0.016)	10.7 (0.32)	7.48 (0.16)	18.5 (0.14)	24.9 (0.32)	44.4 (0.67)	0.751 (0.017)	0.318 (0.016)	0.374 (0.018)	0.248 (0.016)	22.9 (0.15)	2.03 (0.014)
Phenol	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	190000[A]	2200[B]	0.121 (0.014)	1.05 (0.019)	2.89 (0.013)	18.7 (0.27)	7.59 (0.13)	11.3 (0.12)	19.7 (0.27)	41.9 (0.57)	1.24 (0.015)	0.446 (0.013)	0.984 (0.015)	0.728 (0.014)	23.1 (0.12)	1.95 (0.012)
Pyridine	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Cobalt	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	190000[A]	450[B]	56.3 (0.13)	283 (0.18)	341 (0.14)	***960[B]*** (0.26)	***546[B]*** (0.13)	383 (0.13)	***954[B]*** (0.13)	***2930[B]*** (0.28)	34.7 (0.14)	***1070[B]*** (0.13)	350 (0.14)	93.1 (0.13)	199 (0.12)	173 (0.13)
Nickel	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																	
Moisture, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	84.2 ()	65.9 ()	79.4 ()	83.4 ()	83.9 ()	90.9 ()	83.2 ()	78.3 ()	83.5 ()	83.7 ()	77.6 ()	86.9 ()	90.1 ()	88.1 ()

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016. Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Subsurface Soil (2-15 ft).
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016.
B	PADEP Non-Residential Statewide Health Standards (>2 ft bgs) (Unsaturated Soil).
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram.
ft	Feet.
	Method detection limit is shown in second set of parentheses.

Table 4b

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-123	AOI6 BH-12-124	AOI6 BH-12-125	AOI6 BH-12-126	AOI6 BH-12-127	AOI6 BH-12-128	AOI6 BH-12-129	AOI6 BH-12-135	AOI6 BH-12-138	AOI6 BH-12-149	AOI6-BH-16-007	AOI6-BH-16-008	AOI6-BH-16-014		AOI6-BH-16-015	
Sample Date				4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	5-Dec-12	5-Dec-12	4-Dec-12	8-Apr-16	8-Apr-16	5-Apr-16	11-Jul-16	5-Apr-16	11-Jul-16
Sample ID				BH-12-123_2-2.5'	BH-12-124_3-3.5'	BH-12-125_2.5-3'	BH-12-126_2.5-3'	BH-12-127_2.5-3'	BH-12-128_3-3.5'	BH-12-129_2.5-3'	BH-12-135_2-2.5'	BH-12-138_2-2.5'	BH-12-149_2.5-3'	AOI6-BH-16-007-2-4-SOIL	AOI6-BH-16-008-2-4-SOIL	AOI6-BH-16-014-2-4-SOIL	AOI6-BH-16-014-2-4-071116	AOI6-BH-16-015-2-4-SOIL	AOI6-BH-16-015-2-4-071116
Sample Depth				2 - 2.5 ft	3 - 3.5 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	3 - 3.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.25 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.25 ft	2 - 2.1 ft	2 - 2.2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	JB22962	JB22962	JB22962	JB22962	JB22962	JB22962	JB22962	JB23100	JB23100	JB22962	1649742	1649742	1647893	1682991	1647893	1682991
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-2	JB22962-3	JB22962-12	JB22962-8	JB22962-10	JB22962-9	JB22962-7	JB23100-12	JB23100-7	JB22962-5	8329538	8329541	8321193	8475491	8321191	8475489
Volatile Organic Compounds																			
Benzene	mg/kg	330[A]	0.5[B]	***2.07[B]*** (0.0059)	***1380[AB]*** (2.8)	*ND (2.5)* (0.29)	***87.2[B]*** (3.0)	***149[B]*** (0.30)	***535[AB]*** (1.5)	***1850[AB]*** (6.5)	ND (0.0013) (0.00015)	ND (0.0014) (0.00017)	***517[AB]*** (0.33)	0.004 J (0.0005)	0.001 J (0.0005)	ND (0.440) (0.0005)	-	ND (0.270) (0.0005)	-
Cyclohexane	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	*ND (0.049)* (0.0062)	*ND (0.47)* (0.060)	*ND (2.5)* (0.31)	*ND (0.26)* (0.032)	*ND (0.050)* (0.0064)	*ND (0.050)* (0.0064)	*ND (0.27)* (0.035)	ND (0.0013) (0.00016)	ND (0.0014) (0.00018)	*ND (1.4)* (0.18)	ND (0.005) (0.001)	ND (0.004) (0.001)	*ND (0.440)* (0.001)	-	*ND (0.270)* (0.001)	-
1,2-Dichloroethane (EDC)	mg/kg	98[A]	0.5[B]	ND (0.049) (0.0066)	ND (0.47) (0.064)	*ND (2.5)* (0.33)	ND (0.26) (0.034)	ND (0.050) (0.0068)	ND (0.050) (0.0068)	ND (0.27) (0.037)	ND (0.0013) (0.00017)	ND (0.0014) (0.00020)	*ND (1.4)* (0.19)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-
Ethylbenzene	mg/kg	1000[A]	70[B]	0.464 (0.013)	5.87 (0.12)	ND (2.5) (0.65)	14.6 (0.067)	18.7 (0.66)	57.8 (0.33)	12.6 (0.072)	ND (0.0013) (0.00034)	ND (0.0014) (0.00038)	ND (1.4) (0.37)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	16.9 (0.018)	2110 (1.8)	64.2 (0.18)	678 (1.9)	374 (0.19)	919 (0.94)	***6600[B]*** (4.0)	ND (0.0065) (0.000096)	ND (0.0072) (0.00011)	74.7 (0.10)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	0.230 J (0.001)	-
Methyl Tertiary Butyl Ether	mg/kg	9900[A]	2[B]	ND (0.049) (0.012)	ND (0.47) (0.11)	*ND (2.5)* (0.58)	ND (0.26) (0.060)	ND (0.050) (0.012)	ND (0.050) (0.012)	ND (0.27) (0.064)	0.00071 J (0.00030)	ND (0.0014) (0.00034)	ND (1.4) (0.33)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.440) (0.0005)	-	ND (0.270) (0.0005)	-
Hexane	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000[A]	25[B]	1.11 (0.0060)	0.479 J (0.058)	ND (12) (0.30)	0.304 J (0.031)	0.103 J (0.0061)	0.154 J (0.0062)	0.898 J (0.033)	-	-	ND (7.0) (0.17)	-	-	-	-	-	-
Butylbenzene, Sec-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene, Tert-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.722 (0.0052)	***1640[B]*** (2.5)	ND (2.5) (0.26)	***197[B]*** (2.7)	***339[B]*** (0.26)	***1050[B]*** (1.3)	***2070[B]*** (5.7)	ND (0.0013) (0.00014)	ND (0.0014) (0.00015)	21.2 (0.15)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.290 J (0.001)	-	ND (0.270) (0.001)	-
1,2,4-Trimethylbenzene	mg/kg	640[A]	35[B]	0.593 (0.010)	3.46 (0.099)	ND (12) (0.51)	4.62 (0.053)	3.04 (0.011)	6.32 (0.011)	9.43 (0.057)	ND (0.0065) (0.00027)	ND (0.0072) (0.00030)	ND (7.0) (0.29)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	0.240 J (0.0079)	1.21 J (0.076)	ND (12) (0.39)	2.08 (0.041)	1.41 (0.0080)	2.92 (0.0081)	3.38 (0.044)	ND (0.0065) (0.00021)	ND (0.0072) (0.00023)	ND (7.0) (0.23)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-
Xylenes, Total (Dimethylbenzene)	mg/kg	9100[A]	1000[B]	0.924 (0.0068)	22.6 (0.066)	0.738 J (0.34)	68.5 (0.035)	83.6 (0.35)	248 (0.18)	51.6 (0.038)	ND (0.0013) (0.00018)	ND (0.0014) (0.00020)	ND (1.4) (0.20)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.100 J (0.001)	-	0.092 J (0.001)	-
Volatile Organic Compounds (SW8011)																			
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																			
Acenaphthene	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	190000[A]	350[B]	2.32 (0.012)	ND (0.033) (0.012)	ND (0.035) (0.012)	ND (0.073) (0.026)	ND (0.032) (0.011)	ND (0.035) (0.012)	ND (0.070) (0.024)	0.485 (0.015)	0.180 (0.032)	ND (0.036) (0.013)	0.840 (0.003)	1.800 (0.003)	-	12.000 (0.003)	-	2.300 (0.003)
Benzo(a)Anthracene	mg/kg	190000[A]	430[B]	8.99 (0.11)	0.0210 J (0.011)	0.0226 J (0.012)	0.0707 J (0.024)	0.0184 J (0.010)	ND (0.035) (0.011)	0.177 (0.023)	0.992 (0.014)	0.424 (0.029)	0.403 (0.012)	2.200 (0.003)	3.700 (0.003)	-	25.000 (0.003)	-	1.200 (0.003)
Benzo(a)Pyrene	mg/kg	190000[A]	46[B]	7.91 (0.11)	0.0179 J (0.010)	ND (0.035) (0.011)	0.0491 J (0.022)	0.0138 J (0.0097)	ND (0.035) (0.011)	0.121 (0.021)	1.33 (0.013)	0.414 (0.027)	0.452 (0.011)	1.800 (0.003)	2.900 (0.003)	-	26.000 (0.003)	-	1.200 (0.003)
Benzo(b)Fluoranthene	mg/kg	190000[A]	170[B]	9.36 (0.12)	ND (0.033) (0.011)	ND (0.035) (0.012)	0.0556 J (0.024)	ND (0.032) (0.011)	ND (0.035) (0.012)	0.126 (0.023)	1.20 (0.014)	0.416 (0.030)	0.708 (0.012)	2.300 (0.003)	4.000 (0.003)	-	26.000 (0.003)	-	1.200 (0.003)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	3.58 (0.13)	ND (0.033) (0.012)	ND (0.035) (0.013)	0.0291 J (0.027)	ND (0.032) (0.012)	ND (0.035) (0.013)	0.0832 (0.026)	1.27 (0.015)	0.378 (0.034)	0.458 (0.013)	1.200 (0.003)	2.000 (0.003)	-	15.000 (0.003)	-	1.600 (0.003)
Benzo(k)Fluoranthene	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-Biphenyl	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl) Phthalate	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butyl Phthalate	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	190000[A]	230[B]	8.28 (0.12)	0.0197 J (0.011)	0.0298 J (0.012)	0.0845 (0.025)	0.0164 J (0.011)	ND (0.035) (0.012)	0.243 (0.024)	1.07 (0.014)	0.468 (0.030)	0.493 (0.012)	2.100 (0.003)	3.700 (0.003)	-	30.000 (0.003)	-	2.400 (0.003)
Dibenz(A,H)Anthracene	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl Phthalate	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	190000[A]	3800[B]	3.39 (0.012)	ND (0.033) (0.011)	ND (0.035) (0.012)	0.0340 J (0.024)	ND (0.032) (0.010)	ND (0.035) (0.012)	0.182 (0.023)	0.202 (0.014)	0.0565 J (0.030)	ND (0.036) (0.012)	0.310 (0.003)	1.700 (0.003)	-	12.000 (0.003)	-	2.600 (0.003)
Indeno(1,2,3-c,d)Pyrene	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol, o- (2-Methylphenol)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol, p- (4-Methylphenol)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000[A]	25[B]	-	-	-	-	-	-	-	0.524 (0.011)	0.0426 J (0.025)	-	0.710 (0.003)	1.500 (0.003)	-	24.000 (0.003)	-	6.300 (0.003)
4-Nitrophenol	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	6.10 (0.16)	0.0626 (0.015)	0.0208 J (0.016)	0.115 (0.033)	0.0161 J (0.015)	ND (0.035) (0.016)	0.437 (0.032)	1.16 (0.019)	0.609 (0.041)	0.154 (0.016)	2.600 (0.003)	8.800 (0.003)	-	37.000 (0.003)	-	7.200 (0.003)
Phenol	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	190000[A]	2200[B]	11.3 (0.14)	0.0317 J (0.013)	0.0363 (0.014)	0.123 (0.028)	0.0207 J (0.012)	ND (0.035) (0.013)	0.406 (0.027)	1.33 (0.016)	0.730 (0.035)	0.601 (0.014)	3.400 (0.003)	7.300 (0.003)	-	39.000 (0.003)	-	3.200 (0.003)
Pyridine	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																			
Cobalt	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	190000[A]	450[B]	133 (0.13)	5.5 (0.13)	11.4 (0.12)	8.7 (0.13)	13.8 (0.13)	6.5 (0.14)	107 (0.13)	311 (0.15)	***1150[B]*** (0.16)	127 (0.13)	243 (0.510)	267 (0.510)	352 (0.510)	-	134 (0.510)	-
Nickel	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																			
Moisture, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	17.6 (0.50)	14.8 (0.50)	44.3 (0.50)	34.8 (0.50)	21.6 (0.50)	30.5 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	89.2 ()	89.6 ()	90.5 ()	89.4 ()	88.8 ()	88.1 ()	88.5 ()	74.4 ()	70.5 ()	85.0 ()	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016. Medium-Specific
A	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Subsurface Soil (2-15 ft).
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016.
B	PADEP Non-Residential Statewide Health Standards (>2 ft bgs) (Unsaturated Soil).
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram.
ft	Feet.
	Method detection limit is shown in second set of parentheses.

Table 4b

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-016		AOI6-BH-16-022	AOI6-BH-16-027	AOI6-BH-16-029	AOI6-BH-16-030	AOI6-BH-16-031	AOI6-BH-16-032	AOI6-BH-16-033	AOI6-BH-16-034	AOI6-BH-16-035	AOI6-BH-16-036	AOI6-BH-16-043	B-166	B-167
Sample Date				4-Apr-16	11-Jul-16	6-Apr-16	13-Apr-16	13-Apr-16	14-Apr-16	14-Apr-16	13-Apr-16	13-Apr-16	13-Apr-16	13-Apr-16	14-Apr-16	7-Apr-16	13-Dec-12	13-Dec-12
Sample ID				AOI6-BH-16-016-2-4-SOIL	AOI6-BH-16-016-2-4-071116	AOI6-BH-16-022-2-4-SOIL	AOI6-BH-16-027-2-4-SOIL	AOI6-BH-16-029-2-4-SOIL	AOI6-BH-16-030-2-4-SOIL	AOI6-BH-16-031-2-4-SOIL	AOI6-BH-16-032-2-4-SOIL	AOI6-BH-16-033-2-4-SOIL	AOI6-BH-16-034-2-4-SOIL	AOI6-BH-16-035-2-4-SOIL	AOI6-BH-16-036-2-4-SOIL	AOI6-BH-16-043-2-4-SOIL	B-166_3'	B-167_4'
Sample Depth				2 - 2.5 ft	2 - 2.25 ft	2.25 - 2.5 ft	2.5 - 2.75 ft	2.25 - 2.5 ft	2.5 - 2.75 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.25 ft	2 - 2.25 ft	2 - 2.25 ft	2 - 2.25 ft	2 - 2.5 ft	2.5 - 3 ft	3.5 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1647893	1682991	1648963	1651423	1651423	1651423	1651423	1651423	1651423	1651423	1651423	1651423	1648963	JB23816	JB23816
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8321185	8475487	8325915	8336831	8336828	8336848	8336850	8336839	8336837	8336835	8336833	8336842	8325913	JB23816-4	JB23816-2
Volatile Organic Compounds																		
Benzene	mg/kg	330[A]	0.5[B]	ND (0.340) (0.0005)	-	ND (0.005) (0.0005)	***2.500 J[B]*** (0.0005)	***4.500[B]*** (0.0005)	***130.000[B]*** (0.0005)	***27.000[B]*** (0.0005)	***3.700[B]*** (0.0005)	ND (0.210) (0.0005)	***96.000[B]*** (0.0005)	0.002 J (0.0005)	***0.700 J[B]*** (0.0005)	***1.300[B]*** (0.0005)	ND (0.0017) (0.00020)	0.136 (0.0071)
Cyclohexane	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	*ND (0.340)* (0.001)	-	ND (0.005) (0.001)	*ND (5.300)* (0.001)	*ND (0.280)* (0.001)	*ND (4.300)* (0.001)	*ND (2.000)* (0.001)	*ND (0.770)* (0.001)	*ND (0.210)* (0.001)	*ND (4.700)* (0.001)	ND (0.004) (0.001)	*ND (4.200)* (0.001)	*ND (0.240)* (0.001)	ND (0.0017) (0.00021)	*ND (0.059)* (0.0075)
1,2-Dichloroethane (EDC)	mg/kg	98[A]	0.5[B]	ND (0.340) (0.001)	-	ND (0.005) (0.001)	*ND (5.300)* (0.001)	ND (0.280) (0.001)	*ND (4.300)* (0.001)	*ND (2.000)* (0.001)	*ND (0.770)* (0.001)	ND (0.210) (0.001)	*ND (4.700)* (0.001)	ND (0.004) (0.001)	*ND (4.200)* (0.001)	ND (0.240) (0.001)	ND (0.0017) (0.00023)	ND (0.059) (0.0080)
Ethylbenzene	mg/kg	1000[A]	70[B]	ND (0.340) (0.001)	-	ND (0.005) (0.001)	ND (5.300) (0.001)	0.810 (0.001)	ND (4.300) (0.001)	2.900 (0.001)	3.600 (0.001)	ND (0.210) (0.001)	1.200 J (0.001)	ND (0.004) (0.001)	ND (4.200) (0.001)	0.130 J (0.001)	ND (0.0017) (0.00044)	0.309 (0.016)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	0.440 (0.001)	-	ND (0.005) (0.001)	360.000 (0.001)	10.000 (0.001)	710.000 (0.001)	180.000 (0.001)	110.000 (0.001)	0.130 J (0.001)	360.000 (0.001)	0.083 (0.001)	180.000 (0.001)	0.230 J (0.001)	ND (0.0085) (0.00013)	7.21 (0.0044)
Methyl Tertiary Butyl Ether	mg/kg	9900[A]	2[B]	ND (0.340) (0.0005)	-	ND (0.005) (0.0005)	*ND (5.300)* (0.0005)	ND (0.280) (0.0005)	*ND (4.300)* (0.0005)	ND (2.000) (0.0005)	ND (0.770) (0.0005)	ND (0.210) (0.0005)	*ND (4.700)* (0.0005)	ND (0.004) (0.0005)	*ND (4.200)* (0.0005)	ND (0.240) (0.0005)	ND (0.0017) (0.00040)	ND (0.059) (0.014)
Hexane	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene, Sec-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene, Tert-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	10000[A]	100[B]	0.190 J (0.001)	-	ND (0.005) (0.001)	3.900 J (0.001)	1.200 (0.001)	20.000 (0.001)	22.000 (0.001)	45.000 (0.001)	ND (0.210) (0.001)	81.000 (0.001)	ND (0.004) (0.001)	ND (4.200) (0.001)	0.320 (0.001)	ND (0.0017) (0.00018)	0.163 (0.0062)
1,2,4-Trimethylbenzene	mg/kg	640[A]	35[B]	0.140 J (0.001)	-	ND (0.005) (0.001)	10.000 (0.001)	1.000 (0.001)	ND (4.300) (0.001)	0.960 J (0.001)	0.700 J (0.001)	ND (0.210) (0.001)	ND (4.700) (0.001)	ND (0.004) (0.001)	ND (4.200) (0.001)	0.088 J (0.001)	ND (0.0085) (0.00035)	0.481 (0.012)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.340) (0.001)	-	ND (0.005) (0.001)	9.300 (0.001)	0.480 (0.001)	ND (4.300) (0.001)	0.440 J (0.001)	0.370 J (0.001)	ND (0.210) (0.001)	ND (4.700) (0.001)	ND (0.004) (0.001)	ND (4.200) (0.001)	0.081 J (0.001)	ND (0.0085) (0.00027)	0.155 J (0.0095)
Xylenes, Total (Dimethylbenzene)	mg/kg	9100[A]	1000[B]	0.160 J (0.001)	-	ND (0.005) (0.001)	3.300 J (0.001)	1.500 (0.001)	2.900 J (0.001)	12.000 (0.001)	17.000 (0.001)	ND (0.210) (0.001)	3.800 J (0.001)	ND (0.004) (0.001)	ND (4.200) (0.001)	0.560 (0.001)	ND (0.0017) (0.00024)	1.30 (0.0083)
Volatile Organic Compounds (SW8011)																		
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																		
Acenaphthene	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	190000[A]	350[B]	-	3.400 (0.003)	0.050 (0.003)	3.400 (0.003)	2.200 (0.003)	0.160 (0.003)	0.014 J (0.003)	0.004 J (0.003)	0.006 J (0.003)	ND (0.092) (0.003)	0.004 J (0.003)	0.036 (0.003)	0.290 (0.003)	0.110 (0.015)	1.26 (0.013)
Benzo(a)Anthracene	mg/kg	190000[A]	430[B]	-	3.300 (0.003)	0.130 (0.003)	2.300 (0.003)	2.800 (0.003)	0.079 (0.003)	0.014 J (0.003)	0.014 J (0.003)	0.026 (0.003)	0.050 J (0.003)	0.015 J (0.003)	0.086 (0.003)	0.900 (0.003)	0.0939 (0.014)	2.36 (0.012)
Benzo(a)Pyrene	mg/kg	190000[A]	46[B]	-	3.300 (0.003)	0.140 (0.003)	1.700 (0.003)	2.600 (0.003)	0.079 (0.003)	0.012 J (0.003)	0.013 J (0.003)	0.028 (0.003)	0.039 J (0.003)	0.02 (0.003)	0.088 (0.003)	1.500 (0.003)	0.0956 (0.013)	2.07 (0.011)
Benzo(b)Fluoranthene	mg/kg	190000[A]	170[B]	-	3.600 (0.003)	0.200 (0.003)	1.700 (0.003)	3.500 (0.003)	0.180 (0.003)	0.019 (0.003)	0.021 (0.003)	0.032 (0.003)	0.084 J (0.003)	0.022 (0.003)	0.120 (0.003)	1.900 (0.003)	0.0998 (0.014)	2.42 (0.012)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	3.500 (0.003)	0.110 (0.003)	1.000 (0.003)	1.700 (0.003)	0.073 (0.003)	0.008 J (0.003)	0.016 J (0.003)	0.029 (0.003)	0.042 J (0.003)	0.024 (0.003)	0.083 (0.003)	1.400 (0.003)	0.0802 (0.016)	1.26 (0.014)
Benzo(k)Fluoranthene	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-Biphenyl	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl) Phthalate	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-Butyl Phthalate	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	190000[A]	230[B]	-	3.700 (0.003)	0.140 (0.003)	4.000 (0.003)	3.300 (0.003)	0.094 (0.003)	0.020 (0.003)	0.018 J (0.003)	0.032 (0.003)	0.095 (0.003)	0.020 (0.003)	0.100 (0.003)	1.100 (0.003)	0.113 (0.014)	2.25 (0.013)
Dibenz(A,H)Anthracene	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl Phthalate	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	190000[A]	3800[B]	-	6.300 (0.003)	0.019 J (0.003)	6.300 (0.003)	8.400 (0.003)	0.034 (0.003)	0.047 (0.003)	0.008 J (0.003)	ND (0.018) (0.003)	0.033 J (0.003)	ND (0.019) (0.003)	0.010 J (0.003)	0.090 J (0.003)	0.126 (0.014)	0.865 (0.012)
Indeno(1,2,3-c,d)Pyrene	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol, o- (2-Methylphenol)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresol, p- (4-Methylphenol)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	190000[A]	25[B]	-	18.000 (0.003)	0.045 (0.003)	7.800 (0.003)	4.800 (0.003)	2.400 (0.003)	0.062 (0.003)	0.029 (0.003)	0.014 J (0.003)	0.160 (0.003)	ND (0.019) (0.003)	0.018 J (0.003)	0.420 (0.003)	0.0250 J (0.011)	0.226 (0.010)
4-Nitrophenol	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	190000[A]	10000[B]	-	17.000 (0.003)	0.160 (0.003)	13.000 (0.003)	10.000 (0.003)	3.300 (0.003)	0.059 (0.003)	0.013 J (0.003)	0.011 J (0.003)	0.120 (0.003)	0.014 J (0.003)	0.077 (0.003)	0.580 (0.003)	0.314 (0.019)	5.20 (0.067)
Phenol	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	190000[A]	2200[B]	-	4.200 (0.003)	0.210 (0.003)	6.200 (0.003)	5.800 (0.003)	0.140 (0.003)	0.033 (0.003)	0.025 (0.003)	0.042 (0.003)	0.120 (0.003)	0.026 (0.003)	0.160 (0.003)	0.900 (0.003)	0.301 (0.016)	4.87 (0.057)
Pyridine	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quinoline	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																		
Cobalt	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	190000[A]	450[B]	256 (0.510)	-	101 (0.510)	90.6 (0.510)	137 (0.510)	34.3 (0.510)	6.19 (0.510)	10.6 (0.510)	9.85 (0.510)	15.3 (0.510)	10.9 (0.510)	18.9 (0.510)	***1720[B]*** (0.510)	***1020[B]*** (0.16)	204 (0.13)
Nickel	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																		
Moisture, Percent	%	n/v	n/v	32.5 (0.50)	32.3 (0.50)	10.9 (0.50)	15.0 (0.50)	10.5 (0.50)	11.6 (0.50)	8.6 (0.50)	9.0 (0.50)	5.7 (0.50)	8.9 (0.50)	9.4 (0.50)	8.0 (0.50)	9.3 (0.50)	-	-
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	8.84 (0.0100)	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	67.2 ()	85.8 ()

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016. Medium-Specific
[A]	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Subsurface Soil (2-15 ft).
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016.
[B]	PADEP Non-Residential Statewide Health Standards (>2 ft bgs) (Unsaturated Soil).
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram.
ft	Feet.
	Method detection limit is shown in second set of parentheses.

Table 4b

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B-172		B-173		B-174		B-175		GP768-1	GP768-2	GP768-3	GP768-4	GP768-5	GP768-6
Sample Date				6-Apr-16	12-Jul-16	5-Apr-16	13-Jul-16	4-Apr-16	13-Jul-16	5-Apr-16	13-Jul-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16
Sample ID				AOI6-B-172-2-4-SOIL	AOI6-B-172-2-4-071216	AOI6-B-173-2-4-SOIL	AOI6-B-173-2-4-071316	AOI6-B-174-2-4-SOIL	AOI6-B-174-2-4-071316	AOI6-B-175-2-4-SOIL	AOI6-B-175-2-4-071316	GP768-1-(3')-20160428	GP768-2-(3')-20160428	GP768-3-(3')-20160428	GP768-4-(2')-20160428	GP768-5-(2')-20160428	GP768-6-(2')-20160428
Sample Depth				2.5 - 3 ft	2.5 - 3 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	2.7 - 3 ft	2.7 - 3 ft	3 ft	3 ft	3 ft	2 ft	2 ft	2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1647893	1682991	1647893	1682991	1647893	1682991	1647893	1682991	1655907	1655907	1655907	1655907	1655907	1655907
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8321195	8475493	8321187	8475495	8321183	8475497	8321189	8475499	8358315	8358316	8358317	8358318	8358319	8358320
Volatile Organic Compounds																	
Benzene	mg/kg	330[A]	0.5[B]	ND (0.410) (0.0005)	-	0.054 J (0.0005)	-	0.005 (0.0005)	-	0.210 J (0.0005)	-	0.0006 J (0.0005)	0.0008 J (0.0005)	0.001 J (0.0005)	ND (0.29) (0.0005)	0.005 (0.0005)	ND (0.0005) (0.0005)
Cyclohexane	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.58) (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	*ND (0.41)* (0.001)	-	*ND (0.330)* (0.001)	-	ND (0.005) (0.001)	-	*ND (0.340)* (0.001)	-	-	-	-	-	-	-
1,2-Dichloroethane (EDC)	mg/kg	98[A]	0.5[B]	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	ND (0.340) (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	*ND (0.58)* (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Ethylbenzene	mg/kg	1000[A]	70[B]	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	0.230 J (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.72 J (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Isopropylbenzene (Cumene)	mg/kg	10000[A]	2500[B]	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	0.580 (0.001)	-	ND (0.0009) (0.001)	0.004 J (0.001)	0.001 J (0.001)	70 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Methyl Tertiary Butyl Ether	mg/kg	9900[A]	2[B]	ND (0.410) (0.0005)	-	ND (0.330) (0.0005)	-	ND (0.005) (0.0005)	-	ND (0.340) (0.0005)	-	ND (0.0004) (0.0005)	ND (0.0006) (0.0005)	ND (0.0005) (0.0005)	ND (0.29) (0.0005)	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)
Hexane	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.58) (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Naphthalene	mg/kg	190000[A]	25[B]	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	3.4 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Butylbenzene, Sec-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	1.8 J (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Butylbenzene, Tert-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.58) (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Toluene	mg/kg	10000[A]	100[B]	0.410 (0.001)	-	0.380 (0.001)	-	0.001 J (0.001)	-	0.500 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	0.001 J (0.001)	1.7 J (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
1,2,4-Trimethylbenzene	mg/kg	640[A]	35[B]	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	0.880 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	19 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
1,3,5-Trimethylbenzene	mg/kg	10000[A]	210[B]	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	1.500 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	15 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Xylenes, Total (Dimethylbenzene)	mg/kg	9100[A]	1000[B]	0.091 J (0.001)	-	0.074 J (0.001)	-	ND (0.005) (0.001)	-	2.200 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	16 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Volatile Organic Compounds (SW8011)																	
1,2-Dibromoethane (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	ND (0.00021) (0.00020)	ND (0.00021) (0.00020)	ND (0.00023) (0.00020)	ND (0.00020) (0.00020)	ND (0.00023) (0.00020)	ND (0.00021) (0.00020)
Semi-Volatile Organic Compounds																	
Acenaphthene	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	ND (0.0034) (0.0033)	0.0056 J (0.0033)	0.0050 J (0.0033)	1.5 (0.0033)	ND (0.0038) (0.0033)	ND (0.0035) (0.0033)
Anthracene	mg/kg	190000[A]	350[B]	-	0.270 (0.003)	-	0.190 J (0.003)	-	0.140 J (0.003)	-	4.300 (0.003)	0.0059 J (0.0033)	0.021 (0.0033)	0.029 (0.0033)	0.90 (0.0033)	0.016 J (0.0033)	ND (0.0035) (0.0033)
Benzo(a)Anthracene	mg/kg	190000[A]	430[B]	-	0.480 (0.003)	-	0.450 (0.003)	-	0.630 (0.003)	-	5.600 (0.003)	0.024 (0.0033)	0.073 (0.0033)	0.058 (0.0033)	0.41 (0.0033)	0.029 (0.0033)	0.016 J (0.0033)
Benzo(a)Pyrene	mg/kg	190000[A]	46[B]	-	0.360 (0.003)	-	0.450 (0.003)	-	0.520 (0.003)	-	4.400 (0.003)	0.026 (0.0033)	0.12 (0.0033)	0.079 (0.0033)	0.33 (0.0033)	0.050 (0.0033)	0.021 (0.0033)
Benzo(b)Fluoranthene	mg/kg	190000[A]	170[B]	-	0.500 (0.003)	-	0.630 (0.003)	-	0.650 (0.003)	-	7.700 (0.003)	0.037 (0.0033)	0.14 (0.0033)	0.15 (0.0033)	0.31 (0.0033)	0.062 (0.0033)	0.025 (0.0033)
Benzo(g,h,i)Perylene	mg/kg	190000[A]	180[B]	-	0.230 (0.003)	-	0.470 (0.003)	-	0.400 (0.003)	-	3.300 (0.003)	0.024 (0.0033)	0.11 (0.0033)	0.12 (0.0033)	0.21 (0.0033)	0.059 (0.0033)	0.020 (0.0033)
Benzo(k)Fluoranthene	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	0.019 (0.0033)	0.056 (0.0033)	0.037 (0.0033)	0.083 J (0.0033)	0.021 (0.0033)	0.011 J (0.0033)
1,1'-Biphenyl	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	1.0 (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
Bis(2-Ethylhexyl) Phthalate	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
Di-n-Butyl Phthalate	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
Chrysene	mg/kg	190000[A]	230[B]	-	0.510 (0.003)	-	0.650 (0.003)	-	0.670 (0.003)	-	5.600 (0.003)	0.026 (0.0033)	0.084 (0.0033)	0.067 (0.0033)	0.88 (0.0033)	0.033 (0.0033)	0.014 J (0.0033)
Dibenz(A,H)Anthracene	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	0.0087 J (0.0033)	0.029 (0.0033)	0.034 (0.0033)	0.088 J (0.0033)	0.013 J (0.0033)	0.0074 J (0.0033)
Diethyl Phthalate	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
2,4-Dimethylphenol	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
2,4-Dinitrophenol	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	ND (0.31) (0.30)	ND (0.33) (0.30)	ND (0.36) (0.30)	ND (1.6) (0.30)	ND (0.34) (0.30)	ND (0.32) (0.30)
Fluoranthene	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	0.026 (0.0033)	0.086 (0.0033)	0.060 (0.0033)	0.39 (0.0033)	0.029 (0.0033)	0.013 J (0.0033)
Fluorene	mg/kg	190000[A]	3800[B]	-	0.110 (0.003)	-	0.160 J (0.003)	-	0.041 J (0.003)	-	8.400 (0.003)	ND (0.0034) (0.0033)	0.0056 J (0.0033)	0.0069 J (0.0033)	2.0 (0.0033)	0.0061 J (0.0033)	ND (0.0035) (0.0033)
Indeno(1,2,3-c,d)Pyrene	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	0.020 (0.0033)	0.085 (0.0033)	0.097 (0.0033)	0.16 (0.0033)	0.043 (0.0033)	0.014 J (0.0033)
2-Methylnaphthalene	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	0.0049 J (0.0033)	0.022 (0.0033)	0.045 (0.0033)	13 (0.0033)	0.018 J (0.0033)	0.0046 J (0.0033)
Cresol, o- (2-Methylphenol)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
Cresol, p- (4-Methylphenol)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
Naphthalene	mg/kg	190000[A]	25[B]	-	0.120 (0.003)	-	1.200 (0.003)	-	0.140 J (0.003)	-	3.900 (0.003)	-	-	-	-	-	-
4-Nitrophenol	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	ND (0.17) (0.17)	ND (0.18) (0.17)	ND (0.20) (0.17)	ND (0.87) (0.17)	ND (0.19) (0.17)	ND (0.18) (0.17)
Phenanthrene	mg/kg	190000[A]	10000[B]	-	0.790 (0.003)	-	0.880 (0.003)	-	0.530 (0.003)	-	22.000 (0.003)	0.0095 J (0.0033)	0.032 (0.0033)	0.049 (0.0033)	4.3 (0.0033)	0.020 (0.0033)	0.0060 J (0.0033)
Phenol	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
Pyrene	mg/kg	190000[A]	2200[B]	-	0.780 (0.003)	-	0.810 (0.003)	-	1.000 (0.003)	-	6.300 (0.003)	0.025 (0.0033)	0.10 (0.0033)	0.060 (0.0033)	1.4 (0.0033)	0.035 (0.0033)	0.015 J (0.0033)
Pyridine	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
Quinoline	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	ND (0.034) (0.033)	ND (0.037) (0.033)	ND (0.040) (0.033)	ND (0.17) (0.033)	ND (0.038) (0.033)	ND (0.036) (0.033)
Metals																	
Cobalt	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	4.34 (0.0810)	6.41 (0.0810)	9.74 (0.0810)	4.11 (0.0810)	6.66 (0.0810)	3.67 (0.0810)
Lead	mg/kg	190000[A]	450[B]	208 (0.510)	-	315 (0.510)	-	***1360[B]*** (0.510)	-	255 (0.510)	-	18.6 (0.510)	86.3 (0.510)	91.7 (0.510)	39.5 (0.510)	27.8 (0.510)	10.8 (0.510)
Nickel	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	43.1 (0.300)	45.3 (0.300)	149 (0.300)	43.7 (0.300)	15.2 (0.300)	26.9 (0.300)
Vanadium	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	149 (0.230)	214 (0.230)	321 (0.230)	169 (0.230)	144 (0.230)	34.6 (0.230)
Zinc	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	62.5 (0.770)	134 (0.770)	157 (0.770)	307 (0.770)	60.0 (0.770)	25.2 (0.770)
General Chemistry																	
Moisture, Percent	%	n/v	n/v	42.4 (0.50)	16.7 (0.50)	34.3 (0.50)	14.4 (0.50)	24.2 (0.50)	15.1 (0.50)	37.5 (0.50)	29.6 (0.50)	4.0 (0.50)	9.2 (0.50)	18.1 (0.50)	4.1 (0.50)	13.0 (0.50)	7.3 (0.50)
pH, Laboratory Measured	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Percent	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016. Medium-Specific
[A]	Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Subsurface Soil (2-15 ft).
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016.
[B]	PADEP Non-Residential Statewide Health Standards (>2 ft bgs) (Unsaturated Soil).
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (2.4) (1.2	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram.
ft	Feet.
	Method detection limit is shown in second set of parentheses.

Table 5

Summary of PADEP Open Storage Tank Incidents AOI 6
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Release/ Incident Date	PADEP Incident Number	Sun Tank Number	DEP Tank Number	Current PADEP Tank Number (PES)	Quantity Released (gallon)	Product Description	Regulatory Program
9/12/1993	45692	81	121A	NA	100	Caustic Release	PADEP Chapter 245 Storage Tank Program
7/19/1998	4844	676	130A	045A	2600	#6 Fuel Oil	PADEP Chapter 245 Storage Tank Program
6/10/2002	29122	797	097A	NA	5	Benzene	PADEP Chapter 245 Storage Tank Program

Note:

1 NA indicated information not applicable or not available

2 PADEP Release Incident Number 37546 for Tank 250 was originally listed as on open incident by the PADEP in their 2014 summary of open incidents but was changed to closed in accordance with Mr. David Brown's Technical Review Memo dated August 29, 2017.

Table 6

Existing Well Summary
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Former Well ID[2]	Well Status	Disposition of Well	Northing[3]	Easting[3]	Well Type[4]	Well Classification/ Hydrostratigraphic Unit[5]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction Details[1]							
												Well Completion Depth (ft/bgs)[6]	Well Diameter (in)[7]	Top of Inner Casing Elevation (ft msl) (NAVD88)[8]	Ground Surface Elevation (ft msl) (NAVD88)[8]	Top of Screen Elev (ft msl) (NAVD88)[8]	Bottom of Screen Elevation (ft msl) (NAVD88)[8]	Depth to Screen (ft bgs)[8]	Screen Length (ft)[9]
AOI 6	B-115				218058.703	2682824.9	MW	Shallow						7.5	4.88				
AOI 6	B-116				217899.153	2682925	MW	Shallow						5.07	6.33				
AOI 6	B-117				217678.393	2682499.4	MW	Shallow						5.97	8.89				
AOI 6	B-123				217145.729	2681457.9	MW	Shallow						10.76	7.61				
AOI 6	B-124				216810.937	2681316.4	RW	Shallow	Y	Y	9/21/1992	15	4	8.97	5.91	0.91	-9.09	5	10
AOI 6	B-125				216828.873	2681099.2	MW	Shallow						8.51	5.25				
AOI 6	B-126				217022.175	2680973.6	MW	Shallow						8.51	5.52				
AOI 6	B-129				217874.097	2683017.7	MW	Shallow	Y	Y	8/20/1992	15	4	8.02	6.33	1.33	-8.67	5	10
AOI 6	B-130				217397.337	2680131.2	MW	Shallow	Y	Y	8/20/1992	16	4	9.69	8.11	3.11	-6.89	5	10
AOI 6	B-131				216460.204	2680692.6	MW	Shallow	Y	Y	8/20/1992	14	4	8.72	6.2	2.2	-7.8	4	10
AOI 6	B-132				217350.988	2681170.9	MW	Shallow	Y	Y	8/28/2001	11	4	6.87	2.27	1.27	-8.73	1	10
AOI 6	B-133				217307.146	2681206.8	RW	Shallow	Y	Y	8/28/2001	11		7.33	3.3	2.3	-7.7	1	10
AOI 6	B-134				217285.225	2681162.9	RW	Shallow	Y	Y	8/28/2001	11		6.52	3.38	2.38	-7.62	1	10
AOI 6	B-135				217329.067	2681137	MW	Shallow	Y	Y	8/28/2001	11		6.38	3.31	2.31	-7.69	1	10
AOI 6	B-136				217259.319	2681252.6	RW	Shallow	Y	Y	8/29/2001	12		9.15	6.31	4.31	-5.69	2	10
AOI 6	B-137				217187.578	2681298.4	RW	Shallow	Y	Y	8/29/2001	12		8.73	6.22	4.22	-5.78	2	10
AOI 6	B-138				217137.758	2681330.3	RW	Shallow	Y	Y	8/29/2001	12		9.33	6.06	4.06	-5.94	2	10
AOI 6	B-139		Damaged	Casing damaged	217339.031	2681270.5	RW	Shallow	Y	Y	8/29/2001	12		9.4	6.93	4.93	-5.07	2	10
AOI 6	B-140		Destroyed		217269.283	2681316.4	RW	Shallow	Y	Y	8/29/2001	12		10.14	7.39	5.39	-4.61	2	10
AOI 6	B-141		Damaged	new riser required	217229.427	2681380.2	MW	Shallow	Y	Y	8/30/2001	12		8.69	7.75	5.75	-4.25	2	10
AOI 6	B-142				217177.614	2681208.8	RW	Shallow	Y	Y	8/29/2001	12		9.74	6.81	4.81	-5.19	2	10
AOI 6	B-143				217207.506	2681159	RW	Shallow	Y	Y	8/29/2001	12		8.98	6.36	4.36	-5.64	2	10
AOI 6	B-144				217133.772	2681234.7	MW	Shallow	Y	Y	8/30/2001	12		9.02	6.16	4.16	-5.84	2	10
AOI 6	B-145				217085.945	2681362.2	MW	Shallow	Y	Y	8/30/2001	12		9.81	7.16	5.16	-4.84	2	10
AOI 6	B-146		Unable to Locate		217211.491	2681455.9	MW	Shallow	Y	Y	8/30/2001	12		7.77	7.8	5.8	-4.2	2	10
AOI 6	B-147				217145.729	2681125.1	RW	Shallow	Y	Y	8/30/2001	12		8.9	6.6	4.6	-5.4	2	10
AOI 6	B-148	MW-1			217443.977	2681076.9	MW	Shallow	Y	N	9/17/2002	11		7.22	5.19	4.19	-5.81	1	10
AOI 6	B-149	MW-2			217436.203	2680999.2	MW	Shallow	Y	Y	9/17/2002	11		7.74	5.8	4.8	-5.2	1	10
AOI 6	B-150	MW-3			217480.252	2680965.5	MW	Shallow	Y	Y	9/16/2002	11		7.8	5.83	4.83	-5.17	1	10
AOI 6	B-151				217738.379	2680728.9	MW	Shallow	Y	Y	2/23/2006	13	4	7.735	5.77	3.77	-4.23	2	8
AOI 6	B-152				217848.398	2680602.5	MW	Shallow	Y	Y	2/27/2006	10	4	5.036	5.5	3.5	-4.5	2	8
AOI 6	B-153				217475.27	2680101.7	MW	Shallow	Y	Y	2/24/2006	10	4	6.367	6.67	4.67	-3.33	2	8
AOI 6	B-154				217552.437	2680926.8	MW	Shallow	Y	Y	2/23/2006	13	4	8.68	6.43	4.43	-3.57	2	8
AOI 6	B-155				217399.88	2680974.7	MW	Shallow	Y	Y	2/24/2006	13	4	8.541	6.54	4.54	-3.46	2	8
AOI 6	B-156				217365.5	2680904.1	MW	Shallow	Y	Y	2/23/2006	13	4	8.856	6.65	4.65	-3.35	2	8
AOI 6	B-157		Unable to Locate		217194.811	2680880.6	MW	Shallow	Y	Y	2/22/2006	12	4	4.924	5.26	3.26	-6.74	2	10
AOI 6	B-158				217966.981	2679968.9	MW	Shallow	Y	Y	2/22/2006	12	4	8.209	8.66	6.66	-3.34	2	10
AOI 6	B-159		Destroyed		217268.172	2681614.1	MW	Shallow	Y	Y	4/20/2006	10	4	6.1924	8.51	3.9193	-1.49	5	8
AOI 6	B-160				217370.65	2681839.8	MW	Shallow	Y	Y	2/27/2006	10	4	8.532	8.95	6.95	-1.05	2	8
AOI 6	B-161				216894.044	2681270.4	MW	Shallow	Y	Y	2/21/2006	15	4	8.3	6.98	4.98	-5.02	2	10
AOI 6	B-162				217903.199	2682803.5	MW	Shallow	Y	Y	2/20/2006	18	4	7.589	4.93	2.93	-10.07	2	13
AOI 6	B-163				217531.251	2681198.8	MW	Shallow	Y	Y	2/28/2006	10	4	7.452	7.68	5.68	-2.32	2	8

Table 6

Existing Well Summary
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Former Well ID[2]	Well Status	Disposition of Well	Northing[3]	Easting[3]	Well Type[4]	Well Classification/ Hydrostratigraphic Unit[5]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction Details[1]							
												Well Completion Depth (ft/bgs)[6]	Well Diameter (in)[7]	Top of Inner Casing Elevation (ft msl) (NAVD88)[8]	Ground Surface Elevation (ft msl) (NAVD88)[8]	Top of Screen Elev (ft msl) (NAVD88)[8]	Bottom of Screen Elevation (ft msl) (NAVD88)[8]	Depth to Screen (ft bgs)[8]	Screen Length (ft)[9]
AOI 6	B-164				216480.287	2680585.2	MW	Shallow	Y	Y	2/21/2006	15	4	8.822	5.86	3.86	-6.14	2	10
AOI 6	B-165				217152.414	2680186.5	MW	Shallow	N	N	12/31/1999			5.79	6.07				
AOI 6	B-166			Shallow	217408.526	2682932.2	MW	Shallow	N	N	12/31/1999			7.47	7.89				
AOI 6	B-167			Shallow	217814.189	2683187.9	MW	Shallow	N	N	12/31/1999			6.73	7.21				
AOI 6	B-168				217494.926	2680069.6	MW	Shallow	N	N	12/31/1999			6.46	6.77				
AOI 6	B-169				217416.456	2680092.2	MW	Shallow	N	N	12/31/1999			6.12	6.47				
AOI 6	B-170			Shallow	217350.272	2680110.6	MW	Shallow	N	N	12/31/1999			0.04	0.15				
AOI 6	B-171		Reserved				MW												
AOI 6	B-172				217412.384	2680736.1	MW	Shallow	Y	Y	4/7/2016	10	4	8.01	5.15	3.15	-4.85	2	8
AOI 6	B-173				216650.661	2681020.8	MW	Shallow	Y	Y	4/6/2016	12	4	8.18	5.7	3.7	-6.3	2	10
AOI 6	B-174				216387.568	2681059.3	MW	Shallow	Y	Y	4/8/2016	12	4	8.3	5.5	3.5	-6.5	2	10
AOI 6	B-175				216862.933	2681336.1	MW	Shallow	Y	Y	4/7/2016	12	4	8.77	5.9	3.9	-6.1	2	10
AOI 6	B-39				216614.006	2680589.9	MW	Shallow	Y	Y	2/19/1986	15	4	5.48	5.54	2.54	-9.46	3	12
AOI 6	B-40		Destroyed		216938.477	2680955.7	MW	Shallow	Y	Y	2/18/1986	13	4	7.17	6.12	3.12	-6.88	3	10
AOI 6	B-41		Destroyed		217614.988	2680836	MW	Shallow	Y	Y	2/21/1986	12	4	8.85	7.8	5.8	-4.2	2	10
AOI 6	B-42		Destroyed		217060.496	2680219.3	MW	Shallow	Y	Y	2/19/1986	15	4	8.04	6.99	4.49	-8.01	3	12.5
AOI 6	B-43				217573.531	2680040.5	MW	Shallow	Y	Y	2/19/1986	14.5	4	7.21	7.14	4.14	-7.36	3	11.5
AOI 6	B-44		Destroyed		217973.28	2680563.8	MW	Shallow	Y	Y	2/20/1986	15	4	8.21	7.16	4.16	-5.84	3	10
AOI 6	B-45				218353.448	2680392.9	MW	Shallow	Y	Y	2/20/1986	15	4	5.099	4.9	1.9	-10.1	3	12
AOI 6	B-46				218130.615	2681908.7	MW	Shallow	Y	Y	2/21/1986	12	4	8.03	8.32	6.32	-3.68	2	10
AOI 6	B-47				217433.612	2681963.1	MW	Shallow	Y	Y	2/21/1986	13	4	8.3	8	5	-5	3	10
AOI 6	B-48				217529.482	2682248.1	MW	Shallow	Y	Y	2/21/1986	14	4	6.5	6.8	2.8	-7.2	4	10
AOI 6	B-92				216966.376	2681497.7	MW	Shallow	Y	Y	10/21/1986	15.5	4	10.23	7.3	1.8	-8.2	6	10
AOI 6	B-93		Destroyed		217477.661	2681561.5	MW	Shallow	Y	Y	10/22/1986	13.5	4	12.83	11.67	8.17	-1.83	4	10
AOI 6	B-94				217609.806	2683136.9	MW	Shallow	Y	Y	10/22/1986	14	4	10.35	7.21	3.21	-6.79	4	10
AOI 6	B-95	GP U 677-MW			217541.104	2680372.6	MW	Shallow						8.867	6.608				
AOI 6	GP-19		Destroyed				MW	Shallow	Y	Y	9/11/2000	15		7.8				5	10
AOI 6	GP-22		Destroyed				MW	Shallow	Y	Y	9/11/2000	15		7.5				10	5
AOI 6	GP-3		Destroyed				MW	Shallow	Y	Y	9/8/2000	14		7.6				4	9
AOI 6	PH-36		Destroyed				MW												
AOI 6	PH-37		Destroyed				MW												
AOI 6	PH-39		Destroyed				MW												
AOI 6	PH-42		Destroyed				MW												
AOI 6	PS-1		Destroyed		217224.428	2681226.9	MW		N	N				9.02					
AOI 6	PZ-132A				216103.54	2680865.9	Piezometer	Shallow	Y	Y	3/8/2001	10	1	10.15	8.12	3.12	-1.88	5	5
AOI 6	PZ-132B		Destroyed				Piezometer	Shallow	Y	Y	3/8/2001	10	1					5	5
AOI 6	PZ-134A		Destroyed				Piezometer	Shallow	Y	Y	3/8/2001	10	1					5	5
AOI 6	PZ-134B		Destroyed				Piezometer	Shallow	Y	Y	3/8/2001	10	1					5	5
AOI 6	PZ-135A				216284.976	2680664	Piezometer	Shallow	Y	Y	3/8/2001	10	1	10.18	8.57	3.57	-1.43	5	5
AOI 6	PZ-135B				216290.237	2680656.2	Piezometer	Shallow	Y	Y	3/8/2001	10	1	10.21				5	5
AOI 6	RW-9				216561.837	2681445.9	RW	Shallow	Y	Y				8.76	5.88				
AOI 6	SUMP-1				217217.47	2681190.8	RW	Shallow	Y	Y	11/1/2001	10	6	10.7				0	10
AOI 6	U-1				216621.098	2681638.4	MW	Shallow	N	N				10.7	7.22				
AOI 6	U-2				216693.553	2681797.9	MW	Shallow	N	N				9.39	7.13				
AOI 6	U-3				216811.345	2681941	MW	Shallow	N	N				9.8	6.84				

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												Well Completion Depth (ft/bgs)[6]	Well Diameter (in)[7]	Top of Inner Casing Elevation (ft msl) (NAVD88)[8]	Ground Surface Elevation (ft msl) (NAVD88)[8]	Top of Screen Elev (ft msl) (NAVD88)[8]	Bottom of Screen Elevation (ft msl) (NAVD88)[8]	Depth to Screen (ft bgs)[8]	Screen Length (ft)[9]
AOI 6	U-4				216875.006	2682042.6	MW	Shallow	N	N				9.22	6.64				
AOI 6	U-5				216800.942	2681801.5	MW	Shallow	N	N				9.79	7.6				
AOI 6	URS-1	B-132U			216100.512	2680858.7	MW	Shallow	N	N				10.02					
AOI 6	URS-2	B-133U	Unable to Locate		216725.578	2681726.7	MW	Shallow	N	N				7.89					
AOI 6	URS-3	B-134U			216761.463	2681038.8	MW	Shallow	N	N		18		7.6					
AOI 6	URS-4	B-135U			216277.495	2680670.6	MW	Shallow	N	N				9.941					
AOI 6	URS-5	B-136U			216793.509	2680400.6	MW	Shallow	N	N		14		7.94					
AOI 6	WP10-1		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP10-2		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-1		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-10		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-11		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-12		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-2		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-3		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-4		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-5		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-6		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-7		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-8		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP11-9		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP12-1		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP12-2		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP12-3		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP12-4		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP12-5		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10

Table 6

Existing Well Summary
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Former Well ID[2]	Well Status	Disposition of Well	Northing[3]	Easting[3]	Well Type[4]	Well Classification/ Hydrostratigraphic Unit[5]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction Details[1]							
												Well Completion Depth (ft/bgs)[6]	Well Diameter (in)[7]	Top of Inner Casing Elevation (ft msl) (NAVD88)[8]	Ground Surface Elevation (ft msl) (NAVD88)[8]	Top of Screen Elev (ft msl) (NAVD88)[8]	Bottom of Screen Elevation (ft msl) (NAVD88)[8]	Depth to Screen (ft bgs)[8]	Screen Length (ft)[9]
AOI 6	WP16-1		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP16-2				216956.412	2682316.8	MW								13.59				
AOI 6	WP16-2		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5			13.59	13.09	3.09	1	10
AOI 6	WP16-3		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP16-4		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP16-5		Destroyed		216990.29	2682366.6	Temporary Well Point	Shallow	Y	Y	6/21/1993	10.5	2	13.57				1	10
AOI 6	WP17-1		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP17-2		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP17-3		Destroyed				Temporary Well Point		Y	Y	6/11/1993	10.5						1	10
AOI 6	WP8-1		Destroyed				Temporary Well Point		Y	Y	5/25/1993	10.5						1	10
AOI 6	WP8-2		Destroyed				Temporary Well Point		Y	Y	5/25/1993	10.5						1	10
AOI 6	WP8-3		Destroyed				Temporary Well Point		Y	Y	5/25/1993	10.5						1	10
AOI 6	WP9-1		Destroyed		216858.765	2681350.3	Temporary Well Point	Shallow	Y	Y	5/26/1993	9			7.9	7.4	-2.1	1	9.5
AOI 6	WP9-2		Unable to Locate		216787.024	2681262.6	Temporary Well Point	Shallow	Y	Y	5/26/1993	10.5		6.01				1	10
AOI 6	WP9-3		Damaged	Obstruction in well	216733.218	2681300.4	Temporary Well Point	Shallow	Y	Y	5/26/1993	9		6.16				1	9.5
AOI 6	WP9-4				216537.48	2681422.1	Temporary Well Point	Shallow	Y	Y	6/14/1993	9		9.04	5.8	5.3	-4.2	1	9.5
AOI 6	WP9-5		Destroyed		216613.65	2681159	Temporary Well Point		Y	Y	6/14/1993	10.5			-1.05	-1.55	-11.55	1	10
AOI 6	WP9-6		Destroyed		216850.79	2681081.2	Temporary Well Point		Y	Y	6/11/1993	10.5			10.02	9.52	-0.48	1	10
AOI 6	WPM-1		Destroyed		217185.58	2682396.5	Temporary Well Point								13.8				
AOI 6	WPM-10		Destroyed		217022.175	2682342.7	Temporary Well Point								9.99				
AOI 6	WPM-11				217105.984	2682370.8	Temporary Well Point	Shallow						6.509	6.858				
AOI 6	WPM-2		Repaired	Converted to Flush Mount	217072.188	2682472.1	Temporary Well Point	Shallow						7.47	7.964				
AOI 6	WPM-3				217085.439	2682433.1	Temporary Well Point	Shallow						8.031	7.964				

Table 6

Existing Well Summary
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Former Well ID[2]	Well Status	Disposition of Well	Northing[3]	Easting[3]	Well Type[4]	Well Classification/ Hydrostratigraphic Unit[5]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction Details[1]							
												Well Completion Depth (ft/bgs)[6]	Well Diameter (in)[7]	Top of Inner Casing Elevation (ft msl) (NAVD88)[8]	Ground Surface Elevation (ft msl) (NAVD88)[8]	Top of Screen Elev (ft msl) (NAVD88)[8]	Bottom of Screen Elevation (ft msl) (NAVD88)[8]	Depth to Screen (ft bgs)[8]	Screen Length (ft)[9]
AOI 6	WPM-4		Destroyed		217323.088	2682639.6	Temporary Well Point							14.06	13.01				
AOI 6	WPM-5		Destroyed				Temporary Well Point							14.18	13.13				
AOI 6	WPM-6		Destroyed		217139.75	2682446.3	Temporary Well Point							14.35	13.3				
AOI 6	WPM-7		Destroyed		217235.212	2682631	Temporary Well Point								14.68				
AOI 6	WPM-8	RWM-8	Destroyed		217025.191	2682447.5	Temporary Well Point							12.61					
AOI 6	WPM-9		Destroyed				Temporary Well Point							16.5	15.45				

Notes:

1. Well construction details were obtained from well boring logs provided by historic reports.
2. Former Well IDs were derived from handwritten notes on boring logs or as referenced in historic reports.
3. Coordinate pairs are projected in the Pennsylvania State Plane Coordinate System (feet), referenced to the North American Datum of 1983 (NAD83).
4. MW = monitoring well; RW = recovery well
5. The hydrostratigraphic unit denotes the aquifer and/or mappable water-bearing stratum in which the well is interpreted to be screened by Stantec.
   Historic wells without lithologic logs, wells without as-built information, and/or destroyed wells were not assigned hydrostratigraphic units.
6. ft bgs = feet below ground surface
7. in = inches
8. NAVD88 = North American Vertical Datum of 1988
9. ft = feet

General Note:

Stantec presently maintains an electronic database from which these well records were extracted. Many of the well records in that database were translated from historic paper records, or from electronic tables received from other consultants. Maintenance of the electronic well database, including revisions to anomalous or missing information, is ongoing and as such this table may be subject to future revision.

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-39**	**B-39**	**B-39**	**B-43**	**B-43**	**B-45**	**B-115**	**B-116**
Sample ID:		**PADEP**	**GW-11109613-B39-05-11-16-MM-043**	**GW-11109613-B-39-082416-AC-022**	**GW-11109613-B-39-082416-KC-023**	**B-43-20160523**	**GW-11109613-B-43-082216-KC-005**	**GW-11109613-B45-05-05-16-RM-014**	**GW-11109613-B115-05-04-16-AC-007**	**GW-11109613-B116-05-04-16-RM-006**
Sample Date:		**Act2**	**05/11/2016**	**08/24/2016**	**08/24/2016**	**05/23/2016**	**08/22/2016**	**05/05/2016**	**05/04/2016**	**05/04/2016**
		Used Aquifer								
Parameters	**Units**	**NR MSC**								
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	1 J	0.6 J	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(0.5)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	3	4	3	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	11	26	17	4	6	ND(2)	ND(2)	0.5 J
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	0.7 J	2	2	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L		-	-	-	ND() ND	-	-	-	-
Xylenes (total)	µg/L	10000	4	5	4	ND(0.5)	0.6 J	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds										
Anthracene	µg/L	66	5.8	1.6	0.41	0.7	0.22	0.042 J	0.065	0.27
Benzo(a)anthracene	µg/L	4.9	3.0	0.48	0.086	2	0.89	0.021 J	0.034 J	0.058
Benzo(a)pyrene	µg/L	0.2	**2.5**	**0.34**	0.071	**2**	**0.66 J**	0.030 J	ND(0.052)	0.013 J
Benzo(b)fluoranthene	µg/L	1.2	**3.1**	0.47	0.083	**2**	0.75 J	0.043 J	0.012 J	0.017 J
Benzo(g,h,i)perylene	µg/L	0.26	**1.5**	0.16	0.057	**1**	**0.32 J**	0.033 J	ND(0.052)	ND(0.050)
Chrysene	µg/L	1.9	**2.6**	0.43	0.090	**3**	1.0	0.050 J	0.035 J	0.066
Fluorene	µg/L	1900	14	5.5	3.0	0.9	0.34	0.042 J	0.13	1.5
Naphthalene	µg/L	100	8.0	4.4	ND(0.064)	ND(0.1)	ND(0.063)	ND(0.061)	ND(0.063)	0.070
Phenanthrene	µg/L	1100	25	6.0	0.86	ND(0.1)	0.24	0.065	0.40	0.054 J
Pyrene	µg/L	130	6.4	1.1	0.35	7	2.9	0.085	0.24	0.65
Metals										
Lead	µg/L	5	**16.7**	-	-	-	-	-	ND(1.0)	0.88 J
Lead (dissolved)	µg/L	5	-	2.1	4.7	ND(0.13)	2.8	0.14 J	-	-
Fumigant										
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	**0.057**	ND(0.028)	ND(0.0097)	ND(0.028)	ND(0.029)	ND(0.028)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-116**	**B-116**	**B-116**	**B-117**	**B-117**	**B-125**	**B-125**
Sample ID:		**PADEP**	**GW-11109613-B-116-082416-AC-026**	**GW-11109613-B-116-082416-AC-027**	**GW-11109613-B-116D-082416-AC-028**	**GW-11109613-B117-05-04-16-AC-008**	**GW-11109613-B-117-082216-AC-006**	**GW-11109613-B125-05-09-16-MM-032**	**GW-11109613-B-125-082316-KC-010**
Sample Date:		**Act2**	**08/24/2016**	**08/25/2016**	**08/25/2016**	**05/04/2016**	**08/22/2016**	**05/09/2016**	**08/23/2016**
		Used Aquifer			**Duplicate**				
Parameters	**Units**	**NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	2 J	0.8 J
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	3	2
Benzene	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	**9**	**9**
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	0.6 J	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	8	9
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	3	4
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	30	25
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.036 J	0.11	0.080	1.8	1.0	1.5	1.9
Benzo(a)anthracene	µg/L	4.9	0.021 J	0.045 J	0.028 J	0.46	0.25	0.45	0.16
Benzo(a)pyrene	µg/L	0.2	ND(0.050)	0.018 J	ND(0.051)	**0.34**	0.19 J	**0.23**	0.040 J
Benzo(b)fluoranthene	µg/L	1.2	ND(0.050)	0.023 J	ND(0.051)	0.42	0.23 J	0.25	0.046 J
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.050)	ND(0.051)	ND(0.051)	0.22	0.13 J	0.070	0.012 J
Chrysene	µg/L	1.9	0.031 J	0.059	0.039 J	0.54	0.34	0.34	0.13
Fluorene	µg/L	1900	0.054	1.1	0.91	0.74	0.24	4.8	6.6
Naphthalene	µg/L	100	0.031 J	ND(0.061)	ND(0.062)	0.11	ND(0.061)	0.40	0.31
Phenanthrene	µg/L	1100	ND(0.060)	ND(0.061)	ND(0.062)	0.94	1.1	1.2	3.3
Pyrene	µg/L	130	0.29	0.39	0.32	3.3	2.4	2.1	1.4
Metals									
Lead	µg/L	5	-	-	-	ND(1.0)	-	0.24 J	-
Lead (dissolved)	µg/L	5	ND(1.0)	0.14 J	0.16 J	-	0.25 J	-	ND(1.0)
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.028)	ND(0.028)	ND(0.029)	ND(0.028)	ND(0.028)	ND(0.029)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-126**	**B-126**	**B-131**	**B-132**	**B-132**	**B-133**	**B-133**
Sample ID:		**PADEP**	**GW-11109613-B126-05-10-16-MM-035**	**GW-11109613-B-126-082316-KC-008**	**GW-11109613-B131-05-05-16-RM-012**	**GW-11109613-B132-05-11-16-AC-042**	**GW-11109613-B-132-082416-AC-018**	**GW-11109613-B133-05-05-16-RM-020**	**GW-11109613-B-133D-082416-AC-029**
Sample Date:		**Act2**	**05/10/2016**	**08/23/2016**	**05/05/2016**	**05/11/2016**	**08/24/2016**	**05/05/2016**	**08/25/2016**
Parameters	**Units**	**Used Aquifer NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	8 J	5 J	ND(2)	ND(2)	ND(2)	0.7 J	ND(2)
1,2-Dichloroethane	µg/L	5	**ND(10)**	ND(5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	7 J	4 J	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	**95**	**78**	1	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	13	9	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	60	40	8	8	5	59	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(10)	ND(5)	ND(1)	ND(1)	ND(1)	1	ND(1)
Toluene	µg/L	1000	40	29	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	64	47	0.6 J	ND(1)	ND(1)	2	ND(1)
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	9.1	6.6	0.76	13	1.5	11	ND(0.050)
Benzo(a)anthracene	µg/L	4.9	0.71	0.82	0.37	**7.7**	0.88	1.7	ND(0.050)
Benzo(a)pyrene	µg/L	0.2	**0.38**	**0.39 J**	0.090	**4.4**	**0.49**	**0.72**	ND(0.050)
Benzo(b)fluoranthene	µg/L	1.2	0.36	0.39 J	0.12	**5.6**	0.57	0.81	ND(0.050)
Benzo(g,h,i)perylene	µg/L	0.26	0.11	0.14 J	0.021 J	**1.5**	0.17	0.23 J	ND(0.050)
Chrysene	µg/L	1.9	0.60	0.67	0.29	**5.1**	0.61	1.3	ND(0.050)
Fluorene	µg/L	1900	43	39	1.9	51	27	33	ND(0.050)
Naphthalene	µg/L	100	22	5.4	ND(0.061)	1.4	ND(0.060)	ND(0.61)	0.039 J
Phenanthrene	µg/L	1100	53	5.1	0.66	74	20	56	ND(0.060)
Pyrene	µg/L	130	4.7	5.7	2.3	19	3.4	7.4	ND(0.050)
Metals									
Lead	µg/L	5	ND(1.0)	-	-	ND(1.0)	-	-	-
Lead (dissolved)	µg/L	5	-	ND(1.0)	ND(1.0)	-	0.12 J	ND(1.0)	0.48 J
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-133**	**B-134**	**B-144**	**B-145**	**B-145**	**B-150**	**B-150**
Sample ID:		**PADEP**	**GW-11109613-B-133D-082416-AC-030**	**GW-11109613-B134-05-11-16-MM-041**	**GW-11109613-B144-05-11-16-AC-044**	**GW-11109613-B145-05-09-16-AC-029**	**GW-11109613-B-145-082416-KC-016**	**GW-11109613-B150-05-11-16-AC-046**	**GW-11109613-B-150-082416-AC-019**
Sample Date:		**Act2**	**08/25/2016**	**05/11/2016**	**05/11/2016**	**05/09/2016**	**08/24/2016**	**05/11/2016**	**08/24/2016**
Parameters	**Units**	**Used Aquifer NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	**460**	1 J	1 J	**ND(400)**	**76 J**
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(5)	ND(1)	ND(1)	**ND(200)**	**ND(50)**
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	0.7 J	140	1 J	2 J	ND(400)	31 J
Benzene	µg/L	5	ND(1)	2	**130**	**6**	**6**	**480000**	**320000**
Ethylbenzene	µg/L	700	ND(1)	ND(1)	260	1	1	320	270
Isopropyl benzene	µg/L	3500	ND(2)	100	35	77	74	**12000**	**7500**
Methyl tert butyl ether (MTBE)	µg/L	20	1	ND(1)	ND(5)	ND(1)	ND(1)	**ND(200)**	**ND(50)**
Toluene	µg/L	1000	ND(1)	0.6 J	74	2	2	**55000**	**33000**
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	0.5 J	1600	6	6	1400	1100
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.18	2.0	5.4	7.4	13	0.86	0.15 J
Benzo(a)anthracene	µg/L	4.9	ND(0.050)	0.46	2.0	0.68	0.67	0.52	0.10 J
Benzo(a)pyrene	µg/L	0.2	ND(0.050)	**0.25**	**1.2**	**0.33**	**0.22**	**0.40 J**	**ND(0.50)**
Benzo(b)fluoranthene	µg/L	1.2	ND(0.050)	0.30	**1.6**	0.36	0.24	0.53	ND(0.50)
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.050)	0.075	**0.42 J**	0.11	0.071	0.22 J	**ND(0.50)**
Chrysene	µg/L	1.9	ND(0.050)	0.39	**2.0**	0.47	0.49	0.53	ND(0.50)
Fluorene	µg/L	1900	0.014 J	8.7	1.1	34	50	2.8	0.90
Naphthalene	µg/L	100	ND(0.060)	ND(0.062)	19	4.4	3.3	52	31
Phenanthrene	µg/L	1100	0.55	7.1	6.6	23	41	4.5	1.2
Pyrene	µg/L	130	ND(0.050)	1.8	4.3	4.2	5.4	0.93	0.15 J
Metals									
Lead	µg/L	5	-	ND(1.0)	0.24 J	0.70 J	-	ND(1.0)	-
Lead (dissolved)	µg/L	5	ND(1.0)	-	-	-	0.13 J	-	0.12 J
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.030)	ND(0.028)	ND(0.029)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-152**	**B-152**	**B-153**	**B-154**	**B-155**	**B-156**	**B-158**
Sample ID:		**PADEP**	**GW-11109613-B152-05-09-16-AC-025**	**GW-11109613-DUP3-05-09-16-AC-027**	**GW-11109613-B153-05-04-16-RM-010**	**GW-11109613-B154-05-10-16-MM-038**	**GW-11109613-B155-05-05-16-AC-013**	**GW-11109613-B154-05-10-16-MM-036**	**GW-11109613-B158-05-09-16-AC-033**
Sample Date:		**Act2**	**05/09/2016**	**05/09/2016**	**05/04/2016**	**05/10/2016**	**05/05/2016**	**05/10/2016**	**05/09/2016**
		Used Aquifer		**Duplicate**					
Parameters	**Units**	**NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	5	4	ND(2)	**ND(400)**	62 J	4	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	**ND(200)**	**ND(50)**	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	3	3	ND(2)	ND(400)	ND(100)	5	ND(2)
Benzene	µg/L	5	**42**	**39**	ND(1)	**51000**	**120000**	**49**	ND(1)
Ethylbenzene	µg/L	700	3	3	ND(1)	ND(200)	120	4	ND(1)
Isopropyl benzene	µg/L	3500	120	110	ND(2)	150 J	79 J	120	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	**ND(200)**	**ND(50)**	ND(1)	ND(1)
Toluene	µg/L	1000	16	15	ND(1)	180 J	820	13	ND(1)
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	28	25	ND(1)	ND(200)	150	22	ND(1)
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	2.6	2.1	0.099	1.5	3.7	4.7	0.027 J
Benzo(a)anthracene	µg/L	4.9	0.12	0.14	0.052	0.12	0.31	1.7	0.058
Benzo(a)pyrene	µg/L	0.2	0.088	0.11	0.038 J	0.10	**0.25**	**1.4**	0.045 J
Benzo(b)fluoranthene	µg/L	1.2	0.11	0.13	0.040 J	0.084	0.24	**1.5**	0.051
Benzo(g,h,i)perylene	µg/L	0.26	0.058	0.081	0.018 J	0.054	0.088	**0.50**	0.029 J
Chrysene	µg/L	1.9	0.13	0.14	0.058	0.099	0.27	1.4	0.051
Fluorene	µg/L	1900	2.3	2.3	0.018 J	7.0	6.6	10	0.064
Naphthalene	µg/L	100	ND(0.060)	ND(0.061)	ND(0.061)	20	42	3.3	0.042 J
Phenanthrene	µg/L	1100	4.9	3.8	0.043 J	4.9	12	17	0.040 J
Pyrene	µg/L	130	1.5	1.6	0.27	0.51	1.3	3.4	0.22
Metals									
Lead	µg/L	5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	-	ND(1.0)	1.2
Lead (dissolved)	µg/L	5	-	-	-	-	ND(1.0)	-	-
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-158**	**B-162**	**B-163**	**B-164**	**B-164**	**B-165**	**B-168**
Sample ID:		**PADEP**	**GW-11109613-B-158-082216-AC-002**	**GW-11109613-B162-05-10-16-AC-039**	**GW-11109613-B163-05-10-16-AC-037**	**GW-11109613-B164-05-09-16-AC-031**	**GW-11109613-B-164-082316-KC-014**	**GW-11109613-B165-05-05-16-AC-015**	**GW-11109613-B168-05-04-16-AC-009**
Sample Date:		**Act2**	**08/22/2016**	**05/10/2016**	**05/10/2016**	**05/09/2016**	**08/23/2016**	**05/05/2016**	**05/04/2016**
		Used Aquifer							
Parameters	**Units**	**NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	0.9 J	ND(1)	1	4	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	5	5	5	2 J
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	2	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	0.5 J
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.037 J	0.62	0.044 J	0.026 J	0.057	0.48	0.52
Benzo(a)anthracene	µg/L	4.9	0.055	0.41	0.097	0.027 J	0.017 J	0.17	0.066
Benzo(a)pyrene	µg/L	0.2	0.042 J	**0.32**	0.090	0.047 J	0.019 J	0.039 J	0.037 J
Benzo(b)fluoranthene	µg/L	1.2	0.046 J	0.34	0.17	0.049 J	0.021 J	0.050 J	0.038 J
Benzo(g,h,i)perylene	µg/L	0.26	0.027 J	0.17	0.064	0.035 J	0.018 J	0.025 J	0.016 J
Chrysene	µg/L	1.9	0.045 J	0.47	0.13	0.027 J	0.013 J	0.13	0.063
Fluorene	µg/L	1900	0.094	1.4	1.2	0.081	0.069	1.4	2.1
Naphthalene	µg/L	100	0.078	0.61	ND(0.061)	ND(0.062)	0.037 J	ND(0.063)	ND(0.061)
Phenanthrene	µg/L	1100	0.043 J	0.56	0.037 J	ND(0.062)	0.045 J	0.37	0.92
Pyrene	µg/L	130	0.31	1.1	0.27	0.043 J	0.047 J	1.2	0.41
Metals									
Lead	µg/L	5	-	0.31 J	ND(1.0)	1.1	-	-	ND(1.0)
Lead (dissolved)	µg/L	5	0.89 J	-	-	-	1.9	1.0	-
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.028)	ND(0.028)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-169**	**B-169**	**B-170**	**B-170**	**B-170**	**B-172**	**B-172**
Sample ID:		**PADEP**	**GW-11109613-B169-05-09-16-MM-024**	**GW-11109613-B-169-082216-KC-001**	**GW-11109613-B170-05-05-16-AC-017**	**GW-11109613-DUP2-05-05-16-AC-019**	**GW-11109613-B-170-082216-KC-003**	**GW-11109613-B172-05-05-16-AC-021**	**GW-11109613-B-172-082316-AC-009**
Sample Date:		**Act2**	**05/09/2016**	**08/22/2016**	**05/05/2016**	**05/05/2016**	**08/22/2016**	**05/05/2016**	**08/23/2016**
		Used Aquifer				**Duplicate**			
Parameters	**Units**	**NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(10)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(10)
Benzene	µg/L	5	0.7 J	ND(1)	5	5	3	**13**	**160**
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	6	5	5	7	ND(10)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5)
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	2	1	0.7 J	0.6 J	ND(5)
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.084	ND(0.057)	0.36	0.37	0.26	0.33	0.33 J
Benzo(a)anthracene	µg/L	4.9	0.17	0.013 J	0.10	0.10	0.065	0.49	0.27 J
Benzo(a)pyrene	µg/L	0.2	0.17	0.015 J	0.11	0.090	0.043 J	**0.45**	0.18 J
Benzo(b)fluoranthene	µg/L	1.2	0.19	0.020 J	0.12	0.088	0.044 J	0.50	0.18 J
Benzo(g,h,i)perylene	µg/L	0.26	0.12	0.016 J	0.047 J	0.043 J	0.020 J	0.19	0.085 J
Chrysene	µg/L	1.9	0.17	0.017 J	0.11	0.11	0.069	0.51	0.25
Fluorene	µg/L	1900	0.043 J	ND(0.057)	2.5	2.3	0.61	0.42	0.56 J
Naphthalene	µg/L	100	0.071	ND(0.069)	2.3	4.8	ND(0.068)	0.27	ND(0.061)
Phenanthrene	µg/L	1100	0.069	ND(0.069)	1.3	1.8	0.99	0.38	0.26 J
Pyrene	µg/L	130	0.27	0.035 J	0.35	0.34	0.31	1.4	1.0
Metals									
Lead	µg/L	5	**33.8**	-	-	-	-	-	-
Lead (dissolved)	µg/L	5	-	**6.5**	ND(1.0)	ND(1.0)	ND(1.0)	0.18 J	0.30 J
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.029)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-172**	**B-173**	**B-173**	**B-174**	**B-174**	**B-175**	**B-175**
Sample ID:		**PADEP**	**GW-11109613-B-172D-082316-AC-011**	**GW-11109613-B173-05-05-16-RM-018**	**GW-11109613-B-173-082316-KC-012**	**GW-11109613-B174-05-05-16-RM-016**	**GW-11109613-B-174-082216-KC-007**	**GW-11109613-B175-05-11-16-MM-045**	**GW-11109613-B-175-082316-AC-015**
Sample Date:		**Act2**	**08/23/2016**	**05/05/2016**	**08/23/2016**	**05/05/2016**	**08/22/2016**	**05/11/2016**	**08/23/2016**
		Used Aquifer	**Duplicate**						
Parameters	**Units**	**NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(10)	ND(20)	5	ND(2)	ND(2)	4 J	2 J
1,2-Dichloroethane	µg/L	5	ND(5)	**ND(10)**	ND(1)	ND(1)	ND(1)	ND(5)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	ND(10)	13 J	14	ND(2)	ND(2)	51	10
Benzene	µg/L	5	**160**	**14**	**17**	ND(1)	ND(1)	**260**	**65**
Ethylbenzene	µg/L	700	ND(5)	ND(10)	4	ND(1)	ND(1)	25	5
Isopropyl benzene	µg/L	3500	ND(10)	27	33	ND(2)	ND(2)	150	63
Methyl tert butyl ether (MTBE)	µg/L	20	ND(5)	ND(10)	ND(1)	5	7	ND(5)	ND(1)
Toluene	µg/L	1000	ND(5)	5 J	5	ND(1)	ND(1)	70	15
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(5)	ND(10)	8	ND(1)	ND(1)	33	11
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.10 J	6.0	6.1	0.096	0.095	1.7	0.78
Benzo(a)anthracene	µg/L	4.9	0.13 J	2.1	1.2	0.048 J	0.080	1.3	0.36
Benzo(a)pyrene	µg/L	0.2	0.092 J	**1.0**	**0.51 J**	0.032 J	0.060 J	**0.89**	**0.22 J**
Benzo(b)fluoranthene	µg/L	1.2	0.094 J	1.0	0.55 J	0.038 J	0.065 J	1.1	0.27 J
Benzo(g,h,i)perylene	µg/L	0.26	0.041 J	0.25 J	0.12 J	0.015 J	0.034 J	**0.38**	0.096 J
Chrysene	µg/L	1.9	0.15	1.4	0.90	0.042 J	0.081	1.2	0.33
Fluorene	µg/L	1900	0.23 J	16	18	0.25	0.27	5.9	3.2
Naphthalene	µg/L	100	ND(0.064)	13	12	0.099	0.083	ND(0.061)	ND(0.062)
Phenanthrene	µg/L	1100	0.036 J	23	22	0.43	0.48	8.7	3.5
Pyrene	µg/L	130	0.86	6.4	4.8	0.19	0.33	2.3	0.93
Metals									
Lead	µg/L	5	-	-	-	-	-	**6.9**	-
Lead (dissolved)	µg/L	5	0.25 J	0.75 J	1.4	ND(1.0)	1.9	-	3.1
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.028)	0.020 J	ND(0.028)	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**U-4**	**U-4**	**URS-1**	**URS-1**	**URS-3**	**URS-3**	**URS-3**
Sample ID:		**PADEP**	**GW-11109613-U4-05-05-16-AC-022**	**GW-11109613-U-4-082216-AC-004**	**GW-11109613-URS1-05-09-16-MM-028**	**GW-11109613-URS-1-082316-AC-013**	**GW-11109613-URS3-05-09-16-MM-030**	**GW-11109613-URS-3-082416-KC-024**	**GW-11109613-URS-3-082416-KC-025**
Sample Date:		**Act2**	**05/05/2016**	**08/22/2016**	**05/09/2016**	**08/23/2016**	**05/09/2016**	**08/24/2016**	**08/24/2016**
		Used Aquifer							
Parameters	**Units**	**NR MSC**							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	0.5 J
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	0.8 J	0.7 J	0.8 J
Benzene	µg/L	5	2	ND(1)	ND(1)	ND(1)	4	2	1
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	0.6 J	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	ND(2)	55	2 J	17
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	0.9 J	ND(1)	ND(1)	ND(1)	2	0.9 J	1
Total BTEX	µg/L		-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	9	8	7
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.058	0.32 J	0.33	0.62	21	0.17	9.6
Benzo(a)anthracene	µg/L	4.9	0.42	0.99	0.038 J	0.017 J	**66**	**5.3**	**17**
Benzo(a)pyrene	µg/L	0.2	**0.78**	**2.7 J**	0.028 J	ND(0.053) J	**47**	**4.5**	**12**
Benzo(b)fluoranthene	µg/L	1.2	0.33	1.1 J	0.034 J	ND(0.053) J	**56**	**5.4**	**14**
Benzo(g,h,i)perylene	µg/L	0.26	**0.44**	**2.4 J**	0.012 J	ND(0.053) J	**14**	**1.4**	**3.2**
Chrysene	µg/L	1.9	1.1	**4.5**	0.035 J	0.012 J	**46**	**3.9**	**12**
Fluorene	µg/L	1900	0.085	0.22 J	5.2	16	27	4.9	28
Naphthalene	µg/L	100	ND(0.062)	9.3	0.29	4.4	3.2	ND(0.065)	ND(0.061)
Phenanthrene	µg/L	1100	ND(0.062)	ND(0.60)	0.73	0.98	55	2.5	40
Pyrene	µg/L	130	1.1	2.9	0.18	0.32	130	8.4	31
Metals									
Lead	µg/L	5	-	-	ND(1.0)	-	1.3	-	-
Lead (dissolved)	µg/L	5	0.50 J	0.78 J	-	0.22 J	-	-	2.1
Fumigant									
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.029)	0.011 J	ND(0.028)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7a

Groundwater Analytical Results Summary - Shallow Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**URS-4**	**URS-4**	**URS-5**	**URS-5**	**URS-5**
Sample ID:		**PADEP**	**GW-11109613-URS4-05-09-16-MM-026**	**GW-11109613-URS-4-082416-AC-017**	**GW-11109613-URS5-05-10-16-MM-040**	**GW-11109613-URS-5-082416-AC-020**	**GW-11109613-URS-5-082416-KC-021**
Sample Date:		**Act2**	**05/09/2016**	**08/24/2016**	**05/10/2016**	**08/24/2016**	**08/24/2016**
Parameters	**Units**	**Used Aquifer NR MSC**					
Volatile Organic Compounds							
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	**190**	**92**	**230**
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	**ND(25)**	**ND(10)**	**ND(20)**
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	56	27	72
Benzene	µg/L	5	ND(1)	ND(1)	**4000**	**2300**	**4900**
Ethylbenzene	µg/L	700	ND(1)	ND(1)	560	280	530
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	22 J	13 J	31 J
Methyl tert butyl ether (MTBE)	µg/L	20	2	2	**ND(25)**	ND(10)	ND(20)
Toluene	µg/L	1000	ND(1)	ND(1)	**8600**	**1500**	**6500**
Total BTEX	µg/L		-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	3000	1500	2800
Semi-Volatile Organic Compounds							
Anthracene	µg/L	66	0.052	0.027 J	5.6	3.3	4.8
Benzo(a)anthracene	µg/L	4.9	0.012 J	ND(0.050)	0.96	0.23	0.46 J
Benzo(a)pyrene	µg/L	0.2	ND(0.050)	ND(0.050)	**0.27 J**	0.058	0.15 J
Benzo(b)fluoranthene	µg/L	1.2	ND(0.050)	ND(0.050)	0.24 J	0.056	0.14 J
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.050)	ND(0.050)	**ND(0.51)**	0.017 J	**ND(0.51)**
Chrysene	µg/L	1.9	ND(0.050)	ND(0.050)	0.53	0.11	0.25 J
Fluorene	µg/L	1900	0.019 J	0.022 J	14	1.5	14
Naphthalene	µg/L	100	ND(0.060)	ND(0.060)	**260**	**150**	**220**
Phenanthrene	µg/L	1100	0.055 J	ND(0.060)	20	12	21
Pyrene	µg/L	130	0.074	0.067	3.5	1.7	2.8
Metals							
Lead	µg/L	5	ND(1.0)	-	ND(1.0)	-	-
Lead (dissolved)	µg/L	5	-	ND(1.0)	-	ND(1.0)	0.14 J
Fumigant							
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.029)	**0.089**	ND(0.040)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 7b

Groundwater Analytical Results Summary - Semi-Confirmed (Lower) Aquifer
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			**B-48D**	**B-132D**	**B-133D**	**B-134D**	**B-134D**
Sample ID:		**PADEP**	**GW-11109613-B48D-05-03-16-AC-005**	**GW-11109613-B132D-05-03-16-RM-002**	**GW-11109613-B133D-05-03-16-RM-004**	**GW-11109613-B134D-05-03-16-AC-001**	**GW-11109613-DUP1-05-03-16-AC-003**
Sample Date:		**Act2**	**05/03/2016**	**05/03/2016**	**05/03/2016**	**05/03/2016**	**05/03/2016**
		Used Aquifer					**Duplicate**
Parameters	**Units**	**NR MSC**					
Volatile Organic Compounds							
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	12	2	1	2	1
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L		-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds							
Anthracene	µg/L	66	0.42	0.088	0.18	0.069	0.039 J
Benzo(a)anthracene	µg/L	4.9	0.044 J	0.018 J	0.024 J	ND(0.051)	0.011 J
Benzo(a)pyrene	µg/L	0.2	ND(0.050)	0.017 J	0.017 J	ND(0.051)	0.012 J
Benzo(b)fluoranthene	µg/L	1.2	ND(0.050)	0.018 J	0.015 J	ND(0.051)	0.013 J
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.050)	0.013 J	0.010 J	ND(0.051)	0.017 J
Chrysene	µg/L	1.9	0.034 J	0.015 J	0.021 J	ND(0.051)	ND(0.051)
Fluorene	µg/L	1900	2.3	0.018 J	0.030 J	0.012 J	0.011 J
Naphthalene	µg/L	100	ND(0.060)	0.082	ND(0.060)	ND(0.061)	ND(0.061)
Phenanthrene	µg/L	1100	2.4	0.18	0.49	0.27	0.27
Pyrene	µg/L	130	0.43	0.033 J	0.047 J	0.017 J	0.020 J
Metals							
Lead	µg/L	5	ND(1.0)	ND(1.0)	1.4	0.14 J	0.14 J
Lead (dissolved)	µg/L	5	-	-	-	-	-
Fumigant							
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.029)	ND(0.028)

Notes:

ND	Not detected at the associated reporting limit.
J	Estimated concentration.
ND(10)	Indicates the laboratory method detection limit (if available) was above the applicable standard. The reporting limit is shown if the laboratory method detection limit is not available.
Value	Concentration exceeds applicable criteria

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-39					B-43		B-45			B-46		B-48		B-48D						
Sample Date			8-Jan-13	8-Jan-13	11-May-16	24-Aug-16	24-Aug-16	23-May-16	22-Aug-16	7-Jan-13	7-Jan-13	5-May-16	7-Jan-13	7-Jan-13	4-Jan-13	4-Jan-13	5-Feb-13	5-Feb-13	5-Feb-13	5-Feb-13	1-Apr-13	1-Apr-13	3-May-16
Sample ID			B39_010813	B39_010813	GW-11109613-B39-05-11-16-MM-043	GW-11109613-B-39-082416-AC-022	GW-11109613-B-39-082416-KC-023	B-43-20160523	GW-11109613-B-43-082216-KC-005	B-45_010713	B-45_010713	GW-11109613-B45-05-05-16-RM-014	B46_010713	B46_010713	B48_010413	B48_010413	B-48D_020513	B-48D_020513	B-48D_020513	B-48D_020513	B-48D_40113	B-48D_40113	GW-11109613-B48D-05-03-16-AC-005
Sampling Company			UNKNOWN	UNKNOWN	GHD	GHD	GHD	STANTEC	GHD	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LANGAN	LANGAN	GHD
Laboratory			ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL
Laboratory Work Order			JB25964	JB25964	1660120	1700681	1700681	1666456	1699628	JB25835	JB25835	1658374	JB25834	JB25834	JB25729	JB25729	JB28204	JB28204	JB28204R	JB28204R	JB32976	JB32976	1657425
Laboratory Sample ID	Units	MSC-PA	JB25964-4	JB25964-4F	8378039	8553514	8553515	8402590	8548681	JB25835-10	JB25835-10F	8370269	JB25834-5	JB25834-5F	JB25729-4	JB25729-4F	JB28204-3	JB28204-3F	JB28204-3FR	JB28204-3R	JB32976-7	JB32976-7F	8365508
Field Parameters																							
Conductivity	mS/cm	n/v	-	-	NM	-	-	-	0.34	-	-	3.48	-	-	-	-	-	-	-	-	-	-	0.62
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	NM	-	-	3.08	15.08	-	-	0	-	-	-	-	-	-	-	-	-	-	0
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	NM	-	-	-138	-135	-	-	-140	-	-	-	-	-	-	-	-	-	-	-83
pH, FIELD MEASURED	S.U.	n/v	-	-	NM	-	-	7.69	7.84	-	-	7.16	-	-	-	-	-	-	-	-	-	-	6.44
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	0.376	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	NM	-	-	18.37	25.7	-	-	12.6	-	-	-	-	-	-	-	-	-	-	15.27
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	0.245	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	NM	-	-	89.2	378	-	-	3	-	-	-	-	-	-	-	-	-	-	40.1
Volatile Organic Compounds																							
Benzene	µg/L	5	**44.0 (1.0)**	-	3 (0.5)	4 (0.5)	3 (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (1.0) (0.26)	-	ND (1) (0.5)
Ethylbenzene	µg/L	700	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	2.0 (1.0)	-	2.0 (1.0)	-	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)
Isopropylbenzene (Cumene)	µg/L	3500	30.1 (2.0)	-	11 (0.5)	26 (0.5)	17 (0.5)	4 (0.5)	6 (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	-	-	-	-	ND (2.0) (0.45)	-	ND (2) (0.5)
Methyl Tertiary Butyl Ether	µg/L	20	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	-	-	-	-	6.2 (0.16)	-	12 (0.5)
Toluene	µg/L	1000	3.1 (1.0)	-	0.7 J (0.5)	2 (0.5)	2 (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)
Total BTEX	µg/L	n/v	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	ND (2.0) (2.0)	-	ND (2) (0.5)	1 J (0.5)	0.6 J (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	3.7 (2.0)	-	3.7 (2.0)	-	-	-	-	-	ND (2.0) (0.19)	-	ND (2) (0.5)
1,3,5-Trimethylbenzene	µg/L	1200	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	-	-	-	-	ND (2.0) (0.36)	-	ND (2) (0.5)
Xylenes, Total (Dimethylbenzene)	µg/L	10000	3.8 (1.0)	-	4 (0.5)	5 (0.5)	4 (0.5)	ND (0.5) (0.5)	0.6 J (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	7.3 (1.0)	-	7.4 (1.0)	-	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	**0.057 (0.010)**	ND (0.028) (0.010)	ND (0.0097) (0.010)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	-	-	-	-	ND (0.020) (0.011)	-	ND (0.029) (0.0096)
Semi-Volatile Organic Compounds																							
Anthracene	µg/L	66	14.2 (1.0)	-	5.8 (0.10)	1.6 (0.010)	0.41 (0.010)	0.7 (0.1)	0.22 (0.010)	ND (0.10) (0.10)	-	0.042 J (0.010)	ND (0.10) (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	0.262 (0.020)	-	0.42 (0.010)
Benzo(a)Anthracene	µg/L	4.9	**8.27 (1.0)**	-	3.0 (0.10)	0.48 (0.010)	0.086 (0.010)	2 (0.1)	0.89 (0.010)	ND (0.10) (0.10)	-	0.021 J (0.010)	0.175 (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (0.10) (0.012)	-	0.044 J (0.010)
Benzo(a)Pyrene	µg/L	0.2	**6.03 (1.0)**	-	**2.5 (0.10)**	**0.34 (0.010)**	0.071 (0.010)	**2 (0.1)**	**0.66 J (0.010)**	ND (0.10) (0.10)	-	0.030 J (0.010)	0.177 (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (0.10) (0.012)	-	ND (0.050) (0.010)
Benzo(b)Fluoranthene	µg/L	1.2	**6.09 (1.0)**	-	**3.1 (0.10)**	0.47 (0.010)	0.083 (0.010)	**2 (0.1)**	0.75 J (0.010)	ND (0.10) (0.10)	-	0.043 J (0.010)	0.167 (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (0.10) (0.010)	-	ND (0.050) (0.010)
Benzo(g,h,i)Perylene	µg/L	0.26	**2.89 (1.0)**	-	**1.5 (0.10)**	0.16 (0.010)	0.057 (0.010)	**1 (0.1)**	**0.32 J (0.010)**	ND (0.10) (0.10)	-	0.033 J (0.010)	0.120 (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (0.10) (0.016)	-	ND (0.050) (0.010)
Chrysene	µg/L	1.9	**6.78 (1.0)**	-	**2.6 (0.10)**	0.43 (0.010)	0.090 (0.010)	**3 (0.1)**	1.0 (0.010)	ND (0.10) (0.10)	-	0.050 J (0.010)	0.190 (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	ND (0.10) (0.012)	-	0.034 J (0.010)
Fluorene	µg/L	1900	36.6 (1.0)	-	14 (0.10)	5.5 (0.010)	3.0 (0.010)	0.9 (0.1)	0.34 (0.010)	ND (0.10) (0.10)	-	0.042 J (0.010)	0.319 (0.10)	-	2.12 (1.0)	-	-	-	-	-	1.07 (0.017)	-	2.3 (0.010)
Naphthalene	µg/L	100	ND (0.10) (0.10)	-	8.0 (0.30)	4.4 (0.030)	ND (0.064) (0.030)	ND (0.1) (0.1)	ND (0.063) (0.030)	ND (0.10) (0.10)	-	ND (0.061) (0.031)	0.914 (0.10)	-	1.44 (1.0)	-	-	-	-	-	ND (0.10) (0.036)	-	ND (0.060) (0.030)
Phenanthrene	µg/L	1100	74.9 (1.0)	-	25 (0.30)	6.0 (0.030)	0.86 (0.030)	ND (0.1) (0.1)	0.24 (0.030)	ND (0.10) (0.10)	-	0.065 (0.031)	0.219 (0.10)	-	1.26 (1.0)	-	-	-	-	-	0.920 (0.021)	-	2.4 (0.030)
Pyrene	µg/L	130	24.1 (1.0)	-	6.4 (0.10)	1.1 (0.010)	0.35 (0.010)	7 (0.1)	2.9 (0.010)	0.115 (0.10)	-	0.085 (0.010)	0.530 (0.10)	-	ND (1.0) (1.0)	-	-	-	-	-	0.270 (0.015)	-	0.43 (0.010)
Metals																							
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (3.0) (3.0)	-	-	-	2.3 J (0.97)	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50) (50)	-	-	-	ND (50) (0.59)	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33700 (100)	-	-	-	40100 (24)	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (3.0) (3.0)	-	-	-	**6.4 (1.7)**	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**950 (15)**	-	-	-	**2210 (0.40)**	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.20)	ND (0.20) (0.089)	-	-
Metals, Dissolved																							
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (3.0) (3.0)	-	-	-	1.8 J (0.97)	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50) (50)	-	-	-	ND (50) (0.59)	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25200 (100)	-	-	-	24800 (24)	-
Lead	µg/L	5	-	**5.7 (3.0)**	**16.7 (0.13)**	2.1 (0.090)	4.7 (0.090)	ND (0.13) (0.13)	2.8 (0.09)	-	ND (3.0) (3.0)	0.14 J (0.13)	-	4.2 (3.0)	-	ND (3.0) (3.0)	-	ND (3.0) (3.0)	-	-	-	**5.2 (1.7)**	ND (1.0) (0.13)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2070 (15)**	-	-	-	**2110 (0.40)**	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.20)	-	-	ND (0.20) (0.089)	-
General Chemistry																							
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	350000 (5000)	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	350000 (3500)	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64500 (48)	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150 B (5.1)	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9500 (330)	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20 B (5.6)	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20 B (4.6)	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10) (1)	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	380 B (380)	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	680 B (280)	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4800 (240)	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300000 (1800)	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-92		B-94		B-95	B-115			B-116						B-117		B-123		B-125			
Sample Date			8-Jan-13	8-Jan-13	7-Jan-13	7-Jan-13	23-May-16	4-Jan-13	4-Jan-13	4-May-16	4-Jan-13	4-Jan-13	4-May-16	24-Aug-16	25-Aug-16	25-Aug-16	4-May-16	22-Aug-16	8-Jan-13	8-Jan-13	8-Jan-13	8-Jan-13	9-May-16	23-Aug-16
Sample ID			B92_010813	B92_010813	B94_010713	B94_010713	B-95-20160523	B115_010413	B115_010413	GW-11109613-B115-05-04-16-AC-007	B116_010413	B116_010413	GW-11109613-B116-05-04-16-RM-006	GW-11109613-B-116-082416-AC-026	GW-11109613-B-116-082416-AC-027	GW-11109613-B-116D-082416-AC-028	GW-11109613-B117-05-04-16-AC-008	GW-11109613-B-117-082216-AC-006	B123_010813	B123_010813	B125_010813	B125_010813	GW-11109613-B125-05-09-16-MM-032	GW-11109613-B-125-082316-KC-010
Sampling Company			UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD
Laboratory			ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order			JB25963	JB25963	JB25834	JB25834	1666456	JB25729	JB25729	1657425	JB25729	JB25729	1657425	1700681	1700681	1700681	1657425	1699628	JB25963	JB25963	JB25964	JB25964	1659064	1699628
Laboratory Sample ID	Units	MSC-PA	JB25963-4	JB25963-4F	JB25834-1	JB25834-1F	8402591	JB25729-1	JB25729-1F	8365510	JB25729-2	JB25729-2F	8365509	8553518	8553520	8553521	8365511	8548682	JB25963-1	JB25963-1F	JB25964-1	JB25964-1F	8373137	8548687
Field Parameters																								
Conductivity	mS/cm	n/v	-	-	-	-	-	-	-	0.866	-	-	1.44	-	1.42	1.42	1.67	1.4	-	-	-	-	5.06	5.81
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	-	-	2.5	-	-	4.88	-	-	0	-	7.38	7.38	0	1.83	-	-	-	-	0.68	2.72
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-	-	-83	-	-	-22	-	-	-66	-	111	111	-49	-128	-	-	-	-	-152	-146
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	7.49	-	-	6.67	-	-	6.29	-	6.55	6.55	6.11	6.57	-	-	-	-	6.8	6.92
Specific Conductance Field	mS/cm	n/v	-	-	-	-	0.518	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	-	-	17.52	-	-	13	-	-	13.3	-	23	23	13.4	22.94	-	-	-	-	15.6	23.2
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	0.331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	-	-	74.2	-	-	10	-	-	470	-	282	282	42	365	-	-	-	-	0	0.1
Volatile Organic Compounds																								
Benzene	µg/L	5	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (0.5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	**173 (1.0)**	-	**9 (0.5)**	**9 (0.5)**
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (0.5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
Ethylbenzene	µg/L	700	1.0 (1.0)	-	1.2 (1.0)	-	ND (0.5) (0.5)	2.0 (1.0)	-	ND (1) (0.5)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	1.4 (1.0)	-	1.3 (1.0)	-	0.6 J (0.5)	ND (1) (0.5)
Isopropylbenzene (Cumene)	µg/L	3500	11.0 (2.0)	-	ND (2.0) (2.0)	-	ND (0.5) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	0.5 J (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	29.7 (2.0)	-	14.0 (2.0)	-	8 (0.5)	9 (0.5)
Methyl Tertiary Butyl Ether	µg/L	20	ND (1.0) (1.0)	-	12.3 (1.0)	-	ND (0.5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
Toluene	µg/L	1000	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (0.5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	6.1 (1.0)	-	3 (0.5)	4 (0.5)
Total BTEX	µg/L	n/v	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	2.3 (2.0)	-	2.5 (2.0)	-	ND (0.5) (0.5)	3.7 (2.0)	-	ND (2) (0.5)	3.4 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	2.4 (2.0)	-	ND (2.0) (2.0)	-	2 J (0.5)	0.8 J (0.5)
1,3,5-Trimethylbenzene	µg/L	1200	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	ND (0.5) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	3 (0.5)	2 (0.5)
Xylenes, Total (Dimethylbenzene)	µg/L	10000	4.8 (1.0)	-	4.7 (1.0)	-	ND (0.5) (0.5)	7.4 (1.0)	-	ND (1) (0.5)	6.3 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	6.0 (1.0)	-	9.0 (1.0)	-	30 (0.5)	25 (0.5)
Volatile Organic Compounds (SW8011)																								
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	ND (0.0097) (0.010)	ND (0.020) (0.020)	-	ND (0.028) (0.0095)	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.028) (0.0095)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.028) (0.010)
Semi-Volatile Organic Compounds																								
Anthracene	µg/L	66	6.00 (1.0)	-	0.154 (0.10)	-	ND (0.1) (0.1)	ND (1.0) (1.0)	-	0.065 (0.010)	0.363 (0.10)	-	0.27 (0.010)	0.036 J (0.010)	0.11 (0.010)	0.080 (0.010)	1.8 (0.010)	1.0 (0.010)	4.51 (0.11)	-	2.15 (0.10)	-	1.5 (0.010)	1.9 (0.010)
Benzo(a)Anthracene	µg/L	4.9	0.360 (0.10)	-	ND (0.10) (0.10)	-	0.2 J (0.1)	ND (1.0) (1.0)	-	0.034 J (0.010)	ND (0.10) (0.10)	-	0.058 (0.010)	0.021 J (0.010)	0.045 J (0.010)	0.028 J (0.010)	0.46 (0.010)	0.25 (0.010)	ND (0.11) (0.11)	-	0.559 (0.10)	-	0.45 (0.010)	0.16 (0.010)
Benzo(a)Pyrene	µg/L	0.2	0.133 (0.10)	-	ND (0.10) (0.10)	-	**0.3 J (0.1)**	ND (1.0) (1.0)	-	ND (0.052) (0.010)	ND (0.10) (0.10)	-	0.013 J (0.010)	ND (0.050) (0.010)	0.018 J (0.010)	ND (0.051) (0.010)	**0.34 (0.010)**	0.19 J (0.010)	ND (0.11) (0.11)	-	**0.262 (0.10)**	-	**0.23 (0.010)**	0.040 J (0.010)
Benzo(b)Fluoranthene	µg/L	1.2	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.2 J (0.1)	ND (1.0) (1.0)	-	0.012 J (0.010)	ND (0.10) (0.10)	-	0.017 J (0.010)	ND (0.050) (0.010)	0.023 J (0.010)	ND (0.051) (0.010)	0.42 (0.010)	0.23 J (0.010)	ND (0.11) (0.11)	-	0.224 (0.10)	-	0.25 (0.010)	0.046 J (0.010)
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.2 J (0.1)	ND (1.0) (1.0)	-	ND (0.052) (0.010)	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.051) (0.010)	ND (0.051) (0.010)	0.22 (0.010)	0.13 J (0.010)	ND (0.11) (0.11)	-	ND (0.10) (0.10)	-	0.070 (0.010)	0.012 J (0.010)
Chrysene	µg/L	1.9	0.315 (0.10)	-	ND (0.10) (0.10)	-	0.4 J (0.1)	ND (1.0) (1.0)	-	0.035 J (0.010)	ND (0.10) (0.10)	-	0.066 (0.010)	0.031 J (0.010)	0.059 (0.010)	0.039 J (0.010)	0.54 (0.010)	0.34 (0.010)	ND (0.11) (0.11)	-	0.414 (0.10)	-	0.34 (0.010)	0.13 (0.010)
Fluorene	µg/L	1900	28.0 (1.0)	-	1.16 (0.10)	-	ND (0.1) (0.1)	ND (1.0) (1.0)	-	0.13 (0.010)	1.50 (0.10)	-	1.5 (0.010)	0.054 (0.010)	1.1 (0.010)	0.91 (0.010)	0.74 (0.010)	0.24 (0.010)	14.4 (1.1)	-	5.77 (1.0)	-	4.8 (0.010)	6.6 (0.010)
Naphthalene	µg/L	100	1.18 (0.10)	-	0.601 (0.10)	-	ND (0.1) (0.1)	1.24 (1.0)	-	ND (0.063) (0.031)	0.793 (0.10)	-	0.070 (0.030)	0.031 J (0.030)	ND (0.061) (0.030)	ND (0.062) (0.030)	0.11 (0.031)	ND (0.061) (0.030)	2.12 (0.11)	-	1.16 (0.10)	-	0.40 (0.030)	0.31 (0.030)
Phenanthrene	µg/L	1100	30.4 (1.0)	-	1.18 (0.10)	-	ND (0.1) (0.1)	ND (1.0) (1.0)	-	0.40 (0.031)	0.946 (0.10)	-	0.054 J (0.030)	ND (0.060) (0.030)	ND (0.061) (0.030)	ND (0.062) (0.030)	0.94 (0.031)	1.1 (0.030)	5.34 (1.1)	-	1.48 (0.10)	-	1.2 (0.030)	3.3 (0.030)
Pyrene	µg/L	130	2.91 (0.10)	-	0.384 (0.10)	-	0.7 (0.1)	ND (1.0) (1.0)	-	0.24 (0.010)	0.383 (0.10)	-	0.65 (0.010)	0.29 (0.010)	0.39 (0.010)	0.32 (0.010)	3.3 (0.010)	2.4 (0.010)	2.44 (0.11)	-	2.55 (0.10)	-	2.1 (0.010)	1.4 (0.010)
Metals																								
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																								
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	4.1 (3.0)	-	ND (3.0) (3.0)	ND (0.13) (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	0.88 J (0.13)	ND (1.0) (0.090)	0.14 J (0.090)	0.16 J (0.090)	ND (1.0) (0.13)	0.25 J (0.09)	-	ND (3.0) (3.0)	-	4.4 (3.0)	0.24 J (0.13)	ND (1.0) (0.09)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																								
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-126				B-131									B-132		B-132D		
Sample Date			7-Jan-13	7-Jan-13	10-May-16	23-Aug-16	8-Jan-13	8-Jan-13	8-Apr-13	8-Apr-13	8-Apr-13	2-Jun-14	2-Jun-14	20-May-15	5-May-16	11-May-16	24-Aug-16	29-Mar-13	29-Mar-13	3-May-16
Sample ID			B-126_010713	B-126_010713	GW-11109613-B126-05-10-16-MM-035	GW-11109613-B-126-082316-KC-008	B131_010813	B131_010813	B-131	B-131_040813	B-131_040813	B-131	B-131	B-131_20150520	GW-11109613-B131-05-05-16-RM-012	GW-11109613-B132-05-11-16-AC-042	GW-11109613-B-132-082416-AC-018	B-132D_32913	B-132D_32913	GW-11109613-B132D-05-03-16-RM-002
Sampling Company			UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	GHD	GHD	GHD	LANGAN	LANGAN	GHD
Laboratory			ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	ACCUTEST	ACCUTEST	LL
Laboratory Work Order			JB25835	JB25835	1659064	1699628	JB25964	JB25964	20140718EZ	JB33644	JB33644	JB68336	JB68336	1562821	1658374	1660120	1700681	JB32843	JB32843	1657425
Laboratory Sample ID	Units	MSC-PA	JB25835-1	JB25835-1F	8373140	8548685	JB25964-2	JB25964-2F	UNKNOWN	JB33644-16	JB33644-16F	JB68336-14	JB68336-14F	7896253	8370267	8378038	8553510	JB32843-2	JB32843-2F	8365505
Field Parameters																				
Conductivity	mS/cm	n/v	-	-	1.19	1.27	-	-	-	-	-	-	-	-	1.01	NM	-	-	-	1.12
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	18.5	12.69	-	-	-	-	-	-	-	0.55	0	NM	-	-	-	0
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-118	-168	-	-	-	-	-	-	-	-103	-95	NM	-	-	-	-77
pH, FIELD MEASURED	S.U.	n/v	-	-	7.07	7.07	-	-	-	-	-	-	-	7.87	6.84	NM	-	-	-	6.13
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	0.956	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	13.3	23.4	-	-	-	-	-	-	-	14.17	11.9	NM	-	-	-	14.8
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	0.611	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	0	0	-	-	-	-	-	-	-	18.8	0	NM	-	-	-	170
Volatile Organic Compounds																				
Benzene	µg/L	5	**189 (5.0)**	-	**95 (5)**	**78 (0.5)**	**19.7 (1.0)**	-	-	1.1 (0.24)	-	0.29 J (0.21)	-	2 (0.5)	1 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (10) (5)	ND (5) (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.26)	-	ND (1) (0.5)
Ethylbenzene	µg/L	700	17.7 (1.0)	-	13 (5)	9 (0.5)	ND (1.0) (1.0)	-	-	0.32 J (0.23)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)
Isopropylbenzene (Cumene)	µg/L	3500	63.5 (2.0)	-	60 (5)	40 (0.5)	10.6 (2.0)	-	-	13 (0.45)	-	12.1 (0.26)	-	11 (0.5)	8 (0.5)	8 (0.5)	5 (0.5)	ND (2.0) (0.45)	-	ND (2) (0.5)
Methyl Tertiary Butyl Ether	µg/L	20	ND (1.0) (1.0)	-	ND (10) (5)	ND (5) (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.16)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	2.1 (0.16)	-	2 (0.5)
Toluene	µg/L	1000	43.1 (1.0)	-	40 (5)	29 (0.5)	ND (1.0) (1.0)	-	-	0.61 J (0.23)	-	0.30 J (0.22)	-	0.9 J (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)
Total BTEX	µg/L	n/v	-	-	-	-	-	-	2.65 ()	-	-	-	-	3.5 ()	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	12.3 (2.0)	-	8 J (5)	5 J (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.19)	-	ND (2) (0.5)
1,3,5-Trimethylbenzene	µg/L	1200	6.6 (2.0)	-	7 J (5)	4 J (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.36)	-	ND (2) (0.5)
Xylenes, Total (Dimethylbenzene)	µg/L	10000	76.2 (1.0)	-	64 (5)	47 (0.5)	1.1 (1.0)	-	-	0.62 J (0.24)	-	0.56 J (0.20)	-	0.6 J (0.5)	0.6 J (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																				
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-	ND (0.0096) (0.010)	ND (0.029) (0.0097)	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.020) (0.011)	-	ND (0.028) (0.0094)
Semi-Volatile Organic Compounds																				
Anthracene	µg/L	66	10.5 (1.0)	-	9.1 (0.010)	6.6 (0.010)	0.916 (0.10)	-	-	0.477 (0.02)	-	0.747 (0.020)	-	0.7 (0.1)	0.76 (0.010)	13 (0.10)	1.5 (0.010)	ND (0.10) (0.020)	-	0.088 (0.010)
Benzo(a)Anthracene	µg/L	4.9	0.363 (0.10)	-	0.71 (0.010)	0.82 (0.010)	0.356 (0.10)	-	-	0.169 (0.012)	-	0.258 (0.012)	-	0.4 J (0.1)	0.37 (0.010)	**7.7 (0.10)**	0.88 (0.010)	ND (0.10) (0.012)	-	0.018 J (0.010)
Benzo(a)Pyrene	µg/L	0.2	0.119 (0.10)	-	**0.38 (0.010)**	**0.39 J (0.010)**	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	0.2 J (0.1)	0.090 (0.010)	**4.4 (0.10)**	**0.49 (0.010)**	ND (0.10) (0.012)	-	0.017 J (0.010)
Benzo(b)Fluoranthene	µg/L	1.2	ND (0.10) (0.10)	-	0.36 (0.010)	0.39 J (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.01)	-	ND (0.10) (0.010)	-	0.2 J (0.1)	0.12 (0.010)	**5.6 (0.10)**	0.57 (0.010)	ND (0.10) (0.010)	-	0.018 J (0.010)
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.10)	-	0.11 (0.010)	0.14 J (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.016)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	0.021 J (0.010)	**1.5 (0.10)**	0.17 (0.010)	ND (0.10) (0.016)	-	0.013 J (0.010)
Chrysene	µg/L	1.9	0.296 (0.10)	-	0.60 (0.010)	0.67 (0.010)	0.331 (0.10)	-	-	0.132 (0.012)	-	0.206 (0.012)	-	0.4 J (0.1)	0.29 (0.010)	**5.1 (0.10)**	0.61 (0.010)	ND (0.10) (0.012)	-	0.015 J (0.010)
Fluorene	µg/L	1900	49.5 (1.0)	-	43 (0.10)	39 (0.010)	1.41 (0.10)	-	-	1.08 (0.017)	-	1.74 (0.017)	-	2 (0.1)	1.9 (0.010)	51 (0.10)	27 (0.010)	ND (0.10) (0.017)	-	0.018 J (0.010)
Naphthalene	µg/L	100	25.3 (1.0)	-	22 (0.31)	5.4 (0.030)	ND (0.10) (0.10)	-	-	ND (0.1) (0.036)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	ND (0.061) (0.030)	1.4 (0.31)	ND (0.060) (0.030)	ND (0.10) (0.036)	-	0.082 (0.030)
Phenanthrene	µg/L	1100	54.4 (1.0)	-	53 (0.31)	5.1 (0.030)	0.496 (0.10)	-	-	0.43 (0.021)	-	0.333 (0.021)	-	0.4 J (0.1)	0.66 (0.030)	74 (0.31)	20 (0.030)	0.180 (0.021)	-	0.18 (0.030)
Pyrene	µg/L	130	3.88 (0.10)	-	4.7 (0.010)	5.7 (0.010)	3.00 (0.10)	-	-	1.13 (0.015)	-	2.51 (0.015)	-	3 (0.1)	2.3 (0.010)	19 (0.10)	3.4 (0.010)	ND (0.10) (0.015)	-	0.033 J (0.010)
Metals																				
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.5 (0.97)	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50) (0.59)	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37100 (24)	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5.8 (1.7)**	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	275 (0.40)	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.095)	-	-
Metals, Dissolved																				
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0 J (0.97)	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50) (0.59)	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28400 (24)	-
Lead	µg/L	5	-	ND (3.0) (3.0)	ND (1.0) (0.13)	ND (1.0) (0.09)	-	3.5 (3.0)	-	-	ND (3) (1.7)	-	1.6 J (1.3)	0.13 J (0.082)	ND (1.0) (0.13)	ND (1.0) (0.13)	0.12 J (0.090)	-	**6.4 (1.7)**	ND (1.0) (0.13)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	274 (0.40)	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.095)	-
General Chemistry																				
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	295000 (5000)	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	298000 (2800)	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75500 (48)	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170 B (5.1)	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24400 (1500)	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (110) (5.6)	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100) (4.6)	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10) (1)	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10000) (380)	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	410 B (280)	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6200 (240)	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	302000 (1800)	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-133					B-133D			B-134			B-134D								B-135	
Sample Date			9-Jan-13	9-Jan-13	5-May-16	25-Aug-16	25-Aug-16	29-Mar-13	29-Mar-13	3-May-16	9-Jan-13	9-Jan-13	11-May-16	5-Feb-13	5-Feb-13	5-Feb-13	5-Feb-13	1-Apr-13	1-Apr-13	3-May-16	3-May-16	9-Jan-13	9-Jan-13
Sample ID			B133_010913	B133_010913	GW-11109613-B133-05-05-16-RM-020	GW-11109613-B-133D-082416-AC-029	GW-11109613-B-133D-082416-AC-030	B-133D_32913	B-133D_32913	GW-11109613-B133D-05-03-16-RM-004	B134_010913	B134_010913	GW-11109613-B134-05-11-16-MM-041	B-134D_020513	B-134D_020513	B-134D_020513	B-134D_020513	B-134D_40113	B-134D_40113	GW-11109613-B134D-05-03-16-AC-001	GW-11109613-DUP1-05-03-16-AC-003	B135_010913	B135_010913
Sampling Company			UNKNOWN	UNKNOWN	GHD	GHD	GHD	LANGAN	LANGAN	GHD	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LANGAN	LANGAN	GHD	GHD	UNKNOWN	UNKNOWN
Laboratory			ACCUTEST	ACCUTEST	LL	LL	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST
Laboratory Work Order			JB26467	JB26467	1658374	1700681	1700681	JB32843	JB32843	1657425	JB26467	JB26467	1660120	JB28204	JB28204	JB28204R	JB28204R	JB32976	JB32976	1657425	1657425	JB26467	JB26467
Laboratory Sample ID	Units	MSC-PA	JB26467-1	JB26467-1F	8370275	8553522	8553523	JB32843-3	JB32843-3F	8365507	JB26467-2	JB26467-2F	8378037	JB28204-2	JB28204-2F	JB28204-2FR	JB28204-2R	JB32976-8	JB32976-8F	8365504	8365506	JB26467-3	JB26467-3F
Field Parameters																							
Conductivity	mS/cm	n/v	-	-	1.17	-	0.69	-	-	1.22	-	-	NM	-	-	-	-	-	-	0.698	0.698	-	-
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	0	-	0	-	-	0	-	-	NM	-	-	-	-	-	-	2.17	2.17	-	-
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-98	-	-140	-	-	-86	-	-	NM	-	-	-	-	-	-	-76	-76	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	6.46	-	6.51	-	-	6.11	-	-	NM	-	-	-	-	-	-	6.63	6.63	-	-
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	14.3	-	19.97	-	-	15.2	-	-	NM	-	-	-	-	-	-	14.95	14.95	-	-
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	14	-	50.8	-	-	69	-	-	NM	-	-	-	-	-	-	50.2	50.2	-	-
Volatile Organic Compounds																							
Benzene	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	2 (0.5)	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	2.9 (1.0)	-
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	-	-	-	-	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
Ethylbenzene	µg/L	700	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	1.9 (1.0)	-	ND (1) (0.5)	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	3.2 (1.0)	-
Isopropylbenzene (Cumene)	µg/L	3500	52.0 (2.0)	-	59 (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.45)	-	ND (2) (0.5)	67.8 (2.0)	-	100 (0.5)	-	-	-	-	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	33.6 (2.0)	-
Methyl Tertiary Butyl Ether	µg/L	20	3.2 (1.0)	-	1 (0.5)	ND (1) (0.5)	1 (0.5)	1.6 (0.16)	-	1 (0.5)	2.5 (1.0)	-	ND (1) (0.5)	-	-	-	-	1.8 (0.16)	-	2 (0.5)	1 (0.5)	ND (1.0) (1.0)	-
Toluene	µg/L	1000	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	0.6 J (0.5)	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	1.9 (1.0)	-
Total BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	3.6 (2.0)	-	0.7 J (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.19)	-	ND (2) (0.5)	4.7 (2.0)	-	ND (2) (0.5)	-	-	-	-	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	4.3 (2.0)	-
1,3,5-Trimethylbenzene	µg/L	1200	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.36)	-	ND (2) (0.5)	2.0 (2.0)	-	0.7 J (0.5)	-	-	-	-	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	2.0 (2.0)	-
Xylenes, Total (Dimethylbenzene)	µg/L	10000	9.1 (1.0)	-	2 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	11.2 (1.0)	-	0.5 J (0.5)	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	17.7 (1.0)	-
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.029) (0.010)	ND (0.020) (0.011)	-	ND (0.029) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	-	-	-	-	ND (0.020) (0.011)	-	ND (0.029) (0.0095)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-
Semi-Volatile Organic Compounds																							
Anthracene	µg/L	66	5.66 (1.0)	-	11 (0.10)	ND (0.050) (0.010)	0.18 (0.010)	0.133 (0.020)	-	0.18 (0.010)	5.26 (1.0)	-	2.0 (0.010)	-	-	-	-	ND (0.10) (0.020)	-	0.069 (0.010)	0.039 J (0.010)	9.34 (1.0)	-
Benzo(a)Anthracene	µg/L	4.9	0.866 (0.10)	-	1.7 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.10) (0.012)	-	0.024 J (0.010)	0.148 (0.10)	-	0.46 (0.010)	-	-	-	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	0.011 J (0.010)	**7.94 (1.0)**	-
Benzo(a)Pyrene	µg/L	0.2	**0.245 (0.10)**	-	**0.72 (0.10)**	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.10) (0.012)	-	0.017 J (0.010)	ND (0.10) (0.10)	-	**0.25 (0.010)**	-	-	-	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	0.012 J (0.010)	**4.02 (0.10)**	-
Benzo(b)Fluoranthene	µg/L	1.2	0.193 (0.10)	-	0.81 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.10) (0.010)	-	0.015 J (0.010)	ND (0.10) (0.10)	-	0.30 (0.010)	-	-	-	-	ND (0.10) (0.010)	-	ND (0.051) (0.010)	0.013 J (0.010)	**4.35 (0.10)**	-
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.10)	-	0.23 J (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.10) (0.016)	-	0.010 J (0.010)	ND (0.10) (0.10)	-	0.075 (0.010)	-	-	-	-	ND (0.10) (0.016)	-	ND (0.051) (0.010)	0.017 J (0.010)	**1.46 (0.10)**	-
Chrysene	µg/L	1.9	0.663 (0.10)	-	1.3 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.10) (0.012)	-	0.021 J (0.010)	0.121 (0.10)	-	0.39 (0.010)	-	-	-	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.051) (0.010)	**4.87 (0.10)**	-
Fluorene	µg/L	1900	26.4 (1.0)	-	33 (0.10)	ND (0.050) (0.010)	0.014 J (0.010)	ND (0.10) (0.017)	-	0.030 J (0.010)	31.9 (1.0)	-	8.7 (0.010)	-	-	-	-	ND (0.10) (0.017)	-	0.012 J (0.010)	0.011 J (0.010)	37.6 (1.0)	-
Naphthalene	µg/L	100	1.41 (0.10)	-	ND (0.61) (0.30)	0.039 J (0.030)	ND (0.060) (0.030)	ND (0.10) (0.036)	-	ND (0.060) (0.030)	0.964 (0.10)	-	ND (0.062) (0.031)	-	-	-	-	ND (0.10) (0.036)	-	ND (0.061) (0.030)	ND (0.061) (0.030)	1.86 (0.10)	-
Phenanthrene	µg/L	1100	32.7 (1.0)	-	56 (0.30)	ND (0.060) (0.030)	0.55 (0.030)	0.415 (0.021)	-	0.49 (0.030)	29.0 (1.0)	-	7.1 (0.031)	-	-	-	-	0.162 (0.021)	-	0.27 (0.030)	0.27 (0.030)	32.7 (1.0)	-
Pyrene	µg/L	130	4.45 (0.10)	-	7.4 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.10) (0.015)	-	0.047 J (0.010)	1.93 (0.10)	-	1.8 (0.010)	-	-	-	-	ND (0.10) (0.015)	-	0.017 J (0.010)	0.020 J (0.010)	19.6 (1.0)	-
Metals																							
Arsenic	µg/L	10	-	-	-	-	-	**10.2 (0.97)**	-	-	-	-	-	ND (3.0) (3.0)	-	-	-	5.5 (0.97)	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	1.1 J (0.59)	-	-	-	-	-	ND (50) (50)	-	-	-	ND (50) (0.59)	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	35600 (24)	-	-	-	-	-	27600 (100)	-	-	-	33300 (24)	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-	**8.5 (1.7)**	-	-	-	-	-	ND (3.0) (3.0)	-	-	-	**7.3 (1.7)**	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-	249 (0.40)	-	-	-	-	-	284 (15)	-	-	-	238 (0.40)	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	ND (0.20) (0.095)	-	-	-	-	-	-	-	-	ND (0.20) (0.20)	ND (0.20) (0.089)	-	-	-	-	-
Metals, Dissolved																							
Arsenic	µg/L	10	-	-	-	-	-	-	5.6 (0.97)	-	-	-	-	-	ND (3.0) (3.0)	-	-	-	2.0 J (0.97)	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	0.80 J (0.59)	-	-	-	-	-	ND (50) (50)	-	-	-	0.90 J (0.59)	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	24600 (24)	-	-	-	-	-	22000 (100)	-	-	-	9890 (24)	-	-	-	-
Lead	µg/L	5	-	ND (3.0) (3.0)	ND (1.0) (0.13)	0.48 J (0.090)	ND (1.0) (0.090)	-	**6.0 (1.7)**	1.4 (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	-	-	-	**6.6 (1.7)**	0.14 J (0.13)	0.14 J (0.13)	-	ND (3.0) (3.0)
Manganese	µg/L	300	-	-	-	-	-	-	229 (0.40)	-	-	-	-	-	**1850 (15)**	-	-	-	219 (0.40)	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	ND (0.20) (0.095)	-	-	-	-	-	-	ND (0.20) (0.20)	-	-	ND (0.20) (0.089)	-	-	-	-
General Chemistry																							
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	286000 (5000)	-	-	-	-	-	-	-	-	-	416000 (5000)	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	287000 (2800)	-	-	-	-	-	-	-	-	-	417000 (3500)	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	89600 (48)	-	-	-	-	-	-	-	-	-	56800 (48)	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-	160 B (5.1)	-	-	-	-	-	-	-	-	-	160 B (5.1)	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	26600 (1500)	-	-	-	-	-	-	-	-	-	**31700 (1600)**	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	ND (110) (5.6)	-	-	-	-	-	-	-	-	-	19 B (5.6)	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	ND (100) (4.6)	-	-	-	-	-	-	-	-	-	19 B (4.6)	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	ND (10) (1)	-	-	-	-	-	-	-	-	-	ND (10) (1)	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	ND (10000) (380)	-	-	-	-	-	-	-	-	-	ND (10000) (380)	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	680 B (280)	-	-	-	-	-	-	-	-	-	540 B (280)	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	6300 (240)	-	-	-	-	-	-	-	-	-	5900 (240)	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	367000 (1800)	-	-	-	-	-	-	-	-	-	285000 (1800)	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-144			B-145				B-149		B-150		B-151		B-152				B-153		
Sample Date			8-Jan-13	8-Jan-13	11-May-16	8-Jan-13	8-Jan-13	9-May-16	24-Aug-16	7-Jan-13	7-Jan-13	11-May-16	24-Aug-16	7-Jan-13	7-Jan-13	7-Jan-13	7-Jan-13	9-May-16	9-May-16	4-Jan-13	4-Jan-13	4-May-16
Sample ID			B144_010813	B144_010813	GW-11109613-B144-05-11-16-AC-044	B145_010813	B145_010813	GW-11109613-B145-05-09-16-AC-029	GW-11109613-B-145-082416-KC-016	B-149_010713	B-149_010713	GW-11109613-B150-05-11-16-AC-046	GW-11109613-B-150-082416-AC-019	B-151_010713	B-151_010713	B-152_010713	B-152_010713	GW-11109613-B152-05-09-16-AC-025	GW-11109613-DUP3-05-09-16-AC-027	B-153_010413	B-153_010413	GW-11109613-B153-05-04-16-RM-010
Sampling Company			UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	GHD
Laboratory			ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	LL
Laboratory Work Order			JB25963	JB25963	1660120	JB25963	JB25963	1659064	1700681	JB25835	JB25835	1660120	1700681	JB25835	JB25835	JB25835	JB25835	1659064	1659064	JB25728	JB25728	1657425
Laboratory Sample ID	Units	MSC-PA	JB25963-2	JB25963-2F	8378040	JB25963-3	JB25963-3F	8373134	8553508	JB25835-2	JB25835-2F	8378042	8553511	JB25835-3	JB25835-3F	JB25835-4	JB25835-4F	8373130	8373132	JB25728-4	JB25728-4F	8365513
Field Parameters																						
Conductivity	mS/cm	n/v	-	-	NM	-	-	0.272	0.24	-	-	NM	-	-	-	-	-	0.433	0.433	-	-	1.17
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	NM	-	-	2.38	3.06	-	-	NM	-	-	-	-	-	1.96	1.96	-	-	0.41
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	NM	-	-	-120	-169	-	-	NM	-	-	-	-	-	-108	-108	-	-	-38
pH, FIELD MEASURED	S.U.	n/v	-	-	NM	-	-	7.28	7.35	-	-	NM	-	-	-	-	-	6.69	6.69	-	-	6.8
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	NM	-	-	16.32	23.4	-	-	NM	-	-	-	-	-	15.65	15.65	-	-	13.9
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	NM	-	-	17.5	0	-	-	NM	-	-	-	-	-	12.1	12.1	-	-	0
Volatile Organic Compounds																						
Benzene	µg/L	5	77.5 (1.0)	-	130 (3)	18.0 (1.0)	-	6 (0.5)	6 (0.5)	47400 (500)	-	480000 (10000)	320000 (0.5)	15.2 (1.0)	-	38.8 (1.0)	-	42 (0.5)	39 (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (5) (3)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (200) (200)	-	ND (200) (100)	ND (50) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)
Ethylbenzene	µg/L	700	101 (1.0)	-	260 (3)	2.3 (1.0)	-	1 (0.5)	1 (0.5)	ND (200) (200)	-	320 (100)	270 (0.5)	1.3 (1.0)	-	3.5 (1.0)	-	3 (0.5)	3 (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)
Isopropylbenzene (Cumene)	µg/L	3500	60.0 (2.0)	-	35 (3)	58.8 (2.0)	-	77 (0.5)	74 (0.5)	1750 (400)	-	12000 (100)	7500 (0.5)	15.6 (2.0)	-	104 (2.0)	-	120 (0.5)	110 (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)
Methyl Tertiary Butyl Ether	µg/L	20	ND (1.0) (1.0)	-	ND (5) (3)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (200) (200)	-	ND (200) (100)	ND (50) (0.5)	ND (1.0) (1.0)	-	1.6 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)
Toluene	µg/L	1000	35.6 (1.0)	-	74 (3)	2.9 (1.0)	-	2 (0.5)	2 (0.5)	357 (200)	-	55000 (1000)	33000 (0.5)	4.4 (1.0)	-	16.8 (1.0)	-	16 (0.5)	15 (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)
Total BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	212 (10)	-	460 (3)	2.9 (2.0)	-	1 J (0.5)	1 J (0.5)	ND (400) (400)	-	ND (400) (100)	76 J (0.5)	ND (2.0) (2.0)	-	6.0 (2.0)	-	5 (0.5)	4 (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)
1,3,5-Trimethylbenzene	µg/L	1200	64.4 (2.0)	-	140 (3)	2.0 (2.0)	-	1 J (0.5)	2 J (0.5)	ND (400) (400)	-	ND (400) (100)	31 J (0.5)	ND (2.0) (2.0)	-	4.7 (2.0)	-	3 (0.5)	3 (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)
Xylenes, Total (Dimethylbenzene)	µg/L	10000	506 (5.0)	-	1600 (3)	8.1 (1.0)	-	6 (0.5)	6 (0.5)	ND (200) (200)	-	1400 (100)	1100 (0.5)	6.2 (1.0)	-	29.0 (1.0)	-	28 (0.5)	25 (0.5)	1.4 (1.0)	-	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																						
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.020) (0.020)	-	ND (0.030) (0.0099)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.029) (0.0097)	ND (0.020) (0.020)	-	ND (0.029) (0.0095)
Semi-Volatile Organic Compounds																						
Anthracene	µg/L	66	0.270 (0.10)	-	5.4 (0.10)	4.92 (0.10)	-	7.4 (0.010)	13 (0.010)	1.33 (0.10)	-	0.86 (0.10)	0.15 J (0.010)	0.522 (0.10)	-	1.41 (0.10)	-	2.6 (0.010)	2.1 (0.010)	0.190 (0.10)	-	0.099 (0.010)
Benzo(a)Anthracene	µg/L	4.9	ND (0.10) (0.10)	-	2.0 (0.10)	0.397 (0.10)	-	0.68 (0.010)	0.67 (0.010)	0.193 (0.10)	-	0.52 (0.10)	0.10 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.12 (0.010)	0.14 (0.010)	ND (0.10) (0.10)	-	0.052 (0.010)
Benzo(a)Pyrene	µg/L	0.2	ND (0.10) (0.10)	-	1.2 (0.10)	0.141 (0.10)	-	0.33 (0.010)	0.22 (0.010)	0.122 (0.10)	-	0.40 J (0.10)	ND (0.50) (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.088 (0.010)	0.11 (0.010)	ND (0.10) (0.10)	-	0.038 J (0.010)
Benzo(b)Fluoranthene	µg/L	1.2	ND (0.10) (0.10)	-	1.6 (0.10)	0.137 (0.10)	-	0.36 (0.010)	0.24 (0.010)	ND (0.10) (0.10)	-	0.53 (0.10)	ND (0.50) (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.11 (0.010)	0.13 (0.010)	ND (0.10) (0.10)	-	0.040 J (0.010)
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.10)	-	0.42 J (0.10)	ND (0.10) (0.10)	-	0.11 (0.010)	0.071 (0.010)	ND (0.10) (0.10)	-	0.22 J (0.10)	ND (0.50) (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.058 (0.010)	0.081 (0.010)	ND (0.10) (0.10)	-	0.018 J (0.010)
Chrysene	µg/L	1.9	ND (0.10) (0.10)	-	2.0 (0.10)	0.341 (0.10)	-	0.47 (0.010)	0.49 (0.010)	0.141 (0.10)	-	0.53 (0.10)	ND (0.50) (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.13 (0.010)	0.14 (0.010)	ND (0.10) (0.10)	-	0.058 (0.010)
Fluorene	µg/L	1900	2.14 (0.10)	-	1.1 (0.10)	19.4 (1.0)	-	34 (0.10)	50 (0.010)	4.66 (0.10)	-	2.8 (0.10)	0.90 (0.010)	1.64 (0.10)	-	4.72 (0.10)	-	2.3 (0.010)	2.3 (0.010)	0.192 (0.10)	-	0.018 J (0.010)
Naphthalene	µg/L	100	4.01 (0.10)	-	19 (0.30)	3.40 (0.10)	-	4.4 (0.030)	3.3 (0.030)	27.7 (1.0)	-	52 (0.31)	31 (0.030)	0.453 (0.10)	-	1.46 (0.10)	-	ND (0.060) (0.030)	ND (0.061) (0.030)	0.466 (0.10)	-	ND (0.061) (0.030)
Phenanthrene	µg/L	1100	0.917 (0.10)	-	6.6 (0.30)	11.7 (1.0)	-	23 (0.30)	41 (0.030)	7.35 (1.0)	-	4.5 (0.31)	1.2 (0.030)	0.114 (0.10)	-	2.30 (0.10)	-	4.9 (0.030)	3.8 (0.030)	ND (0.10) (0.10)	-	0.043 J (0.030)
Pyrene	µg/L	130	0.123 (0.10)	-	4.3 (0.10)	2.79 (0.10)	-	4.2 (0.010)	5.4 (0.010)	1.01 (0.10)	-	0.93 (0.10)	0.15 J (0.010)	0.433 (0.10)	-	1.04 (0.10)	-	1.5 (0.010)	1.6 (0.010)	0.213 (0.10)	-	0.27 (0.010)
Metals																						
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																						
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	4.2 (3.0)	0.24 J (0.13)	-	3.7 (3.0)	0.70 J (0.13)	0.13 J (0.090)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	0.12 J (0.090)	-	ND (3.0) (3.0)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																						
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-154			B-155			B-156			B-158										B-160	
Sample Date			7-Jan-13	7-Jan-13	10-May-16	7-Jan-13	7-Jan-13	5-May-16	7-Jan-13	7-Jan-13	10-May-16	7-Jan-13	7-Jan-13	8-Apr-13	8-Apr-13	8-Apr-13	2-Jun-14	2-Jun-14	20-May-15	9-May-16	22-Aug-16	7-Jan-13	7-Jan-13
Sample ID			B-154_010713	B-154_010713	GW-11109613-B154-05-10-16-MM-038	B-155_010713	B-155_010713	GW-11109613-B155-05-05-16-AC-013	B-156_010713	B-156_010713	GW-11109613-B154-05-10-16-MM-036	B-158_010713	B-158_010713	B-158	B-158_040813	B-158_040813	B-158	B-158	B-158_20150520	GW-11109613-B158-05-09-16-AC-033	GW-11109613-B-158-082216-AC-002	B160_010713	B160_010713
Sampling Company			UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	GHD	GHD	UNKNOWN	UNKNOWN
Laboratory			ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	ACCUTEST	ACCUTEST
Laboratory Work Order			JB25835	JB25835	1660120	JB25835	JB25835	1658374	JB25835	JB25835	1660120	JB25835	JB25835	20140718EZ	JB33644	JB33644	JB68336	JB68336	1562821	1659064	1699628	JB25834	JB25834
Laboratory Sample ID	Units	MSC-PA	JB25835-5	JB25835-5F	8378043	JB25835-6	JB25835-6F	8370268	JB25835-7	JB25835-7F	8378032	JB25835-8	JB25835-8F	UNKNOWN	JB33644-14	JB33644-14F	JB68336-15	JB68336-15F	7896251	8373138	8548678	JB25834-4	JB25834-4F
Field Parameters																							
Conductivity	mS/cm	n/v	-	-	0.246	-	-	0.593	-	-	0.629	-	-	-	-	-	-	-	-	0.376	0.4	-	-
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	2.46	-	-	2.56	-	-	19.15	-	-	-	-	-	-	-	2.01	6.95	1.68	-	-
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-71	-	-	-70	-	-	-90	-	-	-	-	-	-	-	52	-70	-88	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	7.21	-	-	6.56	-	-	6.93	-	-	-	-	-	-	-	8.04	7.65	7.59	-	-
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.479	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	13.21	-	-	15.61	-	-	14.02	-	-	-	-	-	-	-	14.94	15.33	26.06	-	-
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-
Turbidity	NTU	n/v	-	-	0	-	-	57.3	-	-	284	-	-	-	-	-	-	-	141	15.5	0	-	-
Volatile Organic Compounds																							
Benzene	µg/L	5	238000 (5000)	-	51000 (1000)	77800 (500)	-	120000 (1000)	301 (5.0)	-	49 (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.24)	-	ND (0.50) (0.21)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
1,2-Dichloroethane (EDC)	µg/L	5	ND (1000) (1000)	-	ND (200) (100)	ND (500) (500)	-	ND (50) (25)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
Ethylbenzene	µg/L	700	ND (1000) (1000)	-	ND (200) (100)	ND (500) (500)	-	120 (25)	5.5 (1.0)	-	4 (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.23)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	4.1 (1.0)	-
Isopropylbenzene (Cumene)	µg/L	3500	ND (2000) (2000)	-	150 J (100)	ND (1000) (1000)	-	79 J (25)	101 (2.0)	-	120 (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.45)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	2.9 (2.0)	-
Methyl Tertiary Butyl Ether	µg/L	20	ND (1000) (1000)	-	ND (200) (100)	ND (500) (500)	-	ND (50) (25)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.16)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
Toluene	µg/L	1000	1100 (1000)	-	180 J (100)	ND (500) (500)	-	820 (25)	21.0 (1.0)	-	13 (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.23)	-	ND (1.0) (0.22)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	1.7 (1.0)	-
Total BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	ND	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	ND (2000) (2000)	-	ND (400) (100)	ND (1000) (1000)	-	62 J (25)	5.5 (2.0)	-	4 (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	7.9 (2.0)	-
1,3,5-Trimethylbenzene	µg/L	1200	ND (2000) (2000)	-	ND (400) (100)	ND (1000) (1000)	-	ND (100) (25)	5.6 (2.0)	-	5 (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	2.2 (2.0)	-
Xylenes, Total (Dimethylbenzene)	µg/L	10000	ND (1000) (1000)	-	ND (200) (100)	ND (500) (500)	-	150 (25)	33.2 (1.0)	-	22 (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.24)	-	ND (1.0) (0.20)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	15.3 (1.0)	-
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.020) (0.020)	-	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-	ND (0.0095) (0.010)	ND (0.029) (0.0096)	ND (0.028) (0.010)	ND (0.020) (0.020)	-
Semi-Volatile Organic Compounds																							
Anthracene	µg/L	66	3.10 (0.10)	-	1.5 (0.010)	1.74 (0.10)	-	3.7 (0.010)	1.79 (0.10)	-	4.7 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.02)	-	ND (0.10) (0.020)	-	ND (0.1) (0.1)	0.027 J (0.010)	0.037 J (0.010)	ND (10) (10)	-
Benzo(a)Anthracene	µg/L	4.9	ND (0.10) (0.10)	-	0.12 (0.010)	ND (0.10) (0.10)	-	0.31 (0.010)	0.184 (0.10)	-	1.7 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.058 (0.010)	0.055 (0.010)	ND (10) (10)	-
Benzo(a)Pyrene	µg/L	0.2	ND (0.10) (0.10)	-	0.10 (0.010)	ND (0.10) (0.10)	-	0.25 (0.010)	ND (0.10) (0.10)	-	1.4 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.045 J (0.010)	0.042 J (0.010)	ND (10) (10)	-
Benzo(b)Fluoranthene	µg/L	1.2	ND (0.10) (0.10)	-	0.084 (0.010)	ND (0.10) (0.10)	-	0.24 (0.010)	ND (0.10) (0.10)	-	1.5 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.01)	-	ND (0.10) (0.010)	-	ND (0.1) (0.1)	0.051 (0.010)	0.046 J (0.010)	ND (10) (10)	-
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.10)	-	0.054 (0.010)	ND (0.10) (0.10)	-	0.088 (0.010)	ND (0.10) (0.10)	-	0.50 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.016)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	0.029 J (0.010)	0.027 J (0.010)	ND (10) (10)	-
Chrysene	µg/L	1.9	ND (0.10) (0.10)	-	0.099 (0.010)	ND (0.10) (0.10)	-	0.27 (0.010)	0.161 (0.10)	-	1.4 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.051 (0.010)	0.045 J (0.010)	ND (10) (10)	-
Fluorene	µg/L	1900	15.8 (1.0)	-	7.0 (0.010)	6.74 (1.0)	-	6.6 (0.010)	8.16 (1.0)	-	10 (0.010)	ND (0.10) (0.10)	-	-	ND (0.1) (0.017)	-	ND (0.10) (0.017)	-	ND (0.1) (0.1)	0.064 (0.010)	0.094 (0.010)	ND (10) (10)	-
Naphthalene	µg/L	100	57.3 (1.0)	-	20 (0.31)	52.4 (1.0)	-	42 (0.61)	1.65 (0.10)	-	3.3 (0.031)	0.155 (0.10)	-	-	ND (0.1) (0.036)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	0.042 J (0.030)	0.078 (0.030)	ND (10) (10)	-
Phenanthrene	µg/L	1100	17.0 (1.0)	-	4.9 (0.031)	8.73 (1.0)	-	12 (0.61)	9.87 (1.0)	-	17 (0.31)	ND (0.10) (0.10)	-	-	ND (0.1) (0.021)	-	ND (0.10) (0.021)	-	ND (0.1) (0.1)	0.040 J (0.030)	0.043 J (0.030)	ND (10) (10)	-
Pyrene	µg/L	130	0.983 (0.10)	-	0.51 (0.010)	0.746 (0.10)	-	1.3 (0.010)	0.883 (0.10)	-	3.4 (0.010)	0.196 (0.10)	-	-	ND (0.1) (0.015)	-	0.126 (0.015)	-	0.2 J (0.1)	0.22 (0.010)	0.31 (0.010)	ND (10) (10)	-
Metals																							
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																							
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	-	-	ND (3) (1.7)	-	1.7 J (1.3)	0.14 J (0.082)	1.2 (0.13)	0.89 J (0.09)	-	ND (3.0) (3.0)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																							
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-162			B-163			B-164				B-165						B-166		B-167	
Sample Date			4-Jan-13	4-Jan-13	10-May-16	7-Jan-13	7-Jan-13	10-May-16	8-Jan-13	8-Jan-13	9-May-16	23-Aug-16	4-Jan-13	4-Jan-13	3-Jun-14	3-Jun-14	20-May-15	5-May-16	7-Jan-13	7-Jan-13	7-Jan-13	7-Jan-13
Sample ID			B162_010413	B162_010413	GW-11109613-B162-05-10-16-AC-039	B-163_010713	B-163_010713	GW-11109613-B163-05-10-16-AC-037	B164_010813	B164_010813	GW-11109613-B164-05-09-16-AC-031	GW-11109613-B-164-082316-KC-014	B-165_010413	B-165_010413	B-165	B-165	B-165_20150520	GW-11109613-B165-05-05-16-AC-015	B166_010713	B166_010713	B167_010713	B167_010713
Sampling Company			UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory			ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order			JB25729	JB25729	1660120	JB25835	JB25835	1660120	JB25964	JB25964	1659064	1699628	JB25728	JB25728	JB68336	JB68336	1562821	1658374	JB25834	JB25834	JB25834	JB25834
Laboratory Sample ID	Units	MSC-PA	JB25729-3	JB25729-3F	8378035	JB25835-9	JB25835-9F	8378033	JB25964-3	JB25964-3F	8373136	8548691	JB25728-1	JB25728-1F	JB68336-19	JB68336-19F	7896252	8370270	JB25834-2	JB25834-2F	JB25834-3	JB25834-3F
Field Parameters																						
Conductivity	mS/cm	n/v	-	-	0.658	-	-	0.391	-	-	0.406	0.48	-	-	-	-	-	0.687	-	-	-	-
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	33.3	-	-	26.08	-	-	10.51	15.59	-	-	-	-	1.12	1.1	-	-	-	-
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-74	-	-	-83	-	-	120	53	-	-	-	-	-115	-122	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	6.31	-	-	6.92	-	-	7.74	7.33	-	-	-	-	7.79	7.07	-	-	-	-
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	14.49	-	-	17.36	-	-	15.53	21.5	-	-	-	-	18.25	15.68	-	-	-	-
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.663	-	-	-	-	-
Turbidity	NTU	n/v	-	-	90.1	-	-	0	-	-	105	20.6	-	-	-	-	32.4	23.4	-	-	-	-
Volatile Organic Compounds																						
Benzene	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	**373 (5.0)**	-	0.9 J (0.5)	**99.1 (1.0)**	-	ND (1) (0.5)	1 (0.5)	ND (1.0) (1.0)	-	ND (0.50) (0.21)	-	ND (0.5) (0.5)	4 (0.5)	ND (1.0) (1.0)	-	**10.2 (1.0)**	-
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-
Ethylbenzene	µg/L	700	1.7 (1.0)	-	ND (1) (0.5)	1.8 (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (1) (0.5)	1.1 (1.0)	-	3.9 (1.0)	-
Isopropylbenzene (Cumene)	µg/L	3500	ND (2.0) (2.0)	-	ND (2) (0.5)	3.5 (2.0)	-	ND (2) (0.5)	7.2 (2.0)	-	5 (0.5)	5 (0.5)	3.0 (2.0)	-	3.4 (0.26)	-	6 (0.5)	5 (0.5)	2.1 (2.0)	-	81.6 (2.0)	-
Methyl Tertiary Butyl Ether	µg/L	20	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	0.34 J (0.26)	-	0.6 J (0.5)	2 (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-
Toluene	µg/L	1000	ND (1.0) (1.0)	-	ND (1) (0.5)	6.4 (1.0)	-	ND (1) (0.5)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.22)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	4.5 (1.0)	-
Total BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	3.3 (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	0.23 J (0.19)	-	ND (0.5) (0.5)	ND (2) (0.5)	2.3 (2.0)	-	4.0 (2.0)	-
1,3,5-Trimethylbenzene	µg/L	1200	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-
Xylenes, Total (Dimethylbenzene)	µg/L	10000	6.3 (1.0)	-	ND (1) (0.5)	3.5 (1.0)	-	ND (1) (0.5)	1.2 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.20)	-	ND (0.5) (0.5)	ND (1) (0.5)	3.9 (1.0)	-	17.4 (1.0)	-
Volatile Organic Compounds (SW8011)																						
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.020) (0.020)	-	ND (0.020) (0.011)	-	ND (0.0096) (0.010)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-
Semi-Volatile Organic Compounds																						
Anthracene	µg/L	66	ND (1.0) (1.0)	-	0.62 (0.010)	0.156 (0.10)	-	0.044 J (0.010)	ND (0.10) (0.10)	-	0.026 J (0.010)	0.057 (0.010)	0.790 (0.10)	-	0.416 (0.020)	-	0.6 (0.1)	0.48 (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-
Benzo(a)Anthracene	µg/L	4.9	ND (1.0) (1.0)	-	0.41 (0.010)	ND (0.10) (0.10)	-	0.097 (0.010)	ND (0.10) (0.10)	-	0.027 J (0.010)	0.017 J (0.010)	0.223 (0.10)	-	0.196 (0.012)	-	0.2 J (0.1)	0.17 (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-
Benzo(a)Pyrene	µg/L	0.2	ND (1.0) (1.0)	-	**0.32 (0.010)**	ND (0.10) (0.10)	-	0.090 (0.010)	ND (0.10) (0.10)	-	0.047 J (0.010)	0.019 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.039 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-
Benzo(b)Fluoranthene	µg/L	1.2	ND (1.0) (1.0)	-	0.34 (0.010)	ND (0.10) (0.10)	-	0.17 (0.010)	ND (0.10) (0.10)	-	0.049 J (0.010)	0.021 J (0.010)	ND (0.10) (0.10)	-	0.124 (0.010)	-	0.1 J (0.1)	0.050 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-
Benzo(g,h,i)Perylene	µg/L	0.26	ND (1.0) (1.0)	-	0.17 (0.010)	ND (0.10) (0.10)	-	0.064 (0.010)	ND (0.10) (0.10)	-	0.035 J (0.010)	0.018 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	0.025 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-
Chrysene	µg/L	1.9	ND (1.0) (1.0)	-	0.47 (0.010)	ND (0.10) (0.10)	-	0.13 (0.010)	ND (0.10) (0.10)	-	0.027 J (0.010)	0.013 J (0.010)	0.148 (0.10)	-	0.134 (0.012)	-	0.2 J (0.1)	0.13 (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-
Fluorene	µg/L	1900	1.51 (1.0)	-	1.4 (0.010)	8.24 (1.0)	-	1.2 (0.010)	0.184 (0.10)	-	0.081 (0.010)	0.069 (0.010)	2.03 (0.10)	-	1.67 (0.017)	-	2 (0.1)	1.4 (0.010)	0.420 (0.10)	-	0.316 (0.10)	-
Naphthalene	µg/L	100	ND (1.0) (1.0)	-	0.61 (0.030)	0.491 (0.10)	-	ND (0.061) (0.031)	0.304 (0.10)	-	ND (0.062) (0.031)	0.037 J (0.030)	1.29 (0.10)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	ND (0.063) (0.031)	0.438 (0.10)	-	2.08 (0.10)	-
Phenanthrene	µg/L	1100	ND (1.0) (1.0)	-	0.56 (0.030)	0.170 (0.10)	-	0.037 J (0.031)	ND (0.10) (0.10)	-	ND (0.062) (0.031)	0.045 J (0.030)	0.446 (0.10)	-	0.223 (0.021)	-	0.1 J (0.1)	0.37 (0.031)	ND (0.10) (0.10)	-	0.289 (0.10)	-
Pyrene	µg/L	130	ND (1.0) (1.0)	-	1.1 (0.010)	0.177 (0.10)	-	0.27 (0.010)	0.123 (0.10)	-	0.043 J (0.010)	0.047 J (0.010)	1.65 (0.10)	-	1.14 (0.015)	-	2 (0.1)	1.2 (0.010)	0.135 (0.10)	-	ND (0.10) (0.10)	-
Metals																						
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																						
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	ND (3.0) (3.0)	0.31 J (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	1.1 (0.13)	1.9 (0.09)	-	ND (3.0) (3.0)	-	1.4 J (1.3)	0.11 J (0.082)	1.0 (0.13)	-	ND (3.0) (3.0)	-	ND (3.0) (3.0)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																						
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-168			B-169						B-170			B-172			B-173		B-174		B-175	
Sample Date			4-Jan-13	4-Jan-13	4-May-16	4-Jan-13	4-Jan-13	9-Jan-13	9-Jan-13	9-May-16	22-Aug-16	5-May-16	5-May-16	22-Aug-16	5-May-16	23-Aug-16	23-Aug-16	5-May-16	23-Aug-16	5-May-16	22-Aug-16	11-May-16	23-Aug-16
Sample ID			B-168_010413	B-168_010413	GW-11109613-B168-05-04-16-AC-009	B-169_010413	B-169_010413	B-169_010913	B-169_010913	GW-11109613-B169-05-09-16-MM-024	GW-11109613-B-169-082216-KC-001	GW-11109613-B170-05-05-16-AC-017	GW-11109613-DUP2-05-05-16-AC-019	GW-11109613-B-170-082216-KC-003	GW-11109613-B172-05-05-16-AC-021	GW-11109613-B-172-082316-AC-009	GW-11109613-B-172D-082316-AC-011	GW-11109613-B173-05-05-16-RM-018	GW-11109613-B-173-082316-KC-012	GW-11109613-B174-05-05-16-RM-016	GW-11109613-B-174-082216-KC-007	GW-11109613-B175-05-11-16-MM-045	GW-11109613-B-175-082316-AC-015
Sampling Company			UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory			ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order			JB25728	JB25728	1657425	JB25728	JB25728	JB26465	JB26465	1659064	1699628	1658374	1658374	1699628	1658374	1699628	1699628	1658374	1699628	1658374	1699628	1660120	1699628
Laboratory Sample ID	Units	MSC-PA	JB25728-2	JB25728-2F	8365512	JB25728-3	JB25728-3F	JB26465-4	JB26465-4F	8373129	8548677	8370272	8370274	8548679	8370276	8548686	8548688	8370273	8548689	8370271	8548683	8378041	8548692
Field Parameters																							
Conductivity	mS/cm	n/v	-	-	0.472	-	-	-	-	0.317	0.58	0.596	0.596	0.55	418	0.45	0.45	1.64	1.56	1.57	1.66	NM	-
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	9.68	-	-	-	-	19.8	14.4	1.17	1.17	6.44	2.38	4.72	4.72	0	1.61	0	3.26	NM	-
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-67	-	-	-	-	-135	-207	-125	-125	-157	-25	-99	-99	-96	-146	-92	-133	NM	-
pH, FIELD MEASURED	S.U.	n/v	-	-	7.35	-	-	-	-	7.11	6.75	8.27	8.27	6.76	7.2	7.07	7.07	6.47	6.61	7.02	6.85	NM	-
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	13.65	-	-	-	-	14.25	21.8	14.25	14.25	21.7	13.44	24.7	24.7	13	20.7	12.6	24.6	NM	-
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	13.1	-	-	-	-	14	8.9	0	0	9.4	26.6	10.9	10.9	130	0	2	49.2	NM	-
Volatile Organic Compounds																							
Benzene	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	**5.2 (1.0)**	-	**6.4 (1.0)**	-	0.7 J (0.5)	ND (1) (0.5)	5 (0.5)	5 (0.5)	3 (0.5)	**13 (0.5)**	**160 (0.5)**	**160 (0.5)**	**14 (5)**	**17 (0.5)**	ND (1) (0.5)	ND (1) (0.5)	**260 (3)**	**65 (0.5)**
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (3)	ND (1) (0.5)
Ethylbenzene	µg/L	700	ND (1.0) (1.0)	-	ND (1) (0.5)	1.8 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	4 (0.5)	ND (1) (0.5)	ND (1) (0.5)	25 (3)	5 (0.5)
Isopropylbenzene (Cumene)	µg/L	3500	3.8 (2.0)	-	2 J (0.5)	8.3 (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	6 (0.5)	5 (0.5)	5 (0.5)	7 (0.5)	ND (10) (0.5)	ND (10) (0.5)	27 (5)	33 (0.5)	ND (2) (0.5)	ND (2) (0.5)	150 (3)	63 (0.5)
Methyl Tertiary Butyl Ether	µg/L	20	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	ND (1) (0.5)	5 (0.5)	7 (0.5)	ND (5) (3)	ND (1) (0.5)
Toluene	µg/L	1000	ND (1.0) (1.0)	-	ND (1) (0.5)	2.0 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	5 J (5)	5 (0.5)	ND (1) (0.5)	ND (1) (0.5)	70 (3)	15 (0.5)
Total BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	ND (2.0) (2.0)	-	ND (2) (0.5)	4.7 (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (10) (0.5)	ND (10) (0.5)	ND (20) (5)	5 (0.5)	ND (2) (0.5)	ND (2) (0.5)	4 J (3)	2 J (0.5)
1,3,5-Trimethylbenzene	µg/L	1200	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (10) (0.5)	ND (10) (0.5)	13 J (5)	14 (0.5)	ND (2) (0.5)	ND (2) (0.5)	51 (3)	10 (0.5)
Xylenes, Total (Dimethylbenzene)	µg/L	10000	2.0 (1.0)	-	0.5 J (0.5)	6.3 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	2 (0.5)	1 (0.5)	0.7 J (0.5)	0.6 J (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	8 (0.5)	ND (1) (0.5)	ND (1) (0.5)	33 (3)	11 (0.5)
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.029) (0.0095)	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.028) (0.010)	0.020 J (0.0097)	ND (0.028) (0.010)	ND (0.029) (0.0095)	ND (0.028) (0.010)	ND (0.029) (0.0096)	ND (0.028) (0.010)
Semi-Volatile Organic Compounds																							
Anthracene	µg/L	66	0.503 (0.10)	-	0.52 (0.010)	0.377 (0.10)	-	0.217 (0.10)	-	0.084 (0.010)	ND (0.057) (0.010)	0.36 (0.010)	0.37 (0.010)	0.26 (0.010)	0.33 (0.010)	0.33 J (0.010)	0.10 J (0.010)	6.0 (0.10)	6.1 (0.010)	0.096 (0.010)	0.095 (0.010)	1.7 (0.010)	0.78 (0.010)
Benzo(a)Anthracene	µg/L	4.9	0.254 (0.10)	-	0.066 (0.010)	0.197 (0.10)	-	0.187 (0.10)	-	0.17 (0.010)	0.013 J (0.010)	0.10 (0.010)	0.10 (0.010)	0.065 (0.010)	0.49 (0.010)	0.27 J (0.010)	0.13 J (0.010)	2.1 (0.10)	1.2 (0.010)	0.048 J (0.010)	0.080 (0.010)	1.3 (0.010)	0.36 (0.010)
Benzo(a)Pyrene	µg/L	0.2	ND (0.10) (0.10)	-	0.037 J (0.010)	ND (0.10) (0.10)	-	**0.223 (0.10)**	-	0.17 (0.010)	0.015 J (0.010)	0.11 (0.010)	0.090 (0.010)	0.043 J (0.010)	**0.45 (0.010)**	0.18 J (0.010)	0.092 J (0.010)	**1.0 (0.10)**	**0.51 J (0.010)**	0.032 J (0.010)	0.060 J (0.010)	**0.89 (0.010)**	**0.22 J (0.010)**
Benzo(b)Fluoranthene	µg/L	1.2	ND (0.10) (0.10)	-	0.038 J (0.010)	ND (0.10) (0.10)	-	0.222 (0.10)	-	0.19 (0.010)	0.020 J (0.010)	0.12 (0.010)	0.088 (0.010)	0.044 J (0.010)	0.50 (0.010)	0.18 J (0.010)	0.094 J (0.010)	1.0 (0.10)	0.55 J (0.010)	0.038 J (0.010)	0.065 J (0.010)	1.1 (0.010)	0.27 J (0.010)
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.10)	-	0.016 J (0.010)	ND (0.10) (0.10)	-	0.173 (0.10)	-	0.12 (0.010)	0.016 J (0.010)	0.047 J (0.010)	0.043 J (0.010)	0.020 J (0.010)	0.19 (0.010)	0.085 J (0.010)	0.041 J (0.010)	0.25 J (0.10)	0.12 J (0.010)	0.015 J (0.010)	0.034 J (0.010)	**0.38 (0.010)**	0.096 J (0.010)
Chrysene	µg/L	1.9	0.190 (0.10)	-	0.063 (0.010)	0.131 (0.10)	-	0.268 (0.10)	-	0.17 (0.010)	0.017 J (0.010)	0.11 (0.010)	0.11 (0.010)	0.069 (0.010)	0.51 (0.010)	0.25 (0.010)	0.15 (0.010)	1.4 (0.10)	0.90 (0.010)	0.042 J (0.010)	0.081 (0.010)	1.2 (0.010)	0.33 (0.010)
Fluorene	µg/L	1900	3.09 (0.10)	-	2.1 (0.010)	1.98 (0.10)	-	0.527 (0.10)	-	0.043 J (0.010)	ND (0.057) (0.010)	2.5 (0.010)	2.3 (0.010)	0.61 (0.010)	0.42 (0.010)	0.56 J (0.010)	0.23 J (0.010)	16 (0.10)	18 (0.010)	0.25 (0.010)	0.27 (0.010)	5.9 (0.010)	3.2 (0.010)
Naphthalene	µg/L	100	1.38 (0.10)	-	ND (0.061) (0.030)	41.7 (0.10)	-	0.165 (0.10)	-	0.071 (0.030)	ND (0.069) (0.030)	2.3 (0.031)	4.8 (0.031)	ND (0.068) (0.030)	0.27 (0.031)	ND (0.061) (0.030)	ND (0.064) (0.030)	13 (0.31)	12 (0.030)	0.099 (0.030)	0.083 (0.030)	ND (0.061) (0.030)	ND (0.062) (0.030)
Phenanthrene	µg/L	1100	0.172 (0.10)	-	0.92 (0.030)	1.44 (0.10)	-	0.296 (0.10)	-	0.069 (0.030)	ND (0.069) (0.030)	1.3 (0.031)	1.8 (0.031)	0.99 (0.030)	0.38 (0.031)	0.26 J (0.030)	0.036 J (0.030)	23 (0.31)	22 (0.030)	0.43 (0.030)	0.48 (0.030)	8.7 (0.030)	3.5 (0.030)
Pyrene	µg/L	130	1.07 (0.10)	-	0.41 (0.010)	0.646 (0.10)	-	0.587 (0.10)	-	0.27 (0.010)	0.035 J (0.010)	0.35 (0.010)	0.34 (0.010)	0.31 (0.010)	1.4 (0.010)	1.0 (0.010)	0.86 (0.010)	6.4 (0.10)	4.8 (0.010)	0.19 (0.010)	0.33 (0.010)	2.3 (0.010)	0.93 (0.010)
Metals																							
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																							
Arsenic	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	-	ND (3.0) (3.0)	**33.8 (0.13)**	**6.5 (0.09)**	ND (1.0) (0.13)	ND (1.0) (0.13)	ND (1.0) (0.09)	0.18 J (0.13)	0.30 J (0.09)	0.25 J (0.09)	0.75 J (0.13)	1.4 (0.09)	ND (1.0) (0.13)	1.9 (0.09)	**6.9 (0.13)**	3.1 (0.09)
Manganese	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																							
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			C-134D				U-4				URS-1				URS-2		URS-3			URS-4			
Sample Date			1-Apr-13	1-Apr-13	20-Jul-16	19-Aug-16	9-Jan-13	9-Jan-13	5-May-16	22-Aug-16	9-Jan-13	9-Jan-13	9-May-16	23-Aug-16	9-Jan-13	9-Jan-13	9-May-16	24-Aug-16	24-Aug-16	9-Jan-13	9-Jan-13	9-May-16	24-Aug-16
Sample ID			C-134D_40113	C-134D_40113	GW-11109614-C-134D-072016-AC-002	GW-11109614-C134D-081916-AC-02	U4_010913	U4_010913	GW-11109613-U4-05-05-16-AC-022	GW-11109613-U-4-082216-AC-004	URS-1_010913	URS-1_010913	GW-11109613-URS1-05-09-16-MM-028	GW-11109613-URS-1-082316-AC-013	URS2_010913	URS2_010913	GW-11109613-URS3-05-09-16-MM-030	GW-11109613-URS-3-082416-KC-024	GW-11109613-URS-3-082416-KC-025	URS-4_010913	URS-4_010913	GW-11109613-URS4-05-09-16-MM-026	GW-11109613-URS-4-082416-AC-017
Sampling Company			LANGAN	LANGAN	GHD	GHD	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	GHD	GHD	GHD	UNKNOWN	UNKNOWN	GHD	GHD
Laboratory			ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	LL	LL	LL	ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order			JB32976	JB32976	1686199	1698036	JB26467	JB26467	1658374	1699628	JB26465	JB26465	1659064	1699628	JB26467	JB26467	1659064	1700681	1700681	JB26465	JB26465	1659064	1700681
Laboratory Sample ID	Units	MSC-PA	JB32976-6	JB32976-6F	8489350	8541532	JB26467-4	JB26467-4F	8370277	8548680	JB26465-1	JB26465-1F	8373133	8548690	JB26467-5	JB26467-5F	8373135	8553516	8553517	JB26465-2	JB26465-2F	8373131	8553509
Field Parameters																							
Conductivity	mS/cm	n/v	-	-	0.725	-	-	-	0.597	0.66	-	-	0.352	0.44	-	-	0.72	-	0.68	-	-	0.34	0.41
Dissolved Oxygen, Field Measured	mg/L	n/v	-	-	2.83	-	-	-	2.6	2.76	-	-	7.7	0.12	-	-	0.75	-	33.82	-	-	2.45	2.79
Oxidation Reduction Potential, Field Measured	mV	n/v	-	-	-48	-	-	-	-103	-153	-	-	-101	-135	-	-	-146	-	-154	-	-	-96	-142
pH, FIELD MEASURED	S.U.	n/v	-	-	6.58	-	-	-	7.59	7.56	-	-	6.89	7.17	-	-	6.46	-	6.79	-	-	6.64	6.99
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	-	-	22.45	-	-	-	13.7	28.07	-	-	13.9	21.9	-	-	14.5	-	22.6	-	-	18.98	24.11
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	n/v	-	-	76.4	-	-	-	3.7	0	-	-	0	0	-	-	3.3	-	67.4	-	-	760	264
Volatile Organic Compounds																							
Benzene	µg/L	5	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	1.4 (1.0)	-	2 (0.5)	ND (1) (0.5)	**13.0 (1.0)**	-	ND (1) (0.5)	ND (1) (0.5)	3.4 (1.0)	-	4 (0.5)	2 (0.5)	1 (0.5)	**46.8 (1.0)**	-	ND (1) (0.5)	ND (1) (0.5)
1,2-Dichloroethane (EDC)	µg/L	5	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
Ethylbenzene	µg/L	700	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	3.8 (1.0)	-	0.6 J (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
Isopropylbenzene (Cumene)	µg/L	3500	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	3.4 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	7.7 (2.0)	-	55 (0.5)	2 J (0.5)	17 (0.5)	2.8 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)
Methyl Tertiary Butyl Ether	µg/L	20	0.92 J (0.16)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	4.7 (1.0)	-	2 (0.5)	2 (0.5)
Toluene	µg/L	1000	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	0.9 J (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	2.3 (1.0)	-	2 (0.5)	0.9 J (0.5)	1 (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
Total BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	2.9 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	6.2 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	0.5 J (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)
1,3,5-Trimethylbenzene	µg/L	1200	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	2.2 (2.0)	-	0.8 J (0.5)	0.7 J (0.5)	0.8 J (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)
Xylenes, Total (Dimethylbenzene)	µg/L	10000	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	8.3 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	19.9 (1.0)	-	9 (0.5)	8 (0.5)	7 (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.011)	-	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.029) (0.0095)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.029) (0.0098)	ND (0.029) (0.010)	ND (0.020) (0.020)	-	0.011 J (0.0096)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.020) (0.020)	-	ND (0.029) (0.0098)	ND (0.028) (0.010)
Semi-Volatile Organic Compounds																							
Anthracene	µg/L	66	ND (0.10) (0.020)	-	0.011 J (0.010)	ND (0.050) (0.010)	1.18 (0.10)	-	0.058 (0.010)	0.32 J (0.010)	ND (0.10) (0.10)	-	0.33 (0.010)	0.62 (0.010)	1.23 (0.10)	-	21 (0.10)	0.17 (0.010)	9.6 (0.010)	ND (0.10) (0.10)	-	0.052 (0.010)	0.027 J (0.010)
Benzo(a)Anthracene	µg/L	4.9	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.997 (0.10)	-	0.42 (0.010)	0.99 (0.010)	ND (0.10) (0.10)	-	0.038 J (0.010)	0.017 J (0.010)	0.787 (0.10)	-	**66 (0.10)**	**5.3 (0.010)**	**17 (0.010)**	ND (0.10) (0.10)	-	0.012 J (0.010)	ND (0.050) (0.010)
Benzo(a)Pyrene	µg/L	0.2	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	**0.686 (0.10)**	-	**0.78 (0.010)**	**2.7 J (0.010)**	ND (0.10) (0.10)	-	0.028 J (0.010)	0.053 UJ (0.010)	**0.407 (0.10)**	-	**47 (0.10)**	**4.5 (0.010)**	**12 (0.010)**	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)
Benzo(b)Fluoranthene	µg/L	1.2	ND (0.10) (0.010)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.350 (0.10)	-	0.33 (0.010)	1.1 J (0.010)	ND (0.10) (0.10)	-	0.034 J (0.010)	0.053 UJ (0.010)	0.333 (0.10)	-	**56 (0.10)**	**5.4 (0.010)**	**14 (0.010)**	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.10) (0.016)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	**0.344 (0.10)**	-	**0.44 (0.010)**	**2.4 J (0.010)**	ND (0.10) (0.10)	-	0.012 J (0.010)	0.053 UJ (0.010)	**0.314 (0.10)**	-	**14 (0.10)**	**1.4 (0.010)**	**3.2 (0.010)**	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)
Chrysene	µg/L	1.9	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	1.59 (0.10)	-	1.1 (0.010)	**4.5 (0.010)**	ND (0.10) (0.10)	-	0.035 J (0.010)	0.012 J (0.010)	0.805 (0.10)	-	**46 (0.10)**	**3.9 (0.010)**	**12 (0.010)**	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)
Fluorene	µg/L	1900	ND (0.10) (0.017)	-	0.075 (0.010)	ND (0.050) (0.010)	1.91 (0.10)	-	0.085 (0.010)	0.22 J (0.010)	1.37 (0.10)	-	5.2 (0.010)	16 (0.010)	1.61 (0.10)	-	27 (0.10)	4.9 (0.010)	28 (0.010)	0.144 (0.10)	-	0.019 J (0.010)	0.022 J (0.010)
Naphthalene	µg/L	100	ND (0.10) (0.036)	-	ND (0.061) (0.030)	ND (0.060) (0.030)	0.692 (0.10)	-	ND (0.062) (0.031)	9.3 (0.030)	1.74 (0.10)	-	0.29 (0.030)	4.4 (0.030)	1.24 (0.10)	-	3.2 (0.31)	ND (0.065) (0.030)	ND (0.061) (0.030)	0.268 (0.10)	-	ND (0.060) (0.030)	ND (0.060) (0.030)
Phenanthrene	µg/L	1100	ND (0.10) (0.021)	-	ND (0.061) (0.030)	ND (0.060) (0.030)	3.29 (0.10)	-	ND (0.062) (0.031)	ND (0.60) (0.030)	0.127 (0.10)	-	0.73 (0.030)	0.98 (0.030)	1.99 (0.10)	-	55 (0.31)	2.5 (0.030)	40 (0.030)	0.113 (0.10)	-	0.055 J (0.030)	ND (0.060) (0.030)
Pyrene	µg/L	130	ND (0.10) (0.015)	-	0.033 J (0.010)	ND (0.050) (0.010)	2.59 (0.10)	-	1.1 (0.010)	2.9 (0.010)	0.218 (0.10)	-	0.18 (0.010)	0.32 (0.010)	2.09 (0.10)	-	130 (0.51)	8.4 (0.010)	31 (0.010)	0.443 (0.10)	-	0.074 (0.010)	0.067 (0.010)
Metals																							
Arsenic	µg/L	10	4.9 (0.97)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	ND (50) (0.59)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	17100 (24)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	**5.7 (1.7)**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	µg/L	300	**785 (0.40)**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	ND (0.20) (0.089)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																							
Arsenic	µg/L	10	-	2.1 J (0.97)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	µg/L	35	-	ND (50) (0.59)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	µg/L	n/v	-	1150 (24)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/L	5	-	**6.0 (1.7)**	ND (1.0) (0.090)	ND (1.0) (0.090)	-	ND (3.0) (3.0)	0.50 J (0.13)	0.78 J (0.09)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	0.22 J (0.09)	-	3.5 (3.0)	1.3 (0.13)	-	2.1 (0.090)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	ND (1.0) (0.090)
Manganese	µg/L	300	-	**711 (0.40)**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	µg/L	2	-	ND (0.20) (0.089)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																							
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	382000 (5000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	383000 (3500)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	136000 (48)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	µg/L	4000	740 (5.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	16200 (1200)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	30 B (5.6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	30 B (4.6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	ND (10) (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	11200 (380)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	µg/L	n/v	410 B (280)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Carbon	µg/L	n/v	2900 (240)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	544000 (1800)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			**URS-5**			**WPM-11**	
Sample Date			**10-May-16**	**24-Aug-16**	**24-Aug-16**	**9-Jan-13**	**9-Jan-13**
Sample ID			**GW-11109613-URS5-05-10-16-MM-040**	**GW-11109613-URS-5-082416-AC-020**	**GW-11109613-URS-5-082416-KC-021**	**WPM-11_010913**	**WPM-11_010913**
Sampling Company			**GHD**	**GHD**	**GHD**	**UNKNOWN**	**UNKNOWN**
Laboratory			**LL**	**LL**	**LL**	**ACCUTEST**	**ACCUTEST**
Laboratory Work Order			**1660120**	**1700681**	**1700681**	**JB26465**	**JB26465**
Laboratory Sample ID	**Units**	**MSC-PA**	**8378036**	**8553512**	**8553513**	**JB26465-3**	**JB26465-3F**
Field Parameters							
Conductivity	mS/cm	n/v	1.24	-	0.94	-	-
Dissolved Oxygen, Field Measured	mg/L	n/v	1.29	-	3.22	-	-
Oxidation Reduction Potential, Field Measured	mV	n/v	-319	-	-319	-	-
pH, FIELD MEASURED	S.U.	n/v	7.77	-	7.59	-	-
Specific Conductance Field	mS/cm	n/v	-	-	-	-	-
Temperature, Field Measured	deg c	n/v	14.23	-	22.44	-	-
Total Dissolved Solids, Field Measured	g/L	n/v	-	-	-	-	-
Turbidity	NTU	n/v	70	-	413	-	-
Volatile Organic Compounds							
Benzene	µg/L	5	**4000 (13)**	**2300 (0.5)**	**4900 (0.5)**	**20.5 (1.0)**	-
1,2-Dichloroethane (EDC)	µg/L	5	ND (25) (13)	ND (10) (0.5)	ND (20) (0.5)	ND (1.0) (1.0)	-
Ethylbenzene	µg/L	700	560 (13)	280 (0.5)	530 (0.5)	ND (1.0) (1.0)	-
Isopropylbenzene (Cumene)	µg/L	3500	22 J (13)	13 J (0.5)	31 J (0.5)	ND (2.0) (2.0)	-
Methyl Tertiary Butyl Ether	µg/L	20	ND (25) (13)	ND (10) (0.5)	ND (20) (0.5)	ND (1.0) (1.0)	-
Toluene	µg/L	1000	**8600 (130)**	**1500 (0.5)**	**6500 (0.5)**	ND (1.0) (1.0)	-
Total BTEX	µg/L	n/v	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L	62	**190 (13)**	**92 (0.5)**	**230 (0.5)**	ND (2.0) (2.0)	-
1,3,5-Trimethylbenzene	µg/L	1200	56 (13)	27 (0.5)	72 (0.5)	ND (2.0) (2.0)	-
Xylenes, Total (Dimethylbenzene)	µg/L	10000	3000 (13)	1500 (0.5)	2800 (0.5)	2.2 (1.0)	-
Volatile Organic Compounds (SW8011)							
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0097)	**0.089 (0.010)**	ND (0.040) (0.010)	ND (0.020) (0.020)	-
Semi-Volatile Organic Compounds							
Anthracene	µg/L	66	5.6 (0.10)	3.3 (0.010)	4.8 (0.010)	24.8 (0.50)	-
Benzo(a)Anthracene	µg/L	4.9	0.96 (0.10)	0.23 (0.010)	0.46 J (0.010)	**66.0 (5.0)**	-
Benzo(a)Pyrene	µg/L	0.2	**0.27 J (0.10)**	0.058 (0.010)	0.15 J (0.010)	**115 (5.0)**	-
Benzo(b)Fluoranthene	µg/L	1.2	0.24 J (0.10)	0.056 (0.010)	0.14 J (0.010)	**161 (5.0)**	-
Benzo(g,h,i)Perylene	µg/L	0.26	ND (0.51) (0.10)	0.017 J (0.010)	ND (0.51) (0.010)	**118 (5.0)**	-
Chrysene	µg/L	1.9	0.53 (0.10)	0.11 (0.010)	0.25 J (0.010)	**149 (5.0)**	-
Fluorene	µg/L	1900	14 (0.10)	1.5 (0.010)	14 (0.010)	18.0 (0.50)	-
Naphthalene	µg/L	100	**260 (3.0)**	**150 (0.030)**	**220 (0.030)**	1.86 (0.50)	-
Phenanthrene	µg/L	1100	20 (0.30)	12 (0.030)	21 (0.030)	96.5 (5.0)	-
Pyrene	µg/L	130	3.5 (0.10)	1.7 (0.010)	2.8 (0.010)	**265 (5.0)**	-
Metals							
Arsenic	µg/L	10	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-
Lead	µg/L	5	-	-	-	-	-
Manganese	µg/L	300	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-
Metals, Dissolved							
Arsenic	µg/L	10	-	-	-	-	-
Cobalt	µg/L	35	-	-	-	-	-
Iron	µg/L	n/v	-	-	-	-	-
Lead	µg/L	5	ND (1.0) (0.13)	ND (1.0) (0.090)	0.14 J (0.090)	-	ND (3.0) (3.0)
Manganese	µg/L	300	-	-	-	-	-
Mercury	µg/L	2	-	-	-	-	-
General Chemistry							
Alkalinity, Bicarbonate (As Caco3)	µg/L	n/v	-	-	-	-	-
Alkalinity, Total (As Caco3)	µg/L	n/v	-	-	-	-	-
Chloride (As Cl)	µg/L	n/v	-	-	-	-	-
Fluoride	µg/L	4000	-	-	-	-	-
Nitrogen, Ammonia (as n)	µg/L	30000	-	-	-	-	-
Nitrogen, Nitrate (as n)	µg/L	10000	-	-	-	-	-
Nitrogen, Nitrate-Nitrite	µg/L	n/v	-	-	-	-	-
Nitrogen, Nitrite	µg/L	1000	-	-	-	-	-
Sulfate (as SO4)	µg/L	n/v	-	-	-	-	-
Sulfide	µg/L	n/v	-	-	-	-	-
Total Carbon	µg/L	n/v	-	-	-	-	-
Total Dissolved Solids (Residue, Filterable)	µg/L	n/v	-	-	-	-	-

Historical Groundwater Analytical Results Summary - AOI 6 2013 to present
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Groundwater - Used Aquifer, Non Residential, TDS ≤ 2500
6.5	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
NM	Not measured.
B	Indicates the analyte is detected in the associated blank as well as in the sample.
J	Indicates an estimated value.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
µg/L	Micrograms per liter.
mg/L	Milligrams per liter.
mV	Millivolts.
S.U.	Standard Units.
mS/cm	Microsiemens per centimeter.
deg c	Degrees Celcius.
g/L	Grams per liter.
NTU	Nephelometric Turbidity Units.
LL	Eurofins Lancaster Laboratories Environmental
	Method detection limit is shown in second set of parentheses.

Table 9

2016 Gauging Data for AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Top Inner Casing Elevation (ft msl) (NAVD88)	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent NAPL Thickness (ft)	Corrected Groundwater Elevation (ft AMSL)	Assigned LNAPL Density	LNAPL Density Source Well	Comments
AOI 6	B-115	7.5	05/02/2016		2.49		5.01			
AOI 6	B-116	5.07	05/04/2016		5.38		-0.31	0.8654	B-129	
AOI 6	B-117	5.97	05/02/2016		8.15		-2.18			
AOI 6	B-125	8.51	05/02/2016		4.92		3.59			
AOI 6	B-126	8.51	05/02/2016		5.19		3.32			
AOI 6	B-131	8.72	05/02/2016		5.31		3.41			
AOI 6	B-132	6.87	05/02/2016	4.79	4.96	0.17	2.06	0.8654	B-129	LNAPL very viscous
AOI 6	B-133	7.33	05/02/2016		5.06		2.27			
AOI 6	B-134	6.52	05/02/2016	4.77	4.81	0.04	1.71			
AOI 6	B-144	9.02	05/02/2016	5.26	5.28	0.02	3.76	0.8654	B-144	LNAPL very viscous
AOI 6	B-145	9.81	05/02/2016		5.16		4.65			
AOI 6	B-150	7.8	05/02/2016	3.55	5.56	2.02	3.99	0.8668	B-150	
AOI 6	B-152	5.036	05/02/2016		1.09		3.95			
AOI 6	B-153	6.367	05/02/2016		2.77		3.60			
AOI 6	B-154	8.68	05/02/2016		3.92		4.76			
AOI 6	B-155	8.541	05/02/2016		5.37		3.17			
AOI 6	B-156	8.856	05/02/2016		5.91		2.95			
AOI 6	B-158	8.209	05/02/2016		3.71		4.50			
AOI 6	B-162	7.589	05/10/2016		2.25		5.34			
AOI 6	B-163	7.452	05/02/2016		1.62		5.83			
AOI 6	B-164	8.822	05/02/2016		5.28		3.54			
AOI 6	B-165	5.79	05/02/2016		3.07		2.72			
AOI 6	B-168	6.46	05/02/2016		2.96		3.50			
AOI 6	B-169	6.12	05/02/2016		2.31		3.81			
AOI 6	B-170	0.04	05/02/2016		2.37		-2.33			
AOI 6	B-39	5.48	05/02/2016	2.01	2.56	0.55	3.40	0.8734	B-39	LNAPL very viscous
AOI 6	B-43	7.21	05/11/2016		3.9		3.31			
AOI 6	B-45	5.099	05/02/2016		1.58		3.52			
AOI 6	U-4	9.22	05/02/2016		4.49		4.73			
AOI 6	URS-1	10.02	05/02/2016		6.63		3.39			
AOI 6	URS-3	7.6	05/02/2016		4.19		3.41			
AOI 6	URS-4	9.941	05/02/2016		6.87		3.07			
AOI 6	URS-5	7.94	05/02/2016		5.42		2.52	0.8734	B-39	
AOI 6	B-132D	10.31	05/02/2016		15.56		-5.25			
AOI 6	B-133D	8.6	05/02/2016		10.36		-1.76			
AOI 6	B-134D	8.12	05/02/2016		11.28		-3.16			
AOI 6	B-48D	9.42	05/02/2016		11.14		-1.72			

Table 10

Generalized Stratigraphic Section and Interpreted Hydrostratigraphic Units
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

<table>
<tr><th>System</th><th>Series</th><th colspan="2">Hydrogeologic Unit</th><th>Hydrostratigraphic Unit</th></tr>
<tr><td rowspan="2">Quaternary</td><td>Holocene</td><td colspan="2">Alluvium</td><td rowspan="3">Unconfined
(Water-Table) aquifer</td></tr>
<tr><td>Pleistocene</td><td colspan="2">Trenton "gravel"</td></tr>
<tr><td rowspan="8">Cretaceous</td><td rowspan="7">Upper
Cretaceous</td><td rowspan="8">Potomac-Raritan-Magothy aquifer system</td><td>Upper clay unit</td></tr>
<tr><td>Upper sand unit</td></tr>
<tr><td>Middle clay unit</td><td></td></tr>
<tr><td>Middle sand unit</td><td rowspan="5">Lower aquifer</td></tr>
<tr><td>Lower clay unit</td></tr>
<tr><td rowspan="2">Lower sand unit</td></tr>
<tr><td>Lower
Cretaceous</td></tr>
<tr><td>Pre-Cretaceous</td><td></td><td>Wissahickon Formation</td><td></td><td></td></tr>
</table>

Notes:

1. Adopted from Figure 2 of Schreffler, 2001.
2. Hydrostratigraphic units interpreted by Stantec based on observed AOI 1 subsurface conditions.

Table 11

Summary of LNAPL Characterization Results
(Generalized LNAPL Types)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Generalized LNAPL Type	Well ID	Sample Date	LNAPL Sub Types		Weathering	LNAPL Type Interpretation By
				Proportions %		
Middle Distillate	B-129	02/27/2004	Light Distillate	5	Severe	TGI
			Heavier Material	20	Extreme	TGI
			Middle Distillate	75	Extreme	TGI
Middle Distillate	B-130	02/27/2004	Middle Distillate	20	Severe	TGI
			Residual Oil	80	Extreme	TGI
Light Distillate	B-144	02/27/2004	Light Distillate	90	Severe	TGI
			Residual Oil	10	Severe	TGI
Middle Distillate	B-39	02/27/2004	Light Distillate	2	Severe	TGI
			Middle Distillate	98	Severe	TGI
Middle Distillate	B-43	02/27/2004	Middle Distillate	100	Extreme	TGI
Light Distillate	WP 9-2	03/01/2004	Aviation Gasoline	80	Severe	TGI
			Middle Distillate	20	Severe	TGI
Residual Oil	B-47	04/12/2006	Residual Oil	100	Extreme	TGI
			Unknown Aromatics	Trace	Extreme	TGI
Light Distillate	B-150	04/12/2006	Unknown Aromatics	100	Unknown	TGI

Table 12

Vapor Intrusion Screening Building Information
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

AOI	Building Number	Building Name	Approximate Footprint (square feet)	Height of Building	Basement	Description of Use	# Indoor Air Samples Collected
6	651	GP Training Bldg	13420	4	Yes	Fitness Center-3rd Floor	1
6						Offices - 1st Floor East	1
6						Offices - 1st Floor West	1
6						Offices - Basement	1
6	178	Trade Shops	5750	1	No	Lockers, Plumbers/Carpenter Shops	2
6	295	24 Gate Building	2501	2	No	2 floors offices	5
6	475	North Tank Field	1156	1	No	Control Room Office	2
6	650	GP - MOB	21558	4	Yes	Basement Center	1
6						Basement East	1
6						Basement West	1
6						1st Floor Entrance	1
6						1st Floor West	1
6						2nd Floor East	1
6						2nd Floor West	1
6	726	Carpenter Shop	1280	1	No	Carpenter Shop	2
6	739	Control Room	3150	1	No	Control Room	2
6	745	WTP	5700	1	No	Prefab, 5' by 10'	2
6	6627	Control Room	546	1	No	Control Room	2
6	6636	New Scale House	540	1	No	Trailer	2

Table 13

Summary of Indoor and Outdoor Air from the Vapor Intrusion Sampling
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location												AOI6-AA-16-001	AOI6-AA-16-002	AOI6-AI-16-001	AOI6-AI-16-002	AOI6-AI-16-003
Sample Date												Outdoor 28-Mar-16	Ambient Outdoor Near Carpenter Shop Open Area 29-Mar-16	475 Building 28-Mar-16	745 Building 28-Mar-16	Control Room, 6627 Building 28-Mar-16
Sample ID												IA-AOI6-OUTDOOR 739	IA-AOI6-OUTDOOR-032916	IA-AOI6-475	IA-AOI6-745	IA-AOI6-6627
Sampling Company												GHD	GHD	GHD	GHD	GHD
Laboratory												LL	ESC	LL	LL	LL
Laboratory Work Order												MHF24	L827327	MHF24	MHF24	MHF24
Laboratory Sample ID												8316897	L827327-04	8316892	8316893	8316894
Sample Type	Units	PADEP SHS VI Screening Value a	1/10th PADEP SHS VI Screening Value b	OSHA PEL c	USEPA RSL d	USEPA RSL e	ACGIH TLV f	NIOSH REL g	Cal/ OSHA PEL h	MH Air Tox i	EPA Res IA j					
Volatile Organic Compounds																
Benzene	µg/m^3	16	1.6	3190	1.6	1.6	1600	319.47	319.47	2.59	29	**1.8 J[bde]**	**3.95[bdei]**	**5.5[bdei]**	1.3 J	**36[abdeij]**
1,2-Dibromoethane (EDB)	µg/m^3	0.2	0.02	153700	0.02	0.02	-	345.79	-	n/v	n/v	ND (11)	ND (1.54)	ND (7.7)	ND (7.7)	ND (7.7)
1,2-Dichloroethane (EDC)	µg/m^3	4.7	0.47	202400	0.47	0.47	40500	4000	4000	0.16	0.2	ND (5.6)	ND (0.810)	ND (4.0)	ND (4.0)	ND (4.0)
Ethylbenzene	µg/m^3	49	4.9	435000	4.9	4.9	86800	435000	435000	0.68	17	ND (6.0)	ND (0.867)	**1.1 J[i]**	ND (4.3)	**2.0 J[i]**
Isopropylbenzene (Cumene)	µg/m^3	1800	180	245000	1800	180	246000	245000	245000	11.2	n/v	1.5 J	1.72	9.1	ND (4.9)	7.8
Methyl Tert-Butyl Ether	µg/m^3	470	47	-	47	47	180000	-	144000	n/v	72	ND (5.0)	ND (0.721)	ND (3.6)	ND (3.6)	ND (3.6)
Naphthalene	µg/m^3	3.6	0.36	50000	0.36	0.36	52000	50000	50000	n/v	4.8*	**4.1 J[abde]**	ND (3.30)	ND (5.2)	ND (5.2)	ND (5.2)
Toluene	µg/m^3	22000	2200	754000	22000	2200	75400	375000	37500	4.52	144	2.1 J	2.85	3.9	2.2 J	**13[i]**
1,2,4-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	0.38	6.5	ND (6.8)	ND (0.982)	**1.4 J[i]**	ND (4.9)	**3.6 J[bi]**
1,3,5-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	1.12	19	ND (6.8)	ND (0.982)	ND (4.9)	ND (4.9)	**1.3 J[i]**
Total Xylene	µg/m^3	440	44	435000	440	44	434000	435000	435000	3.14	63.5	**3.7 J[i]**	ND (1.73)	**4.7 J[i]**	**3.3 J[i]**	**11.9[i]**

Notes:

VI-PA[A]	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017).
[A]	Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
[B]	One-tenth of PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
OSHA[C]	Occupational Safety and Health Administration - Permissible Exposure Limits.
[C]	Permissible Exposure Limits.
USEPA RSL	United States Environmental Protection Agency (June 2017).
[D]	Regional Screening Level for Non-residential indoor air Hazard Index of 1.
[E]	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
ACGIH TLV	American Conference of Governmental Industrial Hygienists.
[F]	Threshold Limit Value.
NIOSH	National Institute for Occupational Safety and Health.
[G]	Recommended Exposure Limits.
Cal / OSHA [H]	California Division of Occupational Safety and Health - Permissible Exposure Limits for chemical contaminants.
MH Air Tox [I]	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA [J]	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
4.63[B]	Concentration exceeds the indicated standard.
1.32	Measured concentration did not exceed the indicated standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value.
J	Indicates an estimated value.

Table 13

Summary of Indoor and Outdoor Air from the Vapor Intrusion Sampling
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location												AOI6-AI-16-004	AOI6-AI-16-005	AOI6-AI-16-006	AOI6-AI-16-007	AOI6-AI-16-008
Sample Date												Truck Scale House, 6636 Building 28-Mar-16	Control Room, 739 Building 28-Mar-16	726 Building, Carpenter Shop 29-Mar-16	178 Building, Carpenter Trade Shop 29-Mar-16	295 Gate Building 1st Floor 29-Mar-16
Sample ID												IA-AOI6-6636	IA-AOI6-739	IA-AOI6-726	IA-AOI6-178	IA-AOI6-295-1
Sampling Company												GHD	GHD	GHD	GHD	GHD
Laboratory												LL	LL	ESC	ESC	ESC
Laboratory Work Order												MHF24	MHF24	L827327	L827327	L827327
Laboratory Sample ID												8316895	8316896	L827327-02	L827327-03	L827327-05
Sample Type	Units	PADEP SHS VI Screening Value a	1/10th PADEP SHS VI Screening Value b	OSHA PEL c	USEPA RSL d	USEPA RSL e	ACGIH TLV f	NIOSH REL g	Cal/ OSHA PEL h	MH Air Tox i	EPA Res IA j					
Volatile Organic Compounds																
Benzene	µg/m^3	16	1.6	3190	1.6	1.6	1600	319.47	319.47	2.59	29	**2.1 J[bde]**	**4.5[bdei]**	**3.46[bdei]**	**5.05[bdei]**	**3.97[bdei]**
1,2-Dibromoethane (EDB)	µg/m^3	0.2	0.02	153700	0.02	0.02	-	345.79	-	n/v	n/v	ND (7.7)	ND (7.7)	ND (1.54)	ND (1.54)	ND (1.54)
1,2-Dichloroethane (EDC)	µg/m^3	4.7	0.47	202400	0.47	0.47	40500	4000	4000	0.16	0.2	ND (4.0)	ND (4.0)	ND (0.810)	ND (0.810)	ND (0.810)
Ethylbenzene	µg/m^3	49	4.9	435000	4.9	4.9	86800	435000	435000	0.68	17	**2.1 J[i]**	**3.2 J[i]**	ND (0.867)	ND (0.867)	ND (0.867)
Isopropylbenzene (Cumene)	µg/m^3	1800	180	245000	1800	180	246000	245000	245000	11.2	n/v	ND (4.9)	2.8 J	1.45	1.60	ND (0.983)
Methyl Tert-Butyl Ether	µg/m^3	470	47	-	47	47	180000	-	144000	n/v	72	ND (3.6)	ND (3.6)	ND (0.721)	ND (0.721)	ND (0.721)
Naphthalene	µg/m^3	3.6	0.36	50000	0.36	0.36	52000	50000	50000	n/v	4.8*	ND (5.2)	ND (5.2)	ND (3.30)	ND (3.30)	ND (3.30)
Toluene	µg/m^3	22000	2200	754000	22000	2200	75400	375000	37500	4.52	144	2.6 J	3.9	2.06	2.57	3.12
1,2,4-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	0.38	6.5	**1.1 J[i]**	ND (4.9)	ND (0.982)	ND (0.982)	**2.18[i]**
1,3,5-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	1.12	19	ND (4.9)	ND (4.9)	ND (0.982)	ND (0.982)	ND (0.982)
Total Xylene	µg/m^3	440	44	435000	440	44	434000	435000	435000	3.14	63.5	**9.8[i]**	**14.1[i]**	ND (1.73)	1.76	2.2

Notes:

VI-PA[A]	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017).
[A]	Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
[B]	One-tenth of PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
OSHA[C]	Occupational Safety and Health Administration - Permissible Exposure Limits.
[C]	Permissible Exposure Limits.
USEPA RSL	United States Environmental Protection Agency (June 2017).
[D]	Regional Screening Level for Non-residential indoor air Hazard Index of 1.
[E]	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
ACGIH TLV	American Conference of Governmental Industrial Hygienists.
[F]	Threshold Limit Value.
NIOSH	National Institute for Occupational Safety and Health.
[G]	Recommended Exposure Limits.
Cal / OSHA [H]	California Division of Occupational Safety and Health - Permissible Exposure Limits for chemical contaminants.
MH Air Tox [I]	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA [J]	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
4.63[B]	Concentration exceeds the indicated standard.
1.32	Measured concentration did not exceed the indicated standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value.
J	Indicates an estimated value.

Table 13

Summary of Indoor and Outdoor Air from the Vapor Intrusion Sampling
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location												AOI6-AI-16-009	AOI6-AI-17-01	AOI6-AI-17-02	AOI6-AI-17-03	AOI6-AI-17-04	AOI6-AI-17-05
												295 Gate Building 2nd Floor	651 GP Training Building 3rd Floor, Fitness Center	651 GP Training Building 1st Floor, East	651 GP Training Building 1st Floor, West	651 GP Training Building Basement, Lunch Area	178 Building, Carpenter Trade Shop
Sample Date												29-Mar-16	8-Mar-17	8-Mar-17	8-Mar-17	8-Mar-17	9-Mar-17
Sample ID												IA-AOI6-295-2	AOI6-AI-17-01	AOI6-AI-17-02	AOI6-AI-17-03	AOI6-AI-17-04	AOI6-AI-17-05
Sampling Company												GHD	GHD	GHD	GHD	GHD	GHD
Laboratory												ESC	LL	LL	LL	LL	PACE
Laboratory Work Order												L827327	1775150	1775150	1775150	1775150	10381753
Laboratory Sample ID												L827327-06	8876948	8876950	8876949	8876953	10381753003
Sample Type	Units	PADEP SHS VI Screening Value a	1/10th PADEP SHS VI Screening Value b	OSHA PEL c	USEPA RSL d	USEPA RSL e	ACGIH TLV f	NIOSH REL g	Cal/ OSHA PEL h	MH Air Tox i	EPA Res IA j						
Volatile Organic Compounds																	
Benzene	µg/m^3	16	1.6	3190	1.6	1.6	1600	319.47	319.47	2.59	29	**3.94**[bdei]	**6.9 (0.64)**[bdei]	**6.8 (0.64)**[bdei]	**7.1 (0.64)**[bdei]	**6.4 (0.64)**[bdei]	0.76 J (0.16)
1,2-Dibromoethane (EDB)	µg/m^3	0.2	0.02	153700	0.02	0.02	-	345.79	-	n/v	n/v	ND (1.54)	ND (7.7) (1.5)	ND (7.7) (1.5)	ND (7.7) (1.5)	ND (7.7) (1.5)	ND (2.1) (1.0)
1,2-Dichloroethane (EDC)	µg/m^3	4.7	0.47	202400	0.47	0.47	40500	4000	4000	0.16	0.2	ND (0.810)	ND (4.0) (0.81)	ND (4.0) (0.81)	ND (4.0) (0.81)	ND (4.0) (0.81)	ND (1.1) (0.27)
Ethylbenzene	µg/m^3	49	4.9	435000	4.9	4.9	86800	435000	435000	0.68	17	**0.960**[i]	ND (4.3) (0.87)	**0.93 J (0.87)**[i]	**1.0 J (0.87)**[i]	ND (4.3) (0.87)	**1.5 J (0.57)**[i]
Isopropylbenzene (Cumene)	µg/m^3	1800	180	245000	1800	180	246000	245000	245000	11.2	n/v	ND (0.983)	3.3 J (0.98)	2.1 J (0.98)	2.3 J (0.98)	1.5 J (0.98)	ND (3.4) (0.18)
Methyl Tert-Butyl Ether	µg/m^3	470	47	-	47	47	180000	-	144000	n/v	72	ND (0.721)	ND (3.6) (0.72)	ND (3.6) (0.72)	ND (3.6) (0.72)	ND (3.6) (0.72)	ND (4.9) (0.41)
Naphthalene	µg/m^3	3.6	0.36	50000	0.36	0.36	52000	50000	50000	n/v	4.8*	ND (3.30)	**9.6 (2.6)**[abdej]	ND (5.2) (2.6)	ND (5.2) (2.6)	ND (5.2) (2.6)	**3.3 J (0.41)**[bde]
Toluene	µg/m^3	22000	2200	754000	22000	2200	75400	375000	37500	4.52	144	3.11	3.7 J (0.75)	**5.2 (0.75)**[i]	3.9 (0.75)	3.0 J (0.75)	1.7 (0.21)
1,2,4-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	0.38	6.5	**2.04**[i]	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (4.9) (0.98)	**2.0 J (0.17)**[i]
1,3,5-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	1.12	19	ND (0.982)	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (3.3) (0.25)
Total Xylene	µg/m^3	440	44	435000	440	44	434000	435000	435000	3.14	63.5	2.29	-	-	-	-	**4.5 (1.5)**[i]

Notes:

VI-PA[A]	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017).
A	Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
B	One-tenth of PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
OSHA[C]	Occupational Safety and Health Administration - Permissible Exposure Limits.
C	Permissible Exposure Limits.
USEPA RSL	United States Environmental Protection Agency (June 2017).
D	Regional Screening Level for Non-residential indoor air Hazard Index of 1.
E	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
ACGIH TLV	American Conference of Governmental Industrial Hygienists.
F	Threshold Limit Value.
NIOSH	National Institute for Occupational Safety and Health.
G	Recommended Exposure Limits.
Cal / OSHA [H]	California Division of Occupational Safety and Health - Permissible Exposure Limits for chemical contaminants.
MH Air Tox [I]	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA [J]	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
4.63[B]	Concentration exceeds the indicated standard.
1.32	Measured concentration did not exceed the indicated standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value.
J	Indicates an estimated value.

Table 13

Summary of Indoor and Outdoor Air from the Vapor Intrusion Sampling
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location												AOI6-AI-17-06	AOI6-AI-17-07		AOI6-AI-17-08	AOI6-AI-17-09	AOI6-AI-17-10
Sample Date												295 Gate Building 2nd Floor 8-Mar-17	295 Gate Building 1st Floor 8-Mar-17	295 Gate Building 1st Floor 9-Mar-17	475 Building 8-Mar-17	650 GP Office Building Basement, Center 8-Mar-17	650 GP Office Building Basement, East 8-Mar-17
Sample ID												AOI6-AI-17-06	AOI6-AI-17-07	AOI6-AI-17-07R	AOI6-AI-17-08	AOI6-AI-17-09	AOI6-AI-17-22
Sampling Company												GHD	GHD	GHD	GHD	GHD	GHD
Laboratory												PACE	LL	PACE	LL	PACE	PACE
Laboratory Work Order												10381907	1775150	10381907	1775150	10381907	10382287
Laboratory Sample ID												10381907007	8876951	10381907008	8876947	10381907001	10382287008
Sample Type	Units	PADEP SHS VI Screening Value a	1/10th PADEP SHS VI Screening Value b	OSHA PEL c	USEPA RSL d	USEPA RSL e	ACGIH TLV f	NIOSH REL g	Cal/ OSHA PEL h	MH Air Tox i	EPA Res IA j						FIELD DUPLICATE SAMPLE
Volatile Organic Compounds																	
Benzene	µg/m^3	16	1.6	3190	1.6	1.6	1600	319.47	319.47	2.59	29	**2.2 (0.16)[bde]**	**6.2 (0.64)[bdei]**	**8.2 (0.19)[bdei]**	**4.3 (0.64)[bdei]**	**6.4 (0.16)[bdei]**	**10.3 (0.16)[bdei]**
1,2-Dibromoethane (EDB)	µg/m^3	0.2	0.02	153700	0.02	0.02	-	345.79	-	n/v	n/v	ND (5.2) (1.0)	ND (7.7) (1.5)	ND (2.4) (1.2)	ND (7.7) (1.5)	ND (2.1) (1.0)	ND (2.1) (1.0)
1,2-Dichloroethane (EDC)	µg/m^3	4.7	0.47	202400	0.47	0.47	40500	4000	4000	0.16	0.2	ND (0.55) (0.27)	ND (4.0) (0.81)	ND (0.64) (0.32)	ND (4.0) (0.81)	ND (1.1) (0.27)	ND (0.55) (0.27)
Ethylbenzene	µg/m^3	49	4.9	435000	4.9	4.9	86800	435000	435000	0.68	17	**2.2 J (0.57)[i]**	ND (4.3) (0.87)	**1.7 (0.66)[i]**	ND (4.3) (0.87)	**1.5 J (0.57)[i]**	ND (1.2) (0.57)
Isopropylbenzene (Cumene)	µg/m^3	1800	180	245000	1800	180	246000	245000	245000	11.2	n/v	ND (3.4) (0.18)	2.6 J (0.98)	ND (3.9) (0.21)	**310 (0.98)[bei]**	ND (3.4) (0.18)	ND (3.4) (0.18)
Methyl Tert-Butyl Ether	µg/m^3	470	47	-	47	47	180000	-	144000	n/v	72	ND (4.9) (0.41)	ND (3.6) (0.72)	ND (5.7) (0.47)	ND (3.6) (0.72)	ND (4.9) (0.41)	0.47 J (0.41)
Naphthalene	µg/m^3	3.6	0.36	50000	0.36	0.36	52000	50000	50000	n/v	4.8*	**0.52 J (0.41)[bde]**	ND (5.2) (2.6)	ND (4.1) (0.47)	ND (5.2) (2.6)	**3.5 J (0.41)[bde]**	**1.6 J (0.41)[bde]**
Toluene	µg/m^3	22000	2200	754000	22000	2200	75400	375000	37500	4.52	144	**10.4 (0.21)[i]**	3.6 J (0.75)	**7.3 (0.24)[i]**	2.4 J (0.75)	2.1 (0.21)	2.8 (0.21)
1,2,4-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	0.38	6.5	**2.8 J (0.17)[i]**	ND (4.9) (0.98)	**4.4 (0.19)[bi]**	**1.2 J (0.98)[i]**	**2.1 J (0.17)[i]**	**0.58 J (0.17)[i]**
1,3,5-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	1.12	19	ND (3.3) (0.25)	ND (4.9) (0.98)	ND (1.5) (0.28)	ND (4.9) (0.98)	ND (3.3) (0.25)	ND (1.3) (0.25)
Total Xylene	µg/m^3	440	44	435000	440	44	434000	435000	435000	3.14	63.5	**8.4 (1.5)[i]**	-	**8.8 (1.8)[i]**	-	**4.8 (1.5)[i]**	ND (3.6) (1.5)

Notes:

VI-PA[A]	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017).
[A]	Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
[B]	One-tenth of PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
OSHA[C]	Occupational Safety and Health Administration - Permissible Exposure Limits.
[C]	Permissible Exposure Limits.
USEPA RSL	United States Environmental Protection Agency (June 2017).
[D]	Regional Screening Level for Non-residential indoor air Hazard Index of 1.
[E]	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
ACGIH TLV	American Conference of Governmental Industrial Hygienists.
[F]	Threshold Limit Value.
NIOSH	National Institute for Occupational Safety and Health.
[G]	Recommended Exposure Limits.
Cal / OSHA [H]	California Division of Occupational Safety and Health - Permissible Exposure Limits for chemical contaminants.
MH Air Tox [I]	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA [J]	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
4.63 [B]	Concentration exceeds the indicated standard.
1.32	Measured concentration did not exceed the indicated standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value.
J	Indicates an estimated value.

Table 13

Summary of Indoor and Outdoor Air from the Vapor Intrusion Sampling
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location												AOI6-AI-17-11	AOI6-AI-17-12	AOI6-AI-17-13	AOI6-AI-17-14	AOI6-AI-17-15	AOI6-AI-17-17
												650 GP Office Building Basement, West	650 GP Office Building 1st Floor, Entrance	650 GP Office Building 1st Floor, West	650 GP Office Building 2nd Floor, East	650 GP Office Building 2nd Floor, West	726 Building, Carpenter Shop
Sample Date												8-Mar-17	8-Mar-17	8-Mar-17	8-Mar-17	9-Mar-17	8-Mar-17
Sample ID												AOI6-AI-17-11	AOI6-AI-17-12	AOI6-AI-17-13	AOI6-AI-17-14	AOI6-AI-17-15	AOI6-AI-17-17
Sampling Company												GHD	GHD	GHD	GHD	GHD	GHD
Laboratory												PACE	PACE	PACE	PACE	LL	LL
Laboratory Work Order												10381907	10381907	10381907	10381907	1777963	1775150
Laboratory Sample ID												10381907003	10381907004	10381907005	10381907006	8889684	8876957
Sample Type	Units	PADEP SHS VI Screening Value a	1/10th PADEP SHS VI Screening Value b	OSHA PEL c	USEPA RSL d	USEPA RSL e	ACGIH TLV f	NIOSH REL g	Cal/ OSHA PEL h	MH Air Tox i	EPA Res IA j						
Volatile Organic Compounds																	
Benzene	µg/m^3	16	1.6	3190	1.6	1.6	1600	319.47	319.47	2.59	29	**8.6 (0.18)[bdei]**	**14.1 (0.22)[bdei]**	**15.8 (0.16)[bdei]**	**5.9 (0.16)[bdei]**	**3.6 (0.64)[bdei]**	1.2 J (0.64)
1,2-Dibromoethane (EDB)	µg/m^3	0.2	0.02	153700	0.02	0.02	-	345.79	-	n/v	n/v	ND (5.6) (1.1)	ND (7.0) (1.4)	ND (5.2) (1.0)	ND (5.2) (1.0)	ND (7.7) (1.5)	ND (7.7) (1.5)
1,2-Dichloroethane (EDC)	µg/m^3	4.7	0.47	202400	0.47	0.47	40500	4000	4000	0.16	0.2	ND (0.59) (0.30)	ND (0.74) (0.37)	ND (0.55) (0.27)	ND (0.55) (0.27)	ND (4.0) (0.81)	ND (4.0) (0.81)
Ethylbenzene	µg/m^3	49	4.9	435000	4.9	4.9	86800	435000	435000	0.68	17	ND (3.2) (0.61)	ND (4.0) (0.76)	ND (3.0) (0.57)	ND (3.0) (0.57)	ND (4.3) (0.87)	ND (4.3) (0.87)
Isopropylbenzene (Cumene)	µg/m^3	1800	180	245000	1800	180	246000	245000	245000	11.2	n/v	ND (3.6) (0.20)	ND (4.5) (0.25)	ND (3.4) (0.18)	ND (3.4) (0.18)	ND (4.9) (0.98)	ND (4.9) (0.98)
Methyl Tert-Butyl Ether	µg/m^3	470	47	-	47	47	180000	-	144000	n/v	72	ND (5.3) (0.44)	ND (6.6) (0.55)	ND (4.9) (0.41)	ND (4.9) (0.41)	ND (3.6) (0.72)	ND (3.6) (0.72)
Naphthalene	µg/m^3	3.6	0.36	50000	0.36	0.36	52000	50000	50000	n/v	4.8*	**1.9 J (0.44)[bde]**	**1.0 J (0.55)[bde]**	**5.9 (0.41)[abdej]**	**0.74 J (0.41)[bde]**	ND (5.2) (2.6)	ND (5.2) (2.6)
Toluene	µg/m^3	22000	2200	754000	22000	2200	75400	375000	37500	4.52	144	3.5 (0.22)	4.1 (0.28)	**5.3 (0.21)[i]**	3.6 (0.21)	2.0 J (0.75)	1.4 J (0.75)
1,2,4-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	0.38	6.5	**2.5 J (0.18)[i]**	**3.0 J (0.22)[i]**	**2.4 J (0.17)[i]**	**2.6 J (0.17)[i]**	ND (4.9) (0.98)	ND (4.9) (0.98)
1,3,5-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	1.12	19	ND (3.6) (0.26)	ND (4.5) (0.33)	ND (3.3) (0.25)	ND (3.3) (0.25)	ND (4.9) (0.98)	ND (4.9) (0.98)
Total Xylene	µg/m^3	440	44	435000	440	44	434000	435000	435000	3.14	63.5	**7.7 (1.6)[i]**	**6.3 (2.0)[i]**	**7.9 (1.5)[i]**	**7.8 (1.5)[i]**	-	-

Notes:

VI-PA[A]	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017).
[A]	Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
[B]	One-tenth of PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
OSHA[C]	Occupational Safety and Health Administration - Permissible Exposure Limits.
[C]	Permissible Exposure Limits.
USEPA RSL	United States Environmental Protection Agency (June 2017).
[D]	Regional Screening Level for Non-residential indoor air Hazard Index of 1.
[E]	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
ACGIH TLV	American Conference of Governmental Industrial Hygienists.
[F]	Threshold Limit Value.
NIOSH	National Institute for Occupational Safety and Health.
[G]	Recommended Exposure Limits.
Cal / OSHA [H]	California Division of Occupational Safety and Health - Permissible Exposure Limits for chemical contaminants.
MH Air Tox [I]	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA [J]	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
4.63 [B]	Concentration exceeds the indicated standard.
1.32	Measured concentration did not exceed the indicated standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value.
J	Indicates an estimated value.

Table 13

Summary of Indoor and Outdoor Air from the Vapor Intrusion Sampling
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location												AOI6-AI-17-18	AOI6-AI-17-19	AOI6-AI-17-20	AOI6-AI-17-21
Sample Date												Control Room, 739 Building 8-Mar-17	745 Building 8-Mar-17	Control Room, 6627 Building 8-Mar-17	Truck Scale House, 6636 Building 8-Mar-17
Sample ID												AOI6-AI-17-18	AOI6-AI-17-19	AOI6-AI-17-20	AOI6-AI-17-21
Sampling Company												GHD	GHD	GHD	GHD
Laboratory												LL	LL	LL	LL
Laboratory Work Order												1775150	1775150	1775150	1775150
Laboratory Sample ID												8876952	8876958	8876946	8876956
Sample Type	Units	PADEP SHS VI Screening Value a	1/10th PADEP SHS VI Screening Value b	OSHA PEL c	USEPA RSL d	USEPA RSL e	ACGIH TLV f	NIOSH REL g	Cal/ OSHA PEL h	MH Air Tox i	EPA Res IA j				
Volatile Organic Compounds															
Benzene	µg/m^3	16	1.6	3190	1.6	1.6	1600	319.47	319.47	2.59	29	**10 (0.64)[bdei]**	0.86 J (0.64)	**21 (0.64)[abdei]**	**5.0 (0.64)[bdei]**
1,2-Dibromoethane (EDB)	µg/m^3	0.2	0.02	153700	0.02	0.02	-	345.79	-	n/v	n/v	ND (7.7) (1.5)	ND (7.7) (1.5)	ND (7.7) (1.5)	ND (7.7) (1.5)
1,2-Dichloroethane (EDC)	µg/m^3	4.7	0.47	202400	0.47	0.47	40500	4000	4000	0.16	0.2	ND (4.0) (0.81)	ND (4.0) (0.81)	ND (4.0) (0.81)	ND (4.0) (0.81)
Ethylbenzene	µg/m^3	49	4.9	435000	4.9	4.9	86800	435000	435000	0.68	17	ND (4.3) (0.87)	ND (4.3) (0.87)	**1.1 J (0.87)[i]**	ND (4.3) (0.87)
Isopropylbenzene (Cumene)	µg/m^3	1800	180	245000	1800	180	246000	245000	245000	11.2	n/v	**15 (0.98)[i]**	ND (4.9) (0.98)	**34 (0.98)[i]**	2.4 J (0.98)
Methyl Tert-Butyl Ether	µg/m^3	470	47	-	47	47	180000	-	144000	n/v	72	ND (3.6) (0.72)	ND (3.6) (0.72)	ND (3.6) (0.72)	ND (3.6) (0.72)
Naphthalene	µg/m^3	3.6	0.36	50000	0.36	0.36	52000	50000	50000	n/v	4.8*	ND (5.2) (2.6)	ND (5.2) (2.6)	ND (5.2) (2.6)	ND (5.2) (2.6)
Toluene	µg/m^3	22000	2200	754000	22000	2200	75400	375000	37500	4.52	144	2.5 J (0.75)	1.1 J (0.75)	2.7 J (0.75)	2.7 J (0.75)
1,2,4-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	0.38	6.5	ND (4.9) (0.98)	ND (4.9) (0.98)	**1.9 J (0.98)[i]**	ND (4.9) (0.98)
1,3,5-Trimethylbenzene**	µg/m^3	31	3.1	-	260	26	123000	125000	125000	1.12	19	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (4.9) (0.98)	ND (4.9) (0.98)
Total Xylene	µg/m^3	440	44	435000	440	44	434000	435000	435000	3.14	63.5	-	-	-	-

Notes:

VI-PA[A]	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017).
[A]	Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
[B]	One-tenth of PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential.
OSHA[C]	Occupational Safety and Health Administration - Permissible Exposure Limits.
[C]	Permissible Exposure Limits.
USEPA RSL	United States Environmental Protection Agency (June 2017).
[D]	Regional Screening Level for Non-residential indoor air Hazard Index of 1.
[E]	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
ACGIH TLV	American Conference of Governmental Industrial Hygienists.
[F]	Threshold Limit Value.
NIOSH	National Institute for Occupational Safety and Health.
[G]	Recommended Exposure Limits.
Cal / OSHA [H]	California Division of Occupational Safety and Health - Permissible Exposure Limits for chemical contaminants.
MH Air Tox [I]	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA [J]	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
4.63 [B]	Concentration exceeds the indicated standard.
1.32	Measured concentration did not exceed the indicated standard.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value.
J	Indicates an estimated value.

Table 14

Summary of Outdoor Air Sampling Over NAPL
AOI 6 Remedial Investigation Report
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				**AOI6-AA-16-001**	**AOI6-AA-16-002**	**AOI6-AA-16-003**
Sample ID:				**AOI6-AA16-001**	**AOI6-AA16-002**	**AOI6-AA16-003**
Sample Date:				**08/25/2016**	**08/25/2016**	**08/25/2016**
Parameters	**Units**	**MH Air Tox**	**USEPA Res IA**			
Volatile Organic Compounds						
1,2,4-Trimethylbenzene	µg/m^3	1.12	19	ND(4.9)	ND(4.9)	ND(4.9)
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	N/V	N/V	ND(7.7)	ND(7.7)	ND(7.7)
1,2-Dichloroethane	µg/m^3	0.16	0.2	ND(4.0)	ND(4.0)	ND(4.0)
1,3,5-Trimethylbenzene	µg/m^3	0.38	6.5	ND(4.9)	ND(4.9)	ND(4.9)
Benzene	µg/m^3	2.59	29	ND(3.2)	ND(3.2)	ND(3.2)
Ethylbenzene	µg/m^3	0.68	17	ND(4.3)	ND(4.3)	ND(4.3)
Isopropyl benzene	µg/m^3	11.2	N/V	ND(4.9)	ND(4.9)	ND(4.9)
Methyl tert butyl ether (MTBE)	µg/m^3	N/V	72	ND(3.6)	ND(3.6)	ND(3.6)
Naphthalene	µg/m^3	N/V	4.8*	ND(5.2)	ND(5.2)	ND(5.2)
Toluene	µg/m^3	4.52	144	ND(3.8)	ND(3.8)	ND(3.8)
Xylenes (total)	µg/m^3	3.14	63.5	ND	ND	2.6 J

Notes:

J	Estimated concentration.
ND	Not detected at the associated reporting limit.
N/V	No criteria value.
MH Air Tox	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.

Appendices

Appendix A
Notice of Intent to Remediate, Report Notifications, and Proofs

February 20, 2017 Reference No. 11109613

Sent via Certified Mail: 7014 2870 0002 3444 6893

Ms. Palak Raval-Nelson, MPH, PhD, Director
Environmental Health Services
Philadelphia Department of Public Health
321 University Avenue
Philadelphia, Pennsylvania 19104

Dear Ms. Raval-Nelson:

Re: Notice of Submittal of AOI 6 A Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC
Philadelphia Energy Solutions Refining and Marketing LLC (PES) Refinery
Philadelphia, Philadelphia County, Pennsylvania

Notice is hereby given that Evergreen Resources Group, LLC has submitted a Remedial Investigation Report to the Department of Environmental Protection for Area of Interest 6 (also known as the Girard Point Chemicals Processing Area) at the Philadelphia Energy Solutions refinery at 3144 Passyunk Avenue, Philadelphia, Pennsylvania 19145. The report indicates that the remedial investigation was completed in accordance with the site specific standard.

This notice is made under the provision of the Land Recycling and Environmental Standards Act, the Act of May 19, 1995, P.L. #4, No. 2.

Yours truly,

GHD

Colleen Costello

Colleen Costello

CC/cm/1

cc: David Brown, PG - PADEP
Tiffani Doerr - Evergreen

GHD Services Inc.
410 Eagleview Boulevard Suite 110 Exton Pennsylvania 19341 USA
T 610 321 1800 **F** 610 321 2763 **W** www.ghd.com

ISO 9001

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FEB 27 2017

Ms. Palak Raval-Nelson, PhD, Director
Philadelphia Department of Public Health
321 University Avenue
Philadelphia, PA 19104

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Palak Raval-Nelson, PhD, Director
Philadelphia Department of Public Health
321 University Avenue
Philadelphia, PA 19104

9590 9402 1575 5362 9121 87

2. Article Number *(Transfer from service label)*

7014 2870 0002 3444 6893

PS Form 3811, July 2015 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

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☐ Addressee

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[signature]

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2-23-17

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☑ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

Domestic Return Receipt

Proof of Publication in The Philadelphia Daily News
Under Act. No 587, Approved May 16, 1929

STATE OF PENNSYLVANIA
COUNTY OF PHILADELPHIA

Cindy Jakubowski being duly sworn, deposes and says that **The Philadelphia Daily News** is a newspaper published daily, except Sunday, at Philadelphia, Pennsylvania, and was established in said city in 1925, since which date said newspaper has been regularly issued in said County, and that a copy of the printed notice of publication is attached hereto exactly as the same was printed and published in the regular editions and issues of the said newspaper on the following dates:

March 1, 2017

Affiant further deposes and says that she is an employee of the publisher of said newspaper and has been authorized to verify the foregoing statement and that she is not interested in the subject matter of the aforesaid notice of publication, and that all allegations in the foregoing statement as to time, place and character of publication are true.

Helene Sweeney

Sworn to and subscribed before me this 1st day of March 2017.

Cindy Jakubowski
Notary Public

My Commission Expires:

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
CINDY JAKUBOWSKI, Notary Public
City of Philadelphia, Phila. County
My Commission Expires November 30, 2020

Copy of Notice of Publication

Notice of Report Submittal under an Environmental Standard
(Section 304(n)(2)(i))

Notice is hereby given that Evergreen Resources Group, LLC has submitted a report to the Pennsylvania Department of Environmental Protection, Southeast Regional Office, indicates that planned remediation will attain compliance with the site-specific cleanup standard for Area of Interest 8 (also known as the Girard Point Chemicals Processing Area) at the Philadelphia Energy Solutions refinery located at 3144 Passyunk Avenue, Philadelphia, Pennsylvania 19145. Evergreen Resources Group, LLC has indicated that the remedial investigation was completed in accordance with the site-specific cleanup standard established under the Land Recycling and Environmental Remediation Standards Act.

This notice is made under the provision of the Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. #4, No. 2.

Philadelphia Refinery

Sunoco Inc.
3144 Passyunk Avenue
Philadelphia PA 19145-5299
215 339 2000

October 12, 2006

Mr. Robert Day-Lewis
Pennsylvania DEP
2 East Main Street
Norristown, PA 19401

Mr. Steve O'Neil
Pennsylvania DEP
2 East Main Street
Norristown, PA 19401

Re: Sunoco Inc. (R&M) Philadelphia Refinery
Philadelphia, Philadelphia County

Dear Mr. Day-Lewis and Mr. O'Neil:

In accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2), enclosed are two copies of a Notice of Intent to Remediate (NIR) for the Sunoco Inc. (R&M) Philadelphia Refinery. This NIR covers remediation being done as part of the 2003 Consent Order and Agreement (CO&A) at Point Breeze, Girard Point and Schuylkill River Tank Farm. Remediation at Belmont Terminal, which is part of the CO&A, is not part of this NIR since this site is not subject to RCRA Corrective Action. Sunoco is considering submitting a separate NIR for this area under the Act 2 program only.

This NIR is being submitted with the intent to enter the Sunoco Philadelphia Refinery into the One Cleanup Program with PaDEP and the USEPA. All remediation work at the Philadelphia refinery will be completed under the 2003 Consent Order & Agreement (CO&A), however, RCRA Corrective Action measures will be addressed concurrently with work performed under the CO&A and within the Act 2 program.

Please call me at 610-859-1881 or email me at jroppenheim@sunocoinc.com with any questions or comments.

Best Regards,

James Oppenheim, PE
Sr. Environmental Consultant

Cc: Sunoco Legal Dept.
Philadelphia Refinery Environmental Central File
David Burke, PADEP
Walter Payne, PADEP
Hon Lee, USEPA Region III
Colleen Costello, Langan

2530-FM-BWM0019 Rev. 4/2004

Will remediation be to a site-specific standard ☒ or as a special industrial area ☐? If so, the municipality or municipalities must be provided 30-day comment period.
Remediator/Property Owner/Consultant. For each of these recipients of the approval of the final report, complete form below.

Remediator
Contact Person: James R. Oppenheim
Relationship to site (e.g. owner, remediator, participating in cleanup, consultant): Remediation Project Manager
Phone Number: (610) 859-1881
Company Name: Sunoco, Inc. (R&M)
Address (street, city, state, zip): 100 Green St., Marcus Hook, PA 19061
Email Address: jroppenheim@sunocoinc.com
Property Owner
Contact Person: Scott Baker
Relationship to site (e.g. owner, remediator, participating in cleanup, consultant): Environmental Manager
Phone Number: (215) 339-2074
Company Name: Sunoco, Inc. (R&M)
Address (street, city, state, zip): 3144 Passyunk Ave. Philadelphia, PA 19145
Email Address: sabaker@sunocoinc.com
Consultant
Contact Person: Colleen Costello
Relationship to site (e.g. owner, remediator, participating in cleanup, consultant): Consultant
Phone Number: (215) 864-0640
Company Name: Langan Engineering and Environmental Services
Address (street, city, state, zip): 30 South 17th St., Suite 1500, Philadelphia, PA 19103
Email Address: ccostello@langan.com

Preparer of Notice of Intent to Remediate:

Name: James Oppenheim

Title: Project Manager

Address: 100 Green Street
Marcus Hook, PA 19061

Telephone: (610) 859-1881

Email Address: jroppenheim@sunocoinc.com

Email Image File of Site Map showing property lines and general area of site(s) to be remediated to: (landrecycling@state.pa.us)

Sunoco Inc.
3144 Passyunk Avenue
Philadelphia PA 19145-5299
215 339 2000

October 12, 2006

Manager
Philadelphia Department of Public Health
Environmental Health Services
321 University Avenue
Philadelphia, PA 19104

Re: Sunoco, Inc. (R&M) Philadelphia Refinery
Philadelphia, Philadelphia County

Dear Sir/Madam:

The Land Recycling and Environmental Remediation Standards Act (Act 2) requires that a Notice of Intent to Remediate (NIR) be provided to the municipality in which the site is located when a site is being remediated to a site-specific Standard. The municipality is afforded a 30-day comment period. In accordance with this provision of the Act, Sunoco, Inc. (R&M) is formally notifying you of its intent to remediate the subject site under Act 2. A copy of the NIR, which will be sent to the Pennsylvania Department of Environmental Protection (PaDEP), is enclosed. This notice will also be published in the Pennsylvania Bulletin, and a summary of the notice appeared in the Philadelphia Daily News on October 16, 2006.

Publication of this notice in the Philadelphia Daily News initiates the 30-day public and municipal comment period. During the next thirty days, your municipality may request to become involved in the development of the remediation plans for the site. If the municipality wishes to become involved in this project, please send your comments to Sunoco to my attention.

Please call me at (610) 859-1881 if you have any questions concerning the proposed remediation.

Best Regards,

James R. Oppenheim, P.E.
Senior Environmental Consultant

Cc: Sunoco Legal Dept.
Philadelphia Refinery Environmental Central File
Steve O'Neil, PaDEP
Colleen Costello, Langan

Will remediation be to a site-specific standard ☒ or as a special industrial area ☐? If so, the municipality or municipalities must be provided 30-day comment period.
Remediator/Property Owner/Consultant. For each of these recipients of the approval of the final report, complete form below.

Remediator
Contact Person: James R. Oppenheim
Relationship to site (e.g. owner, remediator, participating in cleanup, consultant): Remediation Project Manager
Phone Number: (610) 859-1881
Company Name: Sunoco, Inc. (R&M)
Address (street, city, state, zip): 100 Green St., Marcus Hook, PA 19061
Email Address: jroppenheim@sunocoinc.com
Property Owner
Contact Person: Scott Baker
Relationship to site (e.g. owner, remediator, participating in cleanup, consultant): Environmental Manager
Phone Number: (215) 339-2074
Company Name: Sunoco, Inc. (R&M)
Address (street, city, state, zip): 3144 Passyunk Ave. Philadelphia, PA 19145
Email Address: sabaker@sunocoinc.com
Consultant
Contact Person: Colleen Costello
Relationship to site (e.g. owner, remediator, participating in cleanup, consultant): Consultant
Phone Number: (215) 864-0640
Company Name: Langan Engineering and Environmental Services
Address (street, city, state, zip): 30 South 17th St., Suite 1500, Philadelphia, PA 19103
Email Address: ccostello@langan.com

Preparer of Notice of Intent to Remediate:

Name: James Oppenheim

Title: Project Manager

Address: 100 Green Street
Marcus Hook, PA 19061

Telephone: (610) 859-1881

Email Address: jroppenheim@sunocoinc.com

Email Image File of Site Map showing property lines and general area of site(s) to be remediated to: (landrecycling@state.pa.us)

Proof of Publication in The Philadelphia Daily News
Under Act. No 587, Approved May 16, 1929

STATE OF PENNSYLVANIA
COUNTY OF PHILADELPHIA

Anna Dickerson being duly sworn, deposes and says that **The Philadelphia Daily News** is a newspaper published daily, except Sunday, at Philadelphia, Pennsylvania, and was established in said city in 1925, since which date said newspaper has been regularly issued in said County, and that a copy of the printed notice of publication is attached hereto exactly as the same was printed and published in the regular editions and issues of the said newspaper on the following dates:

October 16, 2006

Affiant further deposes and says that he is an employee of the publisher of said newspaper and has been authorized to verify the foregoing statement and that he is not interested in the subject matter of the aforesaid notice of publication, and that all allegations in the foregoing statement as to time, place and character of publication are true.

Anna Dickerson

Sworn to and subscribed before me this 16th day of October, 2006

Mary Anne Logan
Notary Public

My Commission Expires:

NOTARIAL SEAL
Mary Anne Logan, Notary Public
City of Philadelphia, Phila. County
My Commission Expires March 30, 2009

Copy of Notice of Publication

Newspaper Notice of Intent to Remediate to an Environmental Standard. (Sections 302(e)(1)(ii), 303(h)(1)(ii), 304(n)(1)(i), and 305(c)(1))

Pursuant to the Land Recycling and Environmental Remediation Standards Act (Act), the act of May 19, 1995, P.L. 4, No. 1995-2, notice is hereby given that Sunoco Inc.(R&M) has submitted to the Pennsylvania Department of Environmental Protection a Notice of Intent to Remediate a site located at 3144 Passyunk Ave., Philadelphia, Philadelphia County, Pennsylvania. This Notice of Intent to Remediate states that the site is a petroleum refinery. It has been determined that petroleum compounds have impacted soil and groundwater at the site. Sunoco Inc. (R&M) has indicated that proposed remediation measures will include source reduction and engineered boundary controls. The proposed future use of the property is industrial for continued operation as a petroleum refinery.

Sunoco Inc. (R&M) plans to use the site-specific remediation standard at the site. The Act provides for a 30-day public comment period for site-specific standard remediation. The 30-day comment period is initiated with the publication of this notice. Until November 16, 2006, the City of Philadelphia may submit a request to Sunoco Inc. (R&M) to be involved in the development of the remediation and reuse plans for the site. The City of Philadelphia may also submit a request to Sunoco Inc. (R&M) during this 30-day comment period to develop and implement a public involvement plan. Copies of these requests and of any comments should also be submitted to the Department of Environmental Protection at 2 East Main Street, Norristown, PA 19401 to the attention of Mr. Walter Payne. All correspondence with Sunoco Inc. (R&M) should be addressed to the Public Relations Dept., Sunoco Inc. (R&M) at 3144 Passyunk Ave, Philadelphia, PA, 19145.

LEGAL NOTICES

Newspaper Notice of Intent to Remediate
to an Environmental Standard.
(Sections 302(e)(1)(ii), 303(h)(1)(ii),
304(n)(1)(i), and 305(c)(1))

Pursuant to the Land Recycling and Environmental Remediation Standards Act (Act), the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Sunoco Inc.(R&M) has submitted to the Pennsylvania Department of Environmental Protection a Notice of Intent to Remediate a site located at 3144 Passyunk Ave., Philadelphia, Philadelphia County, Pennsylvania. This Notice of Intent to Remediate states that the site is a petroleum refinery. It has been determined that petroleum compounds have impacted soil and groundwater at the site. Sunoco Inc. (R&M) has indicated that proposed remediation measures will include source reduction and engineered boundary controls. The proposed future use of the property is industrial for continued operation as a petroleum refinery.

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Appeared in: ***Philadelphia Inquirer & Philadelphia Daily News*** on Monday, 10/16/2006

Back

Evergreen Resources Management
2 Righter Parkway, Suite 200
Wilmington, DE 19803

November 17, 2014

Mr. C. David Brown, Ph. D., PG
Department of Environmental Protection
2 East Main Street
Norristown, PA 19401

RE: Philadelphia Energy Solutions Refining & Marketing LLC (PES) Philadelphia Refinery Complex
3144 West Passyunk Avenue, Philadelphia, Philadelphia County, Pennsylvania

Dear Mr. Brown:

In accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2), enclosed is the revised Notice of Intent to Remediate (NIR) for the Philadelphia Refinery Complex (site). The original NIR for the site was submitted on October 12, 2006. The purpose of this revision is to update owner and remediator information for the facility. This revision also includes a site location map depicting a change to property boundaries, most notably the exclusion of Belmont Terminal, which was covered under a separate NIR submission on October 6, 2014. It should be noted that the Belmont Terminal was not included in the original October 12, 2006 NIR, therefore, its exclusion from the revised NIR is not a change.

On August 14, 2012, Sunoco, Inc. (R&M) (Sunoco) entered into a Consent Order and Agreement with Philadelphia Energy Solutions Refining & Marketing LLC (PES) and the Pennsylvania Department of Environmental Protection (PADEP) for the Philadelphia Refinery Complex. As part of this buyer-seller agreement, Sunoco retained responsibility of remediation activities for environmental conditions existing at the time of the transfer, and PES is responsible for environmental conditions following the purchase agreement. On September 8, 2012, Sunoco conveyed the Philadelphia Refinery to PES. Effective December 30, 2013, "Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC" (Evergreen) assumed Sunoco legacy remediation liabilities with respect to the Philadelphia Refinery Complex. Evergreen will continue to manage the remediation work at the facility under the One Cleanup Program with the PADEP and United States Environmental Protection Agency (USEPA) and in accordance with 2012 Consent Order & Agreement.

Please call me at (302) 477-0192 with any questions or comments.

Best Regards,

James Oppenheim, PE
Vice President

cc: Evergreen File
Charles Barksdale, Philadelphia Energy Solutions Refining and Marketing, LLC
Jennifer Menges, Stantec Consulting Services Inc.

8000-FM-CRLG0010 Rev. 9/2010

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMUNITY REVITALIZATION AND LOCAL GOVERNMENT SUPPORT

For DEP Use Only
PF #_____
Rem ID #_____

NOTICE OF INTENT TO REMEDIATE

Act 1995-2 requires four general information items to be included in the NIR: the general location, listing of contaminants, intended use of property, and proposed remediation measures. In addition, indicate the standard(s) to be obtained (if known) and attach a scaled site map (if available).

Property Name Philadelphia Energy Solutions Refining & Marketing LLC (PES) Philadelphia Refinery Complex

Former Name(s) / AKA Sunoco Inc. (R&M) Philadelphia Refinery

Address / Location 3144 Passyunk Avenue

City Philadelphia Zip Code 19145

Municipality(s) City of Philadelphia County(ies) Philadelphia

Latitude 39 º (deg). 55 ‘ (min) 13.976 “ (sec) Longitude 75 º (deg). 11 ‘ (min) 52.429 “ (sec)

Horizontal Collection Method Geographic Information Systems

Horizontal Reference Datum NAD 1983 Reference Point Visitor Entrance

☒ Wish to participate in the DEP/EPA MOA. Contact Troy Conrad at tconrad@state.pa.us for details.

EPA ID#, if known PAD049791098

DEP ID#(s), if known Multiple
(i.e., eFACTS site ID#, storage tank facility ID#, water quality permit #, watershed permit, air quality permit #, etc.)

Date Release Occurred (if known) _____

Provide a brief description of the site contamination in plain language (e.g. fuel oil spill, historical chemical industrial area contamination), the names of any know primary contaminants to be addressed, and the intended future use of the property.

The site contamination consists of impacts to soil and groundwater associated with historic petrochemical refining operations. The primary consistuents of concern in soil and groundwater are lead, 1,2-dichloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, cumene, ethylbenzene, methyl tertiary butyl ether, toluene, total xylenes, ethylene dibromide, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluorene, naphthalene, phenanthrene, and pyrene. The future use of the facility is to remain industrial.

Provide a general description of proposed remediation measures.

Evergreen is submitting this Notice of Intent to Remediate (NIR) in order update an NIR previously submitted on October 6, 2006 which formally entered the property into the PA Act 2 Program. In November 2011, the facility was formally entered into the PA One Cleanup Program with the USEPA and PADEP. The purpose of this NIR revision is to update the facility ownership and remediator information. The facility has been divided into 11 Areas of Interest (AOIs). These areas consist of the Point Breeze Processing Area North Yard (AOI 8) and South Yards (AOI 1 through AOI 4); the Girard Point South Tank Field (AOI 5) and Processing Area (AOI 6 and AOI 7); the Schuylkill River Tank Farm (AOI 9); the West Yard (AOI 10); and the deep aquifer (AOI 11). Each AOI will be characterized in accordance with PA Act 2, and remedial measures will be developed to address the risk of exposure identified during

the characterization activities.

Remediation Standard(s) planned (if known at this time):

☐ Unknown at this time	☐ Soil	☐ Groundwater
☐ Background Contaminants:	☐ Soil	☐ Groundwater
☐ Statewide Health - Residential Contaminants:	☐ Soil	☐ Groundwater
☐ Statewide Health – Non-Residential Contaminants:	☐ Soil	☐ Groundwater
☒ Site Specific Contaminants:	☒ Soil	☒ Groundwater
☐ Special Industrial Area* Contaminants:	☐ Soil	☐ Groundwater

*NOTE: Specific standard or Special Industrial Area require a 30-day municipal comment period

Remediator / Property Owner / Consultant. Complete the form below for *each* recipient obtaining a release of liability upon approval of the final report. Attach additional sheets as necessary.

Remediator

Contact Person/Title Jim Oppenheim, PE/Vice President eFACTS Client ID* 314958

Relationship to Site Remediator Client Type* Limited Liability Company
(e.g. owner, remediator, participant in cleanup, consultant, etc.)

Phone Number (302) 477-0192 Email Address JROPPENHEIM@evergreenresmgt.com

Company Name Evergreen Resources Management Operations EIN or Federal ID # 46-4184955

Address (street, city, state, zip) 2 Righter Parkway, Suite 200, Wilmington, DE 19803

Property Owner

Contact Person/Title Charles Barksdale Jr./Site Environmental Director eFACTS Client ID* 298341

Relationship to Site Owner Client Type* Limited Liability Company
(e.g. owner, remediator, participant in cleanup, consultant, etc.)

Phone Number 215-339-2074 Email Address charles.barksdale@pes-companies.com

Company Name Philadelphia Energy Solutions Refining and Marketing, LLC EIN or Federal ID # 61-168974

Address (street, city, state, zip) 3144 Passyunk Ave, Philadelphia, PA 19145

Consultant

Contact Person/Title Jennifer Menges/Principal Consultant, LRS eFACTS Client ID* N/A

Relationship to Site Consultant Client Type* N/A
(e.g. owner, remediator, participant in cleanup, consultant, etc.)

Phone Number (610) 840-2540 Email Address Jennifer.Menges@stantec.com

Company Name Stantec EIN or Federal ID # N/A

Address (street, city, state, zip) 1060 Andrew Drive, Suite 140, West Chester, PA 19380

*Include eFACTS Client ID (if known) – "Client Types" below:

Association/Organization	Limited Liability company	Partnership-General
Authority	Limited Liability Partnership	Partnership-Limited
County	Municipality	School District
Estate/Trust	Non-Pennsylvania Government	Sole Proprietorship
Federal Agency	Other (Non-Government)	State Agency
Individual	Pennsylvania Corporation	

Preparer of Notice of Intent to Remediate

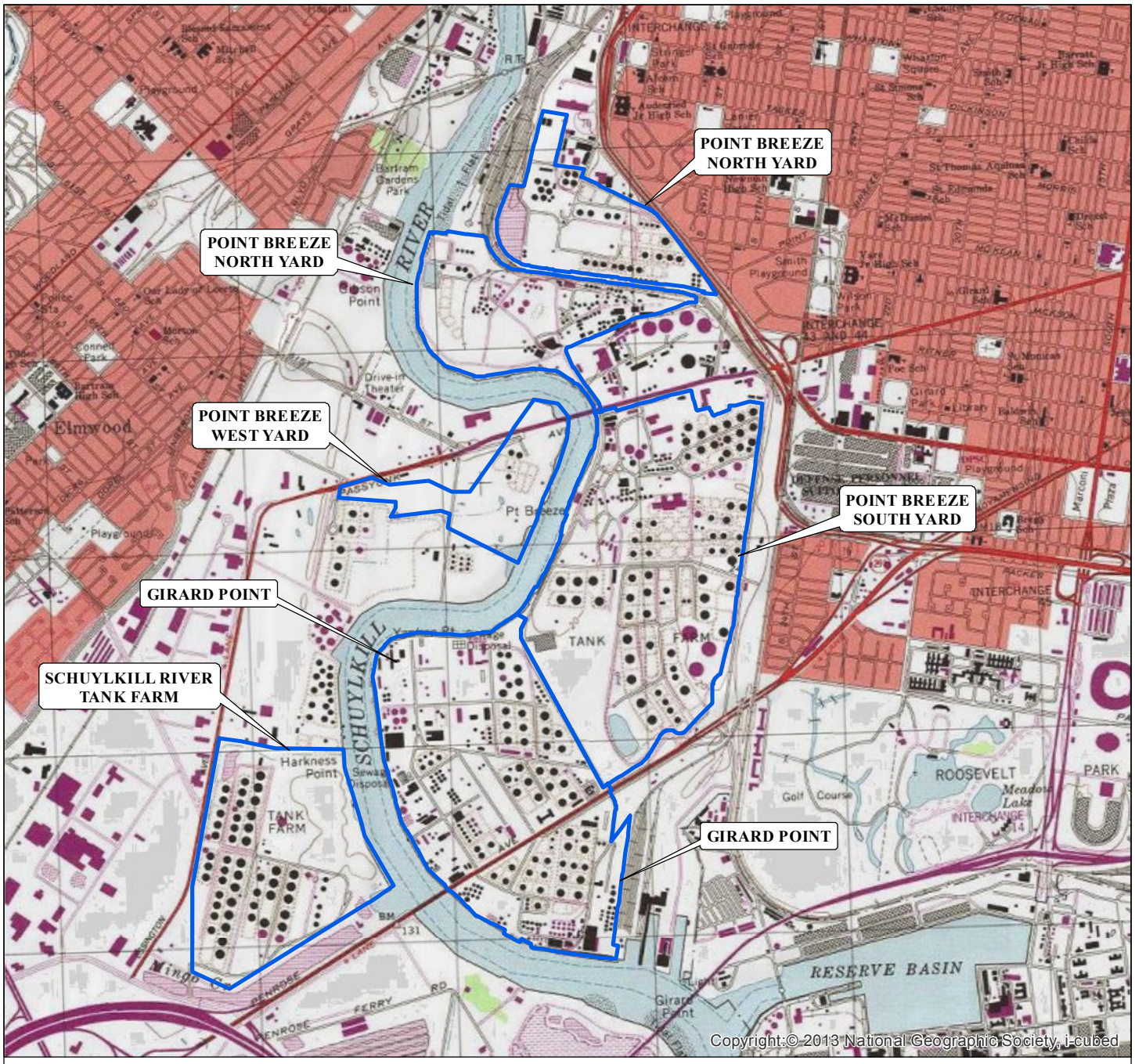
Name Jim Oppenheim, PE Title Vice President

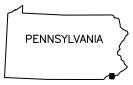
Phone Number (302) 477-0192 Email Address JROPPENHEIM@evergreenresmgt.com

Company Name Evergreen Resources Management eFACTS Client ID

Operations

Address (street, city, state, zip) 2 Righter Parkway, Suite 200, Wilmington, DE 19803





QUADRANGLE LOCATION

0 750 1,500 3,000 4,500 Feet

N

REFERENCE: USGS 7.5 MINUTE QUADRANGLE; PHILADELPHIA, PA.-NJ, QUADRANGLE, 1995

Stantec

Stantec Consulting Services Inc.
1060 Andrew Drive, Suite 140
West Chester, Pennsylvania 19380
Tel. 610-840-2500
Fax. 610-840-2501
www.stantec.com

DRAWN BY: GWC
CHECKED BY: JKD
APPROVED BY: JLM
DATE: 11/11/2014

Prepared For:

EVERGREEN RESOURCES MANAGEMENT OPERATIONS
PHILADELPHIA REFINERY COMPLEX
3144 PASSYUNK AVENUE
PHILADELPHIA, PA. 19145

Figure Title:

Philadelphia Refinery Complex
Site Location Map

Figure No.:

1

Evergreen Resources Management
2 Righter Parkway, Suite 200
Wilmington, DE 19803

November 17, 2014

Leigh Anne Rainford, MPH
Sanitarian Supervisor
Philadelphia Department of Public Health
Environmental Engineering Section
321 University Avenue
Philadelphia, PA 19104

RE: Philadelphia Energy Solutions Refining & Marketing LLC (PES) Philadelphia Refinery Complex
3144 West Passyunk Avenue Philadelphia, Philadelphia County

Dear Ms. Rainford:

The Land Recycling and Environmental Remediation Standards Act (Act 2) requires that a Notice of Intent to Remediate (NIR) a site be provided to the municipality in which the site is located. This notification is to inform the City of Philadelphia of the submission of an update to the original October 12, 2006 NIR. The purpose of the revised NIR is to update the facility owner and remediator information. On September 8, 2012, Sunoco Inc., (R&M) (Sunoco) conveyed the Philadelphia Refinery to Philadelphia Energy Solutions Refining & Marketing LLC (PES). As part of the transaction, Sunoco retained responsibility for remediation activities for environmental conditions existing at the time of the transfer. Effective December 30, 2013, "Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC" (Evergreen) assumed Sunoco legacy remediation liabilities with respect to the Philadelphia Refinery Complex. A copy of the revised NIR is enclosed for your reference.

Please call me at (302) 477-0192 if you have any questions concerning the proposed remediation.

Best Regards,

James Oppenheim, PE
Vice President

cc: Evergreen File
C. David Brown, PADEP
Charles Barksdale, Philadelphia Energy Solutions Refining and Marketing, LLC
Jennifer Menges, Stantec Consulting Services Inc.

Appendix B
Quality Assurance/Quality Control Plan and Field Procedures Manual

Quality Assurance/Quality Control Plan

Marcus Hook Industrial Complex and Philadelphia Energy Solutions (PES) – Philadelphia Refinery

Evergreen

GHD

410 Eagleview Boulevard, Suite 110 Exton Pennsylvania 19341 United States

11102641 | Report No 1 | April 4, 2016

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1. Introduction

This Quality Assurance/Quality Control (QA/QC) Plan outlines the procedures developed to ensure the collection and analysis of quality data for the completion of investigations completed under the United States Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCRA) program, Pennsylvania Department of Environmental Protection (PADEP) Act 2 program and Pennsylvania and Delaware's Tank programs at the Marcus Hook Industrial Complex (MHIC) and the Philadelphia Energy Solutions – Philadelphia Refinery (PES Refinery). This document shall be used in conjunction with the Site-Specific Work Plans and Standard Operating Procedures (SOPs) prepared for each site.

The QA/QC Plan is a planning document that provides a "blueprint" for obtaining the type and quality of data needed to support environmental decision making. The QA/QC Plan integrates relevant technical and quality aspects of a project and documents quality assurance and quality control.

2. Quality Control Requirements

The field and laboratory QC requirements for the monitoring activities are discussed in the following subsections. Specific QC checks and acceptance criteria are provided in the referenced analytical methods.

2.1 Field Sampling Quality Control

Field QC requirements include analyzing reference standards for instrument calibration and for routine calibration checks. Field QC samples for this project include, field duplicate samples to assess the overall precision of the sampling and analysis event, equipment rinse blanks to ensure proper cleaning of equipment is conducted between samples to avoid potential cross-contamination, and trip blank samples to monitor cross-contamination of water samples by VOCs. The frequency of collection of these field QC samples is summarized in the Site Specific Field Activities and SOPs, to reflect that a duplicate will be collected 1 in 20 samples and a trip blank will be collected per every sample shipment (cooler).

2.2 Analytical Quality Control

The laboratory QC requirements for the analyses include analyzing method blanks, instrument performance checks, initial calibration standards, calibration verification standards, internal standards, surrogate compound spikes, interference check samples, serial dilution samples, MS/MSD samples, and LCSs. The acceptance criteria for MS/MSD, LCSs, and surrogate compounds will be generated by the laboratory and included in the laboratory reports.

3. Data Verification/Validation and Usability

All field and laboratory data will be reviewed, verified, and/or validated. These terms are defined as follows:

- Data review is the in-house examination to ensure that the data have been recorded, transmitted, and processed correctly.
- Data verification is the process for evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual specifications.
- Data validation is an analyte- and sample-specific process that extends the evaluation of data beyond method, procedure, or contractual compliance (i.e., data verification) to determine the quality of a specific data set relative to the end use.

Field data and logbooks may be reviewed to ensure that the requirements of the sampling program, including the number of samples and locations, sampling, and sample handling procedures, were fulfilled.

Data verification/validation and usability assessments will be performed to ensure that the data are scientifically defensible, properly documented, of known quality, and meet the project objectives are described in the following sections.

3.1 Laboratory Data Review, Verification, and Validation Requirements

Data review, verification and validation of the analytical data will be performed by each Consultant completing the field activities. The evaluation and action criteria specified in this document will be used for validating the data. Qualifiers assigned to the data will be consistent with the data qualifiers specified in the validation guideline.

Stage 1 Verification and Validation Checks

One hundred percent of the sample results will go through a Stage 1 validation (verification). As part of the data management process, each consultant will complete verification based on the Superfund Guidance for Labeling Externally Validated Laboratory Analytical Data (http://www.epa.gov/superfund/policy/pdfs/EPA-540-R-08-005.pdf). Data verification will consist of the following items based on the guidance stated.

Stage 1 validation of the laboratory analytical data package consists of verification and validation checks for the compliance of sample receipt conditions, sample characteristics (e.g., percent moisture), and analytical results (with associated information). It is recommended that the following minimum baseline checks (as relevant) be performed on the laboratory analytical data package received for a Stage 1 validation label:

1. Documentation identifies the laboratory receiving and conducting analyses, and includes documentation for all samples submitted by the project or requester for analyses.
2. Requested analytical methods were performed and the analysis dates are present.

3. Requested target analyte results are reported along with the original laboratory data qualifiers and data qualifier definitions for each reported result (and the uncertainty of each result and clear indication of the type of uncertainty reported if required).
4. Requested target analyte result units are reported (along with their associated uncertainty units if required).
5. Requested reporting limits for all samples are present and results at and below the requested (required) reporting limits are clearly identified (including sample detection limits if required).
6. Sampling dates (including times if needed), date and time of laboratory receipt of samples, and sample conditions upon receipt at the laboratory (including preservation, pH and temperature) are documented.
7. Sample results are evaluated by comparing sample conditions upon receipt at the laboratory (e.g., preservation checks) and sample characteristics (e.g., percent moisture) to the requirements and guidelines present in national or regional data validation documents, analytical method(s) or contract.

Stage 2 Verification and Validation Checks

A minimum of 10 percent of the samples will go through a Stage 2 validation. When a laboratory work order is selected, the entire work order will undergo Stage 2 validation. A minimum of 10 percent of the samples will be flagged for VUA. Laboratory work orders or sample delivery groups (SDGs) that are selected for VUA will undergo validation based on the Superfund Program's National Functional Guidelines.

The selection of samples that will undergo VUA process is designed to meet the needs of the site investigation, characterization, remediation, and closure programs, such as tank closures. Sampling that falls outside these programs will not undergo the VUA process. This includes samples that are collected for permit compliance, such as RCRA and effluent wastewater, as well as product samples, onsite soil reuse samples, and waste characterization samples.

Ten percent of samples will be selected based on the following hierarchy:

1. Sample package that will be selected will contain a field duplicate sample.
2. Sample package will be selected at random.

Samples that are collected in the field will provide the best information for completing the VUA reports. The hierarchy is designed to provide the most useful information regarding sample analysis integrity. Therefore, field duplicate samples have been assigned the highest priority. However, field duplicate samples will only be prepared for groundwater samples, not for soil sampling events. If there are insufficient field duplicate samples to meet the 10 percent goal, samples with field blanks will be selected. Sample selection will be a subset of samples collected for a characterization or closure events and will be calculated by taking 10 percent of the number of samples collected. For program efficiency, entire SDGs will be selected for submission in the VUA process. Individual samples should not be selected and processed unless there is an overriding reason to do so. The exception to this scenario will be Aquaterra, where the consultant company working with Aquaterra will validate the samples collected by them.

Stage 2 data validation includes a review of the following QC data deliverables:

1. Technical Holding Times
2. Method Blanks
3. Surrogate Spikes
4. MS/MSD Results
5. LCS Samples
6. Field Duplicates
7. Trip and Equipment Blank Samples

Stage 4 Verification and Validation Checks

Additional data validation may be completed for selected sites and/or sampling events, up to EPA Level 4 data review, which includes all of the elements of a Stage 2 Validation and

1. Evaluation of instrument performance checks (GC/MS)
2. Initial and continuing calibration checks (organic and inorganic analyses)
3. Review of internal standards (GC/MS)
4. Instrument blanks (inorganics)
5. Interference check samples (metals)
6. Recalculations of sample results and reporting limits.

3.2 Groundwater Sampling Methods

Company specific valid codes will be added to the database. This will allow quick identification of the consultant that has performed the verification and/or VUA. Stantec may append additional codes for data management purposes to the codes provided in dt_result table approval_code field. Valid codes are as follows:

Langan:

- LAN1 – Historical data collected by Langan - Level 1 Validation (Verification)
- LAN-VER – Langan performed verification
- LAN-USB – Langan performed usability

GHD:

- GHD-VER – GHD performed verification
- GHD-USB – GHD performed usability

Stantec:

- STN-VER – Stantec performed verification
- STN-USB – Stantec performed usability

This methodology creates a means for consultants to perform verification and usability on data collected by another consultant.

3.3 Data Updates in the Electronic Data Deliverables

All consultants will request EQuIS 4 file format Electronic Data Deliverables (EDDs) for data management from the analytical laboratories. In order to facilitate the data updates in the database, the following methodology is proposed.

1. The consultant chemist / chemist team will open the .RES file for the EDD that has been selected to be validated for usability. The file can be opened using Excel, Access, Notepad or similar tool. Although, it is a best practice to open the file in a way to preserve the textual nature of the EDD, it is unnecessary to do it in this case.
2. The chemist will use the result_comment field in the .RES file to enter the qualifiers associated with the record and add a semicolon as a delimiter (;) followed by the reason code for the qualification (e.g., U;SUR).
3. The .RES file is to be saved with a .USB extension at the end of the file. This file is to be separate from the original .RES file provided and should not be used to over-write the original .RES file that was sent with the EDD. This will result in the laboratory work order undergoing VUA having five files instead of four for the EDD. For example:
    - 1234.SMP
    - 1234.TST
    - 1234.BCH
    - 1234.RES
    - 1234.RES.USB
4. Stantec will use the fifth file to update the database with the appropriate qualifiers and codes in validator_qualifiers and approval_a through approval_d fields in dt_result table in the database.
5. Stantec will also change the validated y/n field in dt_result table in the database for the particular EDD.

3.4 Validation Qualifiers

The following qualifiers should be used during the validation/usability process. These are based on the NFGs and commonly used qualifiers.

Data Qualifiers and Definitions

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ The analyte has been "tentatively identified" or "presumptively identified" as present and the associated numerical value is the estimated concentration in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

B The analyte was detected in the method, field, and/or trip blank.

If additional qualifiers are required, please forward the suggestions to the Stantec PM (Jennifer Menges) or the Stantec Data Management Lead (Andrew Bradley), and they will be added to the list of approved codes.

Reason codes

A list of reason codes are available for validation. If additional codes are required, please forward the suggestions to the Stantec PM (Jennifer Menges) or the Stantec Data Management Lead (Andrew Bradley) for addition to the list of approved codes.

Submitting data, Validation CODES for inclusion in the database

EDDs will be submitted to the database using the SharePoint portal intake forms. The appropriate qualifiers and codes that have been added to the result_comment field in the .RES.USB file will be included in the submission.

Data Usability Report

Data usability reports will be generated as required for characterization or final reporting to the agencies. Each consultant will be responsible for their own VUA report. A VUA report template will be created for consistency in reporting. The template will be completed using the Data Usability Checklist completed by the chemist.

Revision History

Revision Record			
Revision	Description	Prepared By	
1.0	Initial creation of document	Gus Sukkurwala/Jennifer Menges/ Andrew Bradley	5/31/2015

Reason Codes

Reason Code	Reason Description
General Use	
EC	Result exceeds the calibration range.
HT	Holding time requirement was not met
MB	Method blank or preparation blank contamination
LCS	Laboratory control sample evaluation criteria not met
FB	Field blank contamination
RB	Rinsate blank contamination
SQL	The analysis meets all qualitative identification criteria, but the measured concentration is less than the reporting limit.
FD	Field duplicate evaluation criteria not met
TvP	Total to Partial criteria not met
RL	Reporting limit exceeds decision criteria (for non-detects)

Reason Code	Reason Description
Inorganic Methods	
ICV	Initial calibration verification evaluation criteria not met
CCV	Continuing calibration verification evaluation criteria not met
CCB	Continuing calibration blank contamination
PB	Preparation Blank
ICS	Interference check sample evaluation criteria not met
D	Laboratory duplicate or spike duplicate precision evaluation criteria not met
MS	Matrix spike recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correction coefficient _0.995
DL	Serial dilution results did not meet evaluation criteria
Organic Methods	
TUNE	Instrument performance (tuning) criteria not met
ICAL	Initial calibration evaluation criteria not met
CCAL	Continuing calibration evaluation criteria not met
SUR	Surrogate recovery outside acceptance range
MS/SD	Matrix spike/matrix spike duplicate precision criteria not met
MS	Matrix spike recovery outside acceptance range
IS	Internal standard evaluation criteria not met
LM	The PFK lock mass SICPs indicate that ion suppression evident
ID	Target compound identification criteria not met
Results Reported for Analytes Analyzed Multiple Times	
NSR	Not selected for reporting because the result was qualified as unusable
NSDL	Not selected for reporting because diluted resulted was selected for reporting
NSQ	Not selected for reporting because result was lesser quality based on data validation
NSO	Not selected for reporting because of other reason
Bias Codes	
H	Bias in sample result likely to be high
L	Bias in sample result likely to be low
I	Bias in sample result is indeterminate

3.5 Verification and Validation Summary

Field data will be verified by reviewing field documentation and chain-of-custody records. Data from direct-reading field instruments will be verified by reviewing calibration and operating records and the QC data specified in this QA/QC Plan.

Verification of sample collection procedures consists of reviewing sample collection documentation for compliance with the requirements of the workplan and QA/QC Plan. If alternate sampling procedures were used, the acceptability of the procedure will be evaluated to determine the affect on the usability of the data. Data usability will not be affected if the procedure used is determined to be an acceptable alternative that fulfills the measurement performance criteria in this QA/QC Plan.

The results of the data verification/ validation procedure will identify data that do not meet the measurement performance criteria of this QA/QC Plan. Data verification/validation will determine whether the data are acceptable, of limited usability (qualified as estimated), or rejected. Data

qualified as estimated will be reviewed and a discussion of the usability of estimated data will be included in the data validation report.

Data determined to be unusable may require corrective action to be taken. Potential types of corrective action may include resampling by the field team or reanalysis of samples by the laboratory. The corrective actions taken are dependent upon the ability to mobilize the field team and whether or not the data are critical for project DQOs to be achieved.

3.6 Verification and Validation Summary

Data use limitations will be identified in data usability write up. Field information will be reviewed to ensure that all sampling procedures and field measurements were conducted in accordance with the requirements of the Site Specific Field Activities and SOPs. Field measurements obtained or data from samples collected using procedures inconsistent with the requirements of the Site Specific Field Activities and SOPs will be evaluated and may require that additional samples are collected or the use of the data be restricted.

EVERGREEN FIELD PROCEDURES
PHILADELPHIA REFINERY COMPLEX
PHILADELPHIA, PENNSYLVANIA

1. LIQUID LEVEL ACQUISITION

Responsible Personnel: Technicians and Geologists

Training Qualifications:

All field personnel involved in liquid level acquisition shall have, as a minimum, completed OSHA 40 HOUR HAZWOPER training, PSM training, and obtained a TWIC Card as well as completing the 3-day minimum field training requirements as specified within the Corporate Health and Safety Plan. Prior to solo performance of liquid levels, all field personnel will have performed a minimum of three site visits under the direct supervision of experienced personnel.

Health and Safety Requirements:

Personal Protective Equipment (PPE) Required:

Level D attire including steel toe/steel shank boots, NOMEX coveralls, and an H2S meter are required to be worn. Based on site conditions, Level C attire may be required. The PPE required to upgrade to Level C may include: nitrile gloves, disposable outerboots, Tyvek coveralls, and a respirator. Safety glasses or hard hats may also be required in certain areas.

Site Controls:

Safety cones and or caution tape should be used in high traffic areas. The "Buddy System" may also be employed in high traffic areas.

Potential Hazards:

Traffic, pinch and trip, chemical (airborne and physical contact) and biological are all likely hazards to be encountered on-site. Additional hazards are mentioned in the site-specific HASP.

Materials and Equipment Necessary for Task Completion:

Electronic oil/water interface probe or conductivity water line, decontamination supplies (liquinox, deionized-distilled water, appropriate containers, scrub brush, and sorbent pads or paper towels), and air monitoring instruments (optional, based on previous site visits).

Methodology:

The task involves the deployment of a liquid sensing probe into a well (in most cases), recording the reading, and decontaminating the probe. The recorded field readings can then be utilized for one of several applications including: well sampling, water table gradient mapping, separate-phase hydrocarbon occurrence, thickness, and or gradient mapping, and various testing procedures.

The proper procedure for liquid level acquisition from a well is as follows:

1) The wells should be gauged in order of least to most contaminated based on existing sampling data or separate-phase hydrocarbon occurrence.
2) The gauging instrument is decontaminated prior to initial deployment and after each well to prevent cross contamination between wells.
3) Decontamination procedures include the following steps:
    a) Remove gross contaminants with sorbent pad or towel.
    b) Rinse/scrub equipment with water.
    c) Scrub equipment in Liquinox®/deionized-distilled water solution.
    d) Double rinse with deionized-distilled water.
    e) Air dry.
4) The well(s) to be gauged may need to be marked off with safety cones and or caution tape in order to protect personnel from auto traffic; the "Buddy System" may also be employed.
5) The manhole cover is then lifted off of the well head. A pry bar may be needed to prevent personal injury in the case of large manhole covers.
6) The probe is lowered into the well until the instrument signals contact with liquid.
7) The corresponding reading is recorded when the instrument signals either water or product. A clear bailer may be used to verify the existence or approximate amount and appearance of product.
8) The probe is then retracted from the well and decontaminated accordingly.
9) The well is then secured appropriately.
10) Note the start and stop time for gauging round in the field book.

2. GROUNDWATER MONITORING PROCEDURES

Responsible Personnel: Technicians and Geologists

Health and Safety Requirements:

Site specific HASP must be completed and reviewed by field personnel. Ambient air monitoring will be performed quarterly at all treatment areas to determine the necessity of PPE upgrade. As a minimum, level "D" attire will be worn.

Training Qualifications:

All field personnel involved in groundwater monitoring shall have, as a minimum completed OSHA 40 HOUR HAZWOPER training and completed the 3 day minimum field training requirements. Prior to groundwater monitoring, all field personnel will have sampled a minimum of three sites under the direct supervision of experienced personnel. Field personnel will also have experience in vapor monitoring techniques and sampling equipment decontamination.

Materials and Equipment Necessary for Task Completion:

A list of equipment required to access, gauge, purge, and sample site monitoring wells is presented below. Also listed are materials necessary to store, label, preserve, and transport groundwater samples.

- Current site map detailing well locations;
- Field data book for recording site data;
- Liquid level gauging device (graduated, optical interface probe);
- Keys and tools to provide well access;
- Appropriate sample containers and labels: volatile samples will be collected in laboratory provided 40 milliliter (ml) glass vials with plastic caps fitted with Teflon ® lined septa; all sample bottles will be laboratory sterilized and will contain the appropriate preservative, if applicable;
- Appropriate well purging apparatus as determined by volume of groundwater to be purged and compounds to be analyzed;
- Teflon ® (or equivalent) bottom-loading bailer to extract groundwater sample;
- Clean nylon or polypropylene bailer cord;
- Disposable nitrile sampling gloves;
- Decontamination supplies;
- Calibrated five-gallon bucket and watch or stopwatch to determine discharge rate during purging;

- Blank chain-of-custody forms; and
- Cooler and ice for sample preservation.

Methodology for Three Well Volume Sampling:

Prior to actual site visitation for the groundwater sampling event, the following data will be reviewed to ensure proper preparation for field activities:

- Most recent liquid level data from all wells;
- Most recent analytical data from all wells to determine gauging and sampling sequence; and
- Well construction characteristics.

Each monitoring well to be sampled will be gauged to obtain liquid level data immediately prior to initiation of the sampling process. Refer to Liquid Level Gauging SOP for appropriate well gauging procedures. Liquid level data will be recorded in a field book. Should free-phase petroleum product be detected by the gauging process and verified through inspection in a pre-cleaned acrylic bailer, groundwater sampling will not be conducted at that location.

The sampling procedure will be initiated by purging from the well a minimum of three well volumes, except in cases where the well is pumped dry, as referenced below. Well purging is performed to remove stagnant water and to draw representative water from the aquifer into the well for subsequent sampling and analysis for the established parameters. In extreme cases where a well is pumped dry and/or shows little recharge capacity, the well will be evacuated once prior to sample procurement. Well volume calculations will be based on total well depth as determined during well installation and depth-to-water measurements obtained immediately prior to sampling.

Down-hole pre-purge, post-purge, and sampling water quality readings will be collected. The parameters to be monitored and recorded will include dissolved oxygen, turbidity, pH, specific conductance, redox potential, and temperature.

Well purging can be performed with various equipment including: a dedicated bailer for hand bailing low volumes of water; a surface mounted electric centrifugal pump with dedicated polyethylene tubing; and/or submersible pump (when the depth to water is greater than 20 feet) with dedicated polyethylene tubing. During pumping, the intake will be placed directly below the static water surface and slowly lowered during the purging process. This procedure may not prove necessary in low-yielding wells but is important in high-yielding, permeable strata where

an intake initially placed deep in a well may draw laterally and have little influence in exchanging water from shallower depths within the well bore.

Flow rate during well purging will be approximated by the bucket and stop watch method. The duration of pumping required to remove three well volumes will be calculated directly from this flow rate. All fluids removed during purging will be treated on-site with activated carbon.

The sequence of obtaining site groundwater samples will be based upon available historical site data for existing wells and soil organic vapor analyzer (OVA) readings for newly installed wells. Site wells will be sampled in order from the lowest to highest concentration of water quality indicator parameters based upon the most recent available set of laboratory analyses to reduce the potential for sample cross-contamination. Groundwater samples will not be obtained for analysis from any well containing measurable free product.

The following sequence of procedures will be implemented for the collection of groundwater samples from monitoring wells.

1) Establish a clean work area where sampling equipment will not come in contact with the ground or any potentially contaminated surfaces.
2) Use a laboratory, pre-cleaned Teflon® sampling bailer for each well.
3) Use a clean pair of nitrile gloves.
4) Attach an appropriate length of unused, clean nylon or polypropylene cord to the designated sampling bailer.
5) Select appropriate laboratory-sterilized sample containers.
6) Slowly lower sampling bailer into well until water surface is encountered; continue to lower the sampling bailer into the standing water column to one foot below the water surface.
7) Retrieve bailer at a steady rate to avoid excess agitation.
8) Visually inspect bailed sample to ensure that no free product or organic detritus has been collected.
9) Uncap first designated sample vial and fill from bailer as rapidly as possible but minimizing agitation; secure septum and lid.
10) Inspect sealed sample for entrapped air; if air is present within sample vial. Remove lid and repeat vial filling, sealing and inspection process until no air is present.
11) Repeat Steps 9 and 10 for the second designated vial; all volatile parameter samples will be collected in duplicate.

12) Complete and attach labels to sample containers noting sample collector, date, time, and location of sample; record same data in field book.

13) Place samples in ice-filled cooler in such a manner as to avoid breakage. Samples collected for VOC analysis will be maintained at a temperature of 4°C.

Discard gloves and bailer cord and move to next sample location.

Methodology for Low-Flow Purging and Sampling:

For wells that will be Low-Flow purged and sampled, the USEPA Region III Bulletin QAD023: *Procedure for Low-Flow Purging and Sampling of Groundwater Monitoring Wells* will be followed. The following data will be reviewed for each well in order to set the pump intake for the low flow sampling:

- Soil boring (lithologic) log and continuous soil sample PID;
- Well construction log showing the screened interval;
- Identification of the most permeable zone screened by the well;
- Approximate depth to static water;
- Proposed pump intake setting; and
- Technical rationale for the pump intake setting, preferably across from the most impacted/contaminated subsurface interval.

Equipment

Adjustable rate, submersible, bladder pumps in conjunction with Teflon® or Teflon-lined polyethylene tubing for purging and sampling will be used. An alternate set up would include a stainless steel submersible Hurricane Pump with Teflon-lined tubing. The tubing diameter will be between 3/16-inch to ½-inch inner diameter and the length of the tubing extended outside the well will be minimized. Flow through cells will be used to evaluate parameters during sampling. Monitoring well information, equipment specifications, water level measurements, parameter readings, and other pertinent information will be recorded during monitoring well purging and sampling.

Sampling Procedure

The following protocol details the low-flow sampling procedure that will be used for sampling the monitoring wells.

1. PID Screening of Well. A PID measurement will be collected at the rim of the well

immediately after the well cap will be removed and recorded on the sampling form.

2. Depth to Water Measurement. A depth to water measurement will be collected and recorded. To avoid disturbing accumulated sediment and to prevent the inadvertent mixing of stagnant water, measuring the total depth of the well will be done at the completion of sampling on an annual basis.

3. Low Stress Purging Startup. Water pumping will commence at a rate of 100 to 400 milliliters per minute (mL/min). This pumping should cause very little drawdown in the well (less than 0.2-0.3 feet) and the water level should stabilize. Water level measurements are made continuously and will be recorded in milliliters per minute on the sampling form.

4. Low Stress Purging and Sampling. The water level and pumping rate will be monitored and recorded every five minutes during purging, and any pumping rate adjustments will be recorded. During the early phase of purging, emphasis will be placed on minimizing and stabilizing pumping stress, and recording any necessary adjustments. Adjustments, when necessary, will be made in the first 15 minutes of purging. If necessary, pumping rates will be reduced to the minimum capabilities of the pump to avoid well dewatering. If the minimal drawdown exceeds 0.3 feet, but the water level stabilizes above the pump intake setting, purging will continue until indicator field parameters stabilized, as detailed in Step 5 below. If the water level drops below the pump intake setting at the absolute minimum purge rate, the pump will remain in place and the water level will be allowed to recover repeatedly until there will be sufficient water volume in the well to permit the collection of samples.

5. Indicator Field Parameters Monitoring. During well purging, indicator field parameters (DO, turbidity, pH, specific conductance, and redox potential) will be monitored every five minutes (or less frequently, if appropriate). Purging will be considered complete and sampling began when all the aforementioned indicator field parameters had stabilized. Stabilization will be achieved when three consecutive readings, taken at five (5) minute intervals (or less frequently, if appropriate), are within the following limits:

   - DO (±10 percent);
   - turbidity (±10 percent);
   - specific conductance (±3 percent);
   - pH (± 0.1 unit); and
   - redox potential [Eh] ±10 mv).

   Temperature and depth to water will be also monitored during purging. Should any of the parameter-reading components of the flow-through meter fail during sampling; the sampling team will attempt to locate a replacement flow-through meter. If none is available, the

sampling team will measure that parameter with an individual criteria meter. Any other field observations relating to sample quality, such as odor, foaming, effervescence, and sheens, will also be recorded on the sampling form.

6. Collection of Ground Water Samples. Water samples for laboratory analyses will be collected before the groundwater had passed through the flow-through cell by either using a by-pass assembly or by temporarily disconnecting the flow-through cell. All sample containers will be filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. During purging and sampling, the tubing remains filled with water in order to minimize possible changes in water chemistry upon contact with the atmosphere. Methods employed to ensure that the outlet tubing will be filled include (i) adjusting the tubing angle upward to completely fill the tubing and (ii) restricting the diameter of the tubing near the outlet of the tubing.

The order in which samples will be collected is as follows:

- Volatile organics;
- Gas sensitive (e.g., Fe^{+2}, CH_4, H_2S/HS);
- Base/Neutrals or PAHs;
- Total Petroleum Hydrocarbons;
- Total metals;
- Dissolved metals;
- Cyanide;
- Sulfate and chloride;
- Nitrate and ammonia;
- Preserved inorganic;
- Non-preserved inorganic; and
- Bacteria.

Decontamination Requirements:

Numerous practices are employed throughout the processes of site investigation and sampling to assure the integrity of the resulting data. Of particular significance to the procedures of

groundwater measurement and sampling is the limitation, whenever possible, of materials inserted into a well bore and, even more importantly, of materials transferred from well to well.

Many items can be discarded between well sampling and/or gauging locations without significantly impacting project costs. Dedicated sampling equipment which can be discarded between well sampling locations without significantly impacting project costs, will be used whenever possible to preclude decontamination requirements. Sampling equipment included in this category are Teflon ® bailers, nitrile gloves, and bailer cord. However, other investigative and sampling equipment, including such items as liquid level probes, must be reused from well to well.

The danger in multi-well equipment applications lies in the potential of cross-contamination. While the threat of cross-contamination is always present, it can be minimized through the implementation of a consistent decontamination program during sensitive site measurement and data collection activities. The decontamination procedure is outlined below:

All site equipment used in a multi-well capacity will be decontaminated immediately prior to initial use and between each well. Standard site decontamination procedures for the optical interface probes between wells will be performed according to the following schedule:

- Initial rinse with clean tap water to remove excess residuals;
- Scrub equipment with sponge or clean, soft cloth in a distilled water/Liquinox@ (or equivalent) solution; and
- Double rinse with deionized/distilled water.

Rinse water generated during decontamination procedures will be treated on-site by passing the water through a bucket filled with activated carbon prior to disposal.

3. SOIL SAMPLING & WELL INSTALLATION

Responsible Personnel: Geologist

Training Qualifications: All field personnel supervising drilling activities shall have completed OSHA 40-Hour training, and three days of field training. Personnel supervising the well installation shall have observed drilling procedures for a minimum of three under the direct supervision of experienced personnel. Field personnel will have experience in operating the following field equipment: interface probe and photo-ionization detector (PID). Personnel should be able to describe soils encountered during drilling for generation of well logs.

Health and Safety Requirements:

A site specific HASP must be completed and reviewed by all field personnel. Prior to deploying a rig to the site, a utility call must be made (i.e. Pennsylvania One-Call) to allow mark-out of known subsurface utilities and associated laterals proximal to the site. Site plans, if available, should be reviewed to document and avoid the location of on-site utilities. No drilling should occur on retails sites within the exclusion zone. This zone is defined as the area between the pumps, the tank field and the station building. The area is excluded from drilling activities due to the likely occurrence of subsurface petroleum distribution lines. After review of all known mapped and marked utilities, a site reconnaissance will be performed to document the location of utility meters and storm sewer drains. In addition, the location of overhead utilities must be documented. After completing the subsurface and overhead utility review, the area to drill may be observed as clear or the location may be adjusted to a “clear” location.

Once the drilling location is established, the area must be marked with cones to alert area traffic of the work area. Other health and safety concerns include slip/trip hazards, working with heavy equipment and overhead work hazards. During drilling activities, a minimum of protective work gloves, steel toed boots, hard hats, and safety goggles must be worn.

A final health and safety requirement includes hand clearing the borehole, prior to advancing the borehole with the drill rig. To ensure the safety of workers, the borehole will be cleared by hand or air knife, to depth of 5 feet below ground surface. This will serve to clear the area of utilities, prior to drilling.

Decontamination Requirements:

All down-hole equipment must be steam cleaned prior to drilling at each boring/well location. All soil sampling equipment must be cleaned with detergent and rinsed with distilled water prior to deployment into the borehole. All well construction materials (i.e. PVC well casing, PVC well screen, sand pack, bentonite seal) should be clean and dedicated to each hole.

Methodology for Borings Outside RCRA Areas in AOI 5:

1) Borehole Advancement

During soil sampling or well installation activities, a borehole is advanced into the unconsolidated subsurface materials or bedrock via a drill rig (or similar). Various types of drilling methods could be deployed to advance the hole. A description of each drilling method is included below:

a) Hollow Stem Auger

A spiral tool form is used to move material from the subsurface to the surface. A bit at the bottom cuts into the subsurface material. Spiral augers on outside convey the material to the surface while spinning. The center of the auger is hollow like a straw when the inner drive rods and plug are removed. During drilling or formation cutting, the center is filled with rods connected to a plug at the bottom bit. Once the desired drilling depth is reached, the center plug and rods can be pulled out, leaving the hollow augers in place. The hollow augers hold the borehole to remain open for sediment sampling and well installation.

b) Air Rotary

A drill bit at the bottom of rods is used to cut into the subsurface material. Air injected into the drill rods escapes through small holes in the drill bit and conveys the drill cuttings to the surface.

c) Geoprobe®

The geoprobe® sampling allows collection of soil by directly pushing (through hydraulic hammering) a sampling device lined with a plastic macrocore into the soil column.

d) Hand Auger

A stainless steel or aluminum hand auger will be physically advanced to the desired soil sampling depth.

2) Soil Sampling

Soil samples will be obtained for lithologic logging and laboratory analysis for chemical contaminants with one of three different sampling devices: Split barrel spoon sampler, hand auger or Geoprobe® soil sampler. For either method, the sampling devices are lowered through the hollow-stem augers or open borehole to allow sampling of the undisturbed sediments below the auger bit. Soil samples will be collected at intervals which appear to be visually impacted or from intervals which exhibit the highest deflections on the screening device (PID or similar).

a) Split barrel spoon sampler (split spoon)

The split spoon sampler will be driven into the soil column in accordance with ASTM Standard Method D1586 (Reference A6, Appendix E). Soil sampling by split barrel spoon will entail drilling a borehole with a hollow-stem auger to the desired sampling depth (standard five foot intervals). After augering to the desired depth, slowly and carefully lower the split barrel spoon sampler attached to the drill rod extension into the borehole. Drive the sampler into the soil by repeated blows from a 140 Lb. hammer with 30 inch travel. Record the blow counts required to drive the split spoon sampler each successive six inch interval.

Remove sampler for borehole, split barrel open, remove soil sample utilizing a stainless steel knife to trim the top and edges of the sample and containerize sample in appropriate sample jar.

b) Geoprobe®

The geoprobe® liner is dedicated to each soil sampling interval. After retrieval of the sample, the liner may be sliced open and the soil sample can be logged and containerized in the appropriate sample jar. During shallow soil sampling from fine-grained sediments, the geoprobe® can advance the sampler directly into the ground, without the advance of an augered borehole.

c) Hand Auger

The hand auger allows for soil from the desired interval to be collected directly by removing the soil column that is contained in the auger portion of the device.

Methodology for Well Installations:

1) Well Construction

After drilling to the desired depth or the desired interval, permanent monitoring wells can be installed to allow groundwater sampling. In general, wells are constructed with slotted screen, which allows groundwater to flow into the well at the desired monitored interval and well casing, which restricts groundwater flow into the well from undesired interval. In most cases the well materials are constructed of PVC. In conditions where the shallowest groundwater interval is monitored, a single case construction monitoring well is installed. In conditions where multiple water bearing units occur and deep groundwater conditions are selected for monitoring, a double cased well is installed.

a) Single Casing Construction

The construction details of a monitoring well are determined by soil type, depth to groundwater and relative fluctuation of groundwater level. After drilling to the desired depth, a monitoring well is constructed for installation into the evacuated borehole. The well consists of a bottom cap, a length of screen and length of well casing. To determine the length of screen used, seasonal groundwater table or tidal fluctuations should be considered to allow the water table to intercept the well screen throughout the year. The assembled well is then inserted into the borehole.

The annular space between the well screen and subsurface is filled with a sand pack, which consists of clean, sorted sand. The sand pack allows water flow into the well but acts as a

filter to prevent subsurface sediments from silting in the well. The sand pack extends one to two feet above the top of well screen. Above the sand pack, a seal is installed in the annular space between the well casing and the subsurface. The seal is comprised of hydrated bentonite and prevents surface water from infiltrating the well screen. Above the well seal, the annular space is backfilled with drill cuttings or cement. A cap is placed on the top of the well to further prevent infiltration of the surface water. The top of the well is protected with either a stand-up pipe or a locking, flush mount box.

b) Double Casing Construction

In cases where multiple water bearing zones occur, a double case well is installed to allow monitoring of the deeper water bearing zones. Construction of a double cased well is similar to that of a single case well; however, to prevent groundwater infiltration from shallower water bearing zones, a second casing is installed. This type of construction requires drilling two different diameter boreholes.

During drilling through the shallower groundwater zones, large diameter augers/bits are used to create a large diameter borehole. The borehole is advanced through the shallower water bearing area which will not be monitored. An outer casing is installed to seal the deeper monitoring well from infiltration from the shallow water bearing zones. After the outer casing is installed, the borehole is advanced deeper with smaller diameter auger/bit. The outside diameter of second augers fit within the inside diameter of the outer casing. The borehole is advanced to allow monitoring of the deeper water bearing zone. Once the desired depth is obtained, a monitoring well is installed within the outer casing, using similar methods as described in the single casing construction (3a, above). The outside casing prevents shallow groundwater infiltration into the well. The inside casing prevents surface water infiltration into the well.

2) Soil Cutting Handling

Cuttings generated from drilling will be containerized or stock-piled, undercover, until appropriate disposal is determined. In the case the soils are not impacted, the cuttings may remain on-site. Impacted soils will be removed using appropriate hazardous waste handling procedures and disposed of with an approved hazardous waste handler.

3) Well Development

After installation, monitoring wells are developed to remove residual sediments within the well and annular space. Water is pumped from the well a low flow rate (to minimize turbulence within the well and associated sand pack) until groundwater flowing from the well appears relatively free of sediments.

Documentation:

All site activities should be detailed in the site investigators fieldbook. The entry shall include the date, time, weather, address, and persons present on-site. In addition, data required to create well construction logs or boring logs (if no well is constructed) should be collected. This data includes soil type, relative moisture content, depth of water table, observed impact, soil screening measurements (if PID is used), blow counts (if split spoon samples are collected), sample recovery, depth of borehole, length of well screen, length of well casing(s), sand pack interval, well seal interval. The site investigator should identify the relative location and number.

4. NON-AQUEOUS PHASE LIQUID (NAPL) SAMPLING PROCEDURES

Responsible Personnel: Technicians and Geologists

Training Qualifications:

All field personnel involved must have completed OSHA 40 HOUR HAZWOPER training. Prior to NAPL sampling, all field personnel will have worked a minimum of three sites under the direct supervision of experienced personnel. Field personnel will also have experience in sampling and vapor monitoring techniques and sampling equipment decontamination.

Materials and Equipment Necessary for Task Completion:

A list of equipment required to sample NAPL from a monitoring well is presented below:

- Current site map detailing well locations;
- Field data book for recording site data;
- Liquid level gauging device (graduated, optical interface probe);
- Keys and tools to provide well access;
- Appropriate sample containers and labels. NAPL samples will be collected in laboratory provided 40 milliliter (ml) glass vials with plastic caps fitted with Teflon ® lined septa; all sample bottles will be laboratory sterilized and will contain the appropriate preservative, if applicable. A minimum of 10 ml is required for laboratory analysis. In the case that sufficient volume is not obtained, a swabbing technique (described below) will be used;
- Sorbent pads (required for swabbing technique);
- Teflon ® (or equivalent) bottom-loading bailer to obtain NAPL sample;
- Clean nylon or polypropylene bailer cord;

- Decontamination supplies;
- H&S supplies (tyvek, nitrile gloves, safety goggles);
- Blank chain-of-custody forms; and
- Cooler and ice for sample preservation.

Health and Safety Requirements:

Site specific HASP must be completed and reviewed by field personnel. As a minimum, modified Level "D" attire will be worn. Individuals performing NAPL sampling are required to wear safety goggles, tyvek suit, and nitrile sampling gloves.

Decontamination Requirements:

During NAPL sampling activities, dedicated sampling equipment (i.e. Teflon ® bailers, nitrile gloves, and bailer cord) are utilized; thereby, eliminating decontamination requirements. The interface probe, used to record the presence of NAPL and relative thickness prior to sampling, does require decontamination between sampling locations.
All site equipment used in a multi-well capacity will be decontaminated immediately prior to initial use and between each well. Standard site decontamination procedures for the optical interface probes between wells will be performed according to the following schedule:

- Initial rinse with clean tap water to remove excess residuals;
- Scrub equipment with sponge or clean, soft cloth in a distilled water/Liquinox® (or equivalent) solution; and
- Double rinse with deionized/distilled water.

Methodology:

Each monitoring well to be sampled will be gauged to obtain liquid level and relative NAPL thickness immediately prior to initiation of the sampling process. Refer to SOP No. 1 for appropriate well gauging procedures. Liquid level data will be recorded in a field book.

Sampling of the NAPL will occur via two different methods: direct sample or swabbing.

The following sequence of procedures will be implemented for the collection of groundwater samples from monitoring wells.

1) Establish a clean work area where sampling equipment will not come in contact with the ground or any potentially contaminated surfaces.

2) Use a laboratory, pre-cleaned Teflon® sampling bailer for each well.
3) Don an unused, clean pair of nitrile gloves.
4) Attach an appropriate length of unused, clean nylon or polypropylene cord to the designated sampling bailer.
5) Select appropriate laboratory-sterilized sample containers.
6) Slowly lower sampling bailer into well until water surface is encountered; continue to lower the sampling bailer into the standing water column to one foot below the water surface.
7) Retrieve bailer at a steady rate to avoid excess agitation.
8) Visually inspect bailed sample to ensure for relative thickness of NAPL. If sufficient volume is present (>10 ml) place a direct sample of the NAPL into the laboratory vial. If less than 10 ml of NAPL is present, use a sorbent pad to absorb the NAPL from the surface of the groundwater sample. Place is swab sample into the laboratory vial.
9) Complete and attach labels to sample containers noting sample collector and date, time, and location of sample; record same data in field book.
10) Place samples in ice-filled cooler in such a manner as to avoid breakage. Samples collected for VOC analysis will be maintained at a temperature of 4°C.
11) Discard gloves and bailer cord and move to next sample location.

Documentation:

All site activities should be detailed in the site investigators fieldbook. The entry shall include the date, time, weather, address, persons present on-site, and the aforementioned parameters. Only relevant observations should be recorded. The nature of the work being performed is also appropriate.

1.1 Field Procedures for Surface Water Sampling

1.1.1 General

Surface water sampling is performed to obtain samples for surface water bodies that are representative of existing surface water conditions.

Surface water sampling locations for surface water quality and groundwater interaction studies are selected based on the following:

1. Study objectives
2. Location of point surface discharges
3. Non-point source discharges and tributaries
4. Presence of structures (e.g., bridge, dam)
5. Accessibility

During surface water sampling it is important to obtain samples that are not impacted by the re-suspension of sediment produced because of improper or poor surface water sampling techniques.

1.1.2 Surface Water Sample Location Selection

Prior to conducting surface water sampling activities, the first requirement is the consideration and development of surface water sampling locations. It is important that all surface water sampling locations be selected in accordance with the Work Plan.

Wading for surface water samples increases the chances of disturbance of sediments from the floor of the surface water body.When wading for surface water samples be aware of potential safety and health risks. A life vest and safety line must be worn at all times where footing is unstable or when sampling in fast moving or more than 3 feet (0.9 m) deep. A two-person team is required for most surface water sampling activities. If the site conditions require the use of the life vest and safety line, the two people involved in the sampling must be competent swimmers.

Surface water samples must be collected with no suspended sediments. Surface water samples are collected commencing with the furthest downstream location to avoid sediment interference with upstream locations.

1.1.2.1 Rivers, Streams, and Creeks

Surface water samples are generally collected in areas of surface water bodies that are representative of the surface water body conditions. Representative surface water samples will usually be collected in sections of surface water bodies that have a uniform cross section and flow rate. Mixing is influenced by turbulence and water velocity, therefore the selection of surface water sampling locations immediately downstream of a riffle area (i.e., fast flow zone) will ensure good vertical mixing. These locations are also likely areas for deposition of sediment since this occurs in areas of decreased flow velocity.

Surface water sampling locations should not be established in areas near point source discharges. Surface water sampling of these source discharge points can be performed to assess the impact of

these source areas on overall surface water quality.Sample tributaries as close to the mouth as possible. It is important to select surface water sample locations considering the impact downstream, including tributary flow and sediment.

In all instances, properly document all surface water sampling locations. Documentation may include photographs and tie-ins to known structures.

1.1.3 Sampling Equipment and Techniques

When collecting surface water samples, direct dipping of the sample container into the stream or water is acceptable unless the sample container contains preservatives. If preserved, a pre-cleaned unpreserved sample container should be used to collect the surface water sample. The surface water sample is then transferred to the appropriate preserved sample container. When collecting surface water samples, submerse the inverted bottle to the desired sample depth and tilt the opening of the sample container upstream to fill. During surface water sample collection, wading or movement may cause sediment deposits to be re-suspended and can result in biased samples. Wading is acceptable if the stream has a noticeable current and the samples are collected directly in the sample container when faced upstream. If the stream is too deep to wade in or if addition samples must be collected at various depths, additional sampling equipment will be required. Surface water samples should be collected about 6 inches (15 cm) below the surface, with the sample bottles being completely submerged. Taking the surface water sample at this depth eliminates the collection of floating debris in the sample container.

Surface water sample collection where the flow depth is less than 1 inch (<2.5 cm) requires the use of special equipment to eliminate sediment disturbance. Surface water sampling may be conducted with a container then transferred to the appropriate sample container, or collection may be performed using a peristaltic pump. A small excavation in the stream bed to create a sump for sample collection can also be considered but should be prepared in advance to allow all the sediment to settle prior to surface water sampling activities.

Teflon™ bailers can be used for surface water sampling if it is not necessary to collect surface water samples at specific depths. A bottom loading bailer with a check ball is sufficient. When the bailer is lowered through the water, the water is continually displaced through the bailer until the desired depth is reached. The bailer is retrieved and the check ball prohibits the release of the collected surface water sample. Bailers are not suitable in surface water bodies with strong currents, or where depth-specific sampling is required.

For discrete and specified depth surface water sampling, and the parameters to be monitored do not require a Teflon™ coated sampling device, a standard Kemmerer or Van Dorn sampler can be used. The Kemmerer sampler is a brass cylinder with rubber stoppers that leave the sampler ends open while the sampler is being lowered. The sampler is lowered in a vertical position to allow water to pass through. The Van Dorn sampler is plastic and is lowered in a horizontal position. For both samplers, a messenger is sent down a rope when the sampler has reached the required depth. The messenger causes the stopper on the sampler to close. The sampler is then retrieved and the surface water sample can be collected through a valve. DO sample bottles can be filled by allowing overflow using a rubber tube attached to the valve. During depth-specific surface water sampling, take care not to disturb bottom sediments.

Glass beakers or stainless steel cups may also be used to collect surface water samples if parameter interference does not occur. The beaker or cup must be rinsed at least three times with the surface water sample prior to sample collection.

All equipment must be thoroughly decontaminated.

1.1.4 Field Notes for Surface Water Sampling

Record daily surface sampling activities, describe surface water sampling locations, sampling techniques, and, if applicable, provide a description of photographs taken. Visual observations are important and provide valuable information when interpreting surface water quality results. Observations include:

1. Weather conditions
2. Stream flow directions
3. Stream physical conditions (width, depth, etc.)
4. Tributaries
5. Effluent discharges
6. Impoundments
7. Bridges
8. Railway trestles
9. Oil sheens
10. Odors
11. Buried debris
12. Vegetation
13. Algae
14. Fish and other aquatic life
15. Surrounding industrial areas

The following factors should be considered for surface water sampling:

1. Predominant Surrounding Land Use: Observe the prevalent land use type in the vicinity and note any other land uses in the area which, although not dominant, may potentially affect surface water quality.
2. Local Watershed Erosion: Note the existing or potential erosion of soil in the local watershed and its movement into the stream. Erosion can be rated through visual observation of watershed stream characteristics including increases or decreases in turbidity.
3. Local Watershed Non-Point Source Pollution: This refers to problems or potential problems other than erosion and sedimentation. Nonpoint source pollution can be diffuse agricultural and urban runoff. Other factors may include feed lots, wetlands, septic systems, dams, impoundments, and mine seepage.
4. Estimated Stream Width: The estimated distance from shore at a transect representative of the stream width in the area.

5. Estimated Stream Depth: Riffle (rocky area), run (steady flow area), and pool (still area). Estimate the vertical distance from the water surface to the bottom of the surface water body at a representative depth at three locations.
6. High Water Mark: Estimate the vertical distance from the bank of the surface water body to the peak overflow level, as indicated by debris hanging in bank or flood plain vegetation, and deposition of silt. In instances where bank flow is rare, high water marks may not be evident.
7. Velocity: Record or measure the stream velocity in a representative run area.
8. Dam Present: Indicate the presence or absence of a dam upstream or downstream of the surface water sampling location. If a dam is present, include specific information detailing the alteration of the surface water flow.
9. Channelized: Indicate if the area surrounding the surface water sampling location is channelized.
10. Canopy Cover: Note the general proportion of open to shaded areas which best describes the amount of cover at the surface water sampling location.

1.2 References

For additional information pertaining to surface water sampling, the user of this manual may reference the following:

ASTM D5358	Practice for Sampling with a Dipper or Pond Sampler
ASTM D4489	Practices for Sampling of Waterborne Oils
ASTM D3325	Practice for the Preservation of Waterborne Oil Samples
ASTM D4841	Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents
ASTM D4411	Guide for Sampling Fluvial Sediment in Motion
ASTM D4823	Guide for Core-Sampling Submerged, Unconsolidated Sediments
ASTM D3213	Practice for Handling, Storing, and Preparing Soft Undisturbed Marine Soil
ASTM D3976	Practice for Preparation of Sediment Samples for Chemical Analysis
ASTM E1391	Guide for Collection, Storage, Characterization, and Manipulation of Sediments for Toxicological Testing
ASTM D4581	Guide for Measurement of Morphologic Characteristics of Surface Water Bodies
ASTM D5906	Guide for Measuring Horizontal Positioning During Measurements of Surface Water Depths
ASTM D5073	Practice for Depth Measurement of surface water

Sediment Sampling Standard Operating Procedures

Introduction

Sediment sampling is conducted to obtain samples that are representative of existing chemical and/or physical conditions of sediment.

Equipment Decontamination

On environmental sites, sediment sampling equipment (e.g., split spoons, trowel, spoons, shovels, bowls, dredges, corers, scoops) are typically cleaned as follows:

1. Wash with clean potable water and laboratory detergent, using a brush as necessary to remove particulates.
2. Rinse with tap water.
3. Rinse with deionized water.
4. Air dry for as long as possible.

Additional or different decontamination procedures may be necessary if sampling for some parameters, including volatile organic compounds (VOCs) and metals.

Sample Site Selection

Before any sampling is conducted, the first requirement is to consider suitable sampling locations. Sampling locations should be selected in accordance with the Work Plan. Wading for sediment samples in lagoons, lakes, ponds, and slow-moving rivers and streams must be done with caution since bottom deposits are easily disturbed. Sampling must only be attempted where safe conditions exist and samples must be collected from undisturbed sediments. All sediment samples are to be collected commencing with the most downstream sample to avoid sediment interference with other downstream samples. A life vest and safety line should be worn in all cases where footing is unstable or where water is fast moving or over 3 feet (0.85 m) in depth. A second person may also be required for most of the sampling scenarios.

Rivers, Streams, and Creeks

Sediment samples may be collected along a cross-section of a river or stream in order to adequately characterize the bed material, or from specific sediment deposits as described in the Work Plan. A common procedure is to sample at quarter points along the cross-section of the sampling site selected. Samples may be composited as described in the Work Plan. Samples of dissimilar composition (e.g., grain size, organic content) should not be combined.

Representative samples can usually be collected in portions of the surface water body that have a uniform cross-section and flow rate. Since mixing is influenced by turbulence and water velocity, the selection of a site immediately downstream of a riffle area (e.g., fast flow zone) are likely areas for deposition of sediment since the greatest deposition occurs where stream velocity slows.

A site that is clear of immediate point sources (e.g., tributaries and industrial and municipal effluents) is preferred for the collection of sediment samples unless the sampling is being performed to assess these sources.

Sampling Equipment and Techniques

General

Any equipment or sampling technique(s) [e.g., stainless steel, polyvinyl chloride (PVC)] used to collect a sample is acceptable so long as it provides a sample which is representative of the area being sampled and is consistent with the Work Plan.

Sediment Sampling Equipment and Techniques

A variety of methods may be used to collect sediment samples from a stream, river, or lake bed. Dredging (Peterson, Ponar, Van Veen), coring and scooping are acceptable sediment sample collection techniques. Precautions shall be taken to ensure that a representative sample of the targeted sediment is collected. Caution should be exercised when wading in shallow water so as not to disturb the area to be sampled. Samplers should be selected based on the interval to be sampled, type of sediment/sludge (silt, sand, gravel), and required sample volume. More than one sampler is often required to implement a sampling program at a site. The following describes some of these methods. Manufacturers information should be consulted to determine the limitations of each type of sampling equipment.

Dredging

The **Peterson dredge** is best used for rocky bottoms, in very deep water, or when the stream velocity is rapid. The dredge should be lowered slowly as it approaches the bottom, so as to not disturb the lighter sediments.

The **Ponar dredge** is similar to the Peterson dredge in size and weight. The Ponar dredge is a "clam-shell" type unit that closes on contact with the river/lake bottom. Depending on the size of the unit, a winch is required for larger units, whereas smaller units are available for lowering by a hand line. Once retrieved, the unit is opened and the sample extracted using a sample scoop or spoon. The unit has been modified by the addition of side plates and a screen on top of the sample compartment. This permits water to pass through the sampler as it descends.

The **Ponar grab** sampler functions by the use of a spring-latch-messenger arrangement. The sampler is lowered to the bottom of the water body by means of a rope, then the messenger is sent down to trip the latch causing the sampler to close on the sediments. The sampler is then raised slowly to minimize the disturbance of the lighter sediments. Sediment is then placed into a stainless steel bowl, homogenized, and placed into the appropriate sample container (if collecting for VOC parameters, fill the VOC jars before homogenization).

Corers

Core samplers are used to obtain vertical columns of sediment. Many types of coring devices are available, depending on the depth of water from which the sample is to be collected, the type of bottom material, and the length of core to be obtained. They vary from hand-push tubes to weight or gravity-driven devices to vibrating penetration devices.

Coring devices are useful in contaminant monitoring due to the minimal disturbance created during descent. The sample is withdrawn intact, allowing the removal of only those layers of interest. Core liners consisting of plastic or Teflon may also be added, thereby reducing the potential for sample contamination and maintaining a stratified sample. The samples may be shipped to the lab in the tubes in which they were collected. The disadvantage of coring devices is that only a small sampling surface area and sample size is obtained, often necessitating repetitive sampling in order to collect the required amount of sediment for analysis. It is also often difficult to extract the sediment sample back out through the water column without losing the sample.

The core tube is pushed/driven into the sediment until only 4 inches (10 cm) or less of tube is above the sediment-water interface. When sampling hard or coarse sediments, a slight rotation of the tube while it is pushed will create greater penetration and reduce compaction. Cap the tube with a Teflon plug or a sheet of Teflon. The tube is then slowly withdrawn, keeping the sample in the tube. Before pulling the bottom part of the core above the water surface, it must be capped.

Scooping

The easiest way to collect a sediment sample is to scoop the sediment using a stainless steel spoon or scoop. This may be done by wading into the stream or pond and, while facing upstream (into the current), scooping the sample from along the bottom in an upstream direction. This method is only practical in very shallow water.

Mixing

Sediment samples collected for chemical analysis should be thoroughly mixed (except for VOCs) in a stainless steel bowl prior to placement in the appropriate sample container. Standard procedures exist for preparation of sediment samples (ASTM D3976). These should be followed or the laboratory informed of applicable procedures.

Air Monitoring

Prior to sediment/sludge sampling, measure the breathing space above the sample location with a photoionization detector (PID), should the potential for volatiles be present, and use a hydrogen sulfide meter should hydrogen sulfide be present. Repeat these measurements during sampling. If either of these measurements exceed any of the air quality criteria established in the HASP, air purifying respirators (APRs) or supplied air systems will be required.

Sample Location Tie-In/Surveying

The recording of the sample locations and depth on the site plan is extremely important. This may be accomplished by manual measurement (i.e., swing ties), global positioning system (GPS) survey, or stadia methods. Manual measurements for each sample location should be tied into three permanent features (e.g., buildings, utility poles, hydrants). Diagrams with measurements should be included in the field book.

Field Notes

A bound field book is used to record daily activities, describe sampling locations and techniques, and describe photographs (if taken). Visual observations are important, as they may prove invaluable in interpreting water or sediment quality results. Observations shall include (as applicable) weather, stream flow conditions, stream physical conditions (width, depth, etc.),

tributaries, effluent discharges, impoundments, bridges, railroad trestles, oil sheens, odors, buried debris, vegetation, algae, fish or other aquatic life, and surrounding industrial areas. The following observations should be considered:

- **Predominant Surrounding Land Use**: Observe the prevalent land use type in the vicinity (noting any other land uses in the area which, although not predominant, may potentially affect water quality).
- **Local Watershed Erosion**: The existing or potential erosion of soil within the local watershed (the portion of the watershed that drains directly into the stream) and its movement into a stream is noted. Erosion can be rated through visual observation of watershed and stream characteristics. (Note any turbidity observed during water quality assessment.)
- **Local Watershed Non-point Source Pollution**: This item refers to problems and potential problems other than siltation. Non-point source pollution is defined as diffuse agricultural and urban runoff (e.g., stormwater runoff). Other compromising factors in a watershed that may affect water quality are feedlots, wetlands, septic systems, dams and impoundments, and/or mine seepage.
- **Estimated Stream Width**: Estimate the distance from shore at a transect representative of the stream width in the area.
- **Estimated Stream Depth**: Riffle (rocky area), run (steady flow area), and pool (still area). Estimate the vertical distance from water surface to stream bottom at a representative depth at each of the three locations.
- **High Water Mark**: Estimate the vertical distance from the stream bank to the peak overflow level, as indicated by debris hanging in bank or floodplain vegetation, and deposition of silt or soil. In instances where bank overflow is rare, a high water mark may not be evident.
- **Velocity**: Record an estimate of stream velocity in a representative run area (see Section 12.0).
- **Dam Present**: Indicate the presence or absence of a dam upstream or downstream of the sampling station. If a dam is present, include specific information relating to alteration of flow.
- **Channelized**: Indicate whether the area around the sampling station is channelized.
- **Canopy Cover**: Note the general proportion of open to shaded area which best describes the amount of cover at the sampling station.
- **Sediment Odors**: Disturb sediment and note any odors described (or include any other odors not listed) which are associated with sediment in the area of the sampling station.
- **Sediment Oils**: Note the term which best describes the relative amount of any sediment oils observed in the sampling area.
- **Sediment Characteristics:** Note the grain size, color, consistency, layering, presence of biological organisms, man-made debris, etc. in accordance with standard ASTM soil description protocols.
- **Sediment Deposits**: Note those deposits described (or include any other deposits not listed) which are present in the sampling area. Also indicate whether the undersides of rocks not deeply embedded are black (which generally indicates low dissolved oxygen or anaerobic conditions).

References

For additional information pertaining to this topic, the user of this manual may reference the following:

ASTM D5358	Practice for Sampling with a Dipper or Pond Sampler
ASTM D4489	Practices for Sampling of Waterborne Oils
ASTM D3325	Practice for the Preservation of Waterborne Oil Samples
ASTM D4841	Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents
ASTM D4416	Guide for Sampling Fluvial Sediment in Motion
ASTM D4823	Guide for Core-Sampling Submerged, Unconsolidated Sediments
ASTM D3213	Practice for Handling, Storing, and Preparing Soft Undisturbed Marine Soil
ASTM D3976	Practice for Preparation of Sediment Samples for Chemical Analysis
ASTM E1391	Guide for Collection, Storage, Characterization, and Manipulation of Sediments for Toxicological Testing
ASTM D4581	Guide for Measurement of Morphologic Characteristics of Surface Water Bodies
ASTM D5906	Guide for Measuring Horizontal Positioning During Measurements of Surface Water Depths
ASTM D5073	Practice for Depth Measurement of Surface Water
ASTM D5413	Test Methods for Measurement of Water Levels in Open-Water Bodies

Appendix C
Soil Boring and Monitoring Well Logs

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-001**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/12/2016 13:54:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/12/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown silty sand, coarse to fine, gravel, dry									0	
	0.25		0.5	Dark brown sand, some silt, coarse to fine, gravel fill, moist									0.1	
	0.5		1	Gray black to black, sandy silt, some gravel, moist, slight odor, some brick pieces									0.5	
	1		1.5	Gray black to black, silty sand, fine to coarse, some gravel, some brick pieces									0.6	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-002**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/12/2016 9:31**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/12/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown to dark brown sandy silt, gravel, cobbles									1.3	
	0.25		0.5	Brown to tan sandy silt, pebbles, cobbles									0.6	
	0.5		1	Brown sandy silt, organics, brick pieces, gravel, cobbles									0.9	
	1		1.5	Dark brown silty sand, fine to coarse, pebbles, cobbles									0.3	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-003**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/12/2016 11:43**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/12/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Dark brown silty sand, fine to coarse, abundant brick. Refusal at 0.5'. Move over three feet, refusal again. Sampled here									0.2	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-004**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/21/2016 16:10:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/21/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Medium brown sand, fine to coarse, gravel, pebbles, some silt, dry, some moist									0	
	0.25		0.75	Medium brown silty sand, some cobbles, fine, some coarse, glassm coal pieces									0.7	
	0.75		1.75	Medium brown silty sand, fine to coarse, brick pieces, glass, cobbles, moist									0.7	
	1.75		2.17	Brown sand, some silt, brick pieces, some cobbles, moist									0.1	
		2.3		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-005**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/12/2016 0:00**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/12/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Gray brown, gravel, some sand, no odor									0.2	
	0.25		0.5	Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-006**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/22/2016 9:35**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/22/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.42	Concrete									0	
	0.42		1	Brown silty sand, gravel, brick pieces, moist, compacted									1.2	
	1		1.5	Dark brown sandy silt, wood pieces, some gravel, brick pieces, mica									8.8	
	1.5		2.25	Darb brown to brown black sandy silt, fine, some cobbles, wood fragments, mica									1.2	
		2.3		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-007**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/8/2016 14:00:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/8/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown silty sand, dry, gravel with pebbles									1.2	
	0.25		0.5	SAA									2	
	0.5		1	Brown, silty sand gravel, some pebbles, moist										
	1		1.5	Brown gravelly sand, some silt, moist									1.7	
	1.5		2	Gray brown gravelly sand, pebbles, very moist fill. Brick with silt									1.1	
	2		2.25	Silty sand, gravel, brick, green to gray, wet, slight odor. Refusal at 2.25									0.9	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-008**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/8/2016 15:00:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/8/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Gravel, sand, brown, dry with silt.									1.1	
	0.25		0.5	Brown gray, gravelly, sand silty, dry									0	
	0.5		1	Brown to dark brown, silty sand, gravel, brick pieces, wood, moist									0.4	
	1		1.5	Brown, gravelly sand, silt, moist, some brick fragments									3.7	
	1.5		1.75	Light brown gray, gravelly sand, some pebbles, silt, brick pieces, moist, slight odor									0.2	
	1.75		2	Brown, silty sand, gravel, brick fragments, moist									0.4	
	2		2.5	Brown, silty sand, gravel, brick fragments, moist, some tan clay									1.8	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-009**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/8/2016 16:00:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/8/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown, silty sand, gravel, dry, some tan clay									0.3	
	0.25		0.5	Brown tan sandy silt, cobbles, gravel, some brick pieces									0.4	
	0.5		1	Brown to dark gray, sandy silt, gravel, some organics, glass pieces										
	1		1.5	Light brown, gray, silty sand, gravel, cobbles, wood fragments, brick piece, moist									0	
	1.5		1.75	Brown, silty sand, cobbles, gravel, organics, wood fragments, brick pieces									4.3	
	1.75			Refusal after 1.75, could not get a deep sample										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-010**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 13:40:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Moist to wet, brown sand, gravel, no odor									0	
	0.5		11"	Brown, sand, gravel. Groundwater at 11"										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-011**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 13:53:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown to dark brown silty sand, gravel, some tan clay, glass									0.7	
	0.5		10"	Gray black to brown, silty sand, gravel, some clay, stained, slight odor. Water at 10"									25	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-012**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 14:42:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown silty sand, coarse gravel, moist									0	
	0.25		0.6	Brown to dark brown silty sand, coarse, gravel, some green gray clay, moist, slight odor									2.4	
	0.6		1	Dark brown, coarse sand, gravel, moist, odor, green gray clay. Refusal at 1.1', move 2 feet from first hole									0.4	
	0.5		1	In new hole: dark gray to gray black gravel sand, coarse, wet, slight odor. Water at 1.7'										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-013**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 15:45:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION: Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown coarse sand gravel, wet, some silt									3.1	
	0.25		0.5	Brown to black silty sand, coarse to fine gravel, slight odor, staining, moist									67.6	
	0.5		1	Gray black, silty sand, some gravels, fine to coarse moist, staining									90.4	
	1		2	Gray black to brown, silt sand, fine to coarse, gravel, wet, slight odor, some green gray clay. Water at 2'									48.9	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-014**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/5/2016 16:20:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/5/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Dark brown, moist, sandy silt, some gravel									0	
	0.5		1	Dark brown to black, silty, some sand, occasional gravel, slight odor, stain, moist to wet									0.9	
	1		1.5											
	1.5		2	Dark brown silt, some sand, black staining, some pebbles, odor									51.1	
	2		2.5	Same, wet									363	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-015**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/5/2016 14:45:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/5/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown silt loam, some sand, few pebbles, trace organics, moist, no odor									0	
	0.5		1	Light brown clayey silt, some sand, occasional red rust, moist									0	
	1		1.5	Black stain, strong odor. Dark brown to black, silty, some sands/clay with pebbles, moist									10.9	
	1.5		2	Black stain, some tan silty clay, some gravel, trace sand, strong odor, trace organic matter									130	
	2		2.1	Same as above. Hit refusal at 2.1'									21	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-016**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/4/2016 16:30**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/4/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		7"	Brown, silty with some clay, gravel, some pebbles									11.8	
	7"		1'	Same as above									27	
	1'		1.5'	Soil same, strong petro odor and staining									1024	
	1.5'		2'	Silty, some clay, gravel, strong odor, staining. Dark gray.									936	
	2'		2.5'	silty, some sands and gravels, strong odor, dark gray, staining									7655	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-017**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 11:43**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Light brown to dark brown, moist, sand, gravel, pebbles									0	
	0.5		1	Dark brown, sand, gravel									0	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-018**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 11:00**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Light brown sandy silt to silty sand, gravel.									0	
	0.5		1	Brown to dark brown silty sand, gravel									0.2	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-019**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/21/2016 15:30:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/21/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.83	Yellow brown silt loam, mixed with 75% rocks (2-3 inches in size), dry to moist										
	0.83		1.83	Medium brown silt, some cobbles, yellow brown gravel, some glass, some brick pieces									0.3	
	1.83		3	Medium brown silty sand, pebbles, some gravel, some glass, moist to wet									0.3	
		3		Groundwater table										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-020**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/21/2016 14:30:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/21/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		1.08	Brown grading to gray brown gravel, large rocks, brick, some silty sand, some wood fragments, dry									68.7	
	1.08		1.42	Concrete asphalt									0	
		1.4		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-021**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/21/2016 13:21:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/21/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown grading to gray brown gravel, large rocks, brick, some silty sand, some wood fragments, dry									2	
	0.5		0.83	Concrete asphalt									23.6	
		0.9		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-022**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/6/2016 15:45:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/6/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Dark brown, silty sand, gravel/fill									0.7	
	0.25		0.5	Same as above, with black staining, moist, odor									1.5	
	0.5		1	Brownish black, silty sand, dry.									22.2	
	1		1.5	Wood chips/organics, soil same as above, staining with strong odor. Dry									210	
	1.5		2	Same as above, dominantly wood									167	
	2		2.25	Black gravel									75.4	
	2.25		2.5	Pebbles and gravel, silty sand, trace clay. Brown, no odor									38.9	
	2.5		2.75	Black gravel, debris (glass shard) silty sand. Too compacted to dig deeper									21.2	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-023**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/21/2016 12:05**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/21/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		1	Brown silty sand, some gravel, trace tan sand, wet									0.5	
	1		1.33	Brown to black sand, some silt to cobbles, moist to wet									13.3	
	1.5		1.83	Black to brown black clay, some brown gravel, tan sand, wet strong odor									81	
		1.8		Groundwater Table										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-025**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/22/2016 12:05**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/22/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.17	Concrete									0	
	0.17		0.33	Gravel									0	
	0.33		1	Green gray silty sand, fine to coarse, gravel, slight stain, odor									101	
	1		1.5	Green gray silty sand, fine to coarse, gravel, slight stain, odor									85.1	
	1.5		1.83	Green gray sand, fine to coarse, cobbles, tan sand, trace brick pieces									1887	
	1.83		2.17	Tan and black sand, coarse, some fine, cobbles, staining, strong odor									1900	
	2.17		2.5	Tan and black sand, coarse, some fine, cobbles, staining, strong odor									1900	
		2.5		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-026**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/22/2016 14:30:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/22/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.42	Concrete									0	
	0.42		1.33	Green gray sand, fine to coarse, gravel, large rocks, highly compacted									0.2	
		1.3		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-027**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 10:40**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown sand, coarse to very coarse, pebbles, moist no odor									0	
	0.25		0.5	Yellow orange clay									0	
	0.5		2	Yellow orange clay									0	
	2		2.5	Black silty sand, some gravel, trace clay, pebbles moist, coarse, stain, odor									429	
	2.5		2.75	black, silty sand, some gravel, moist to wet, stain, strong odor									558	
	2.75		3	SSA									208	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-028**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 10:24**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Alissa Cannon**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown sand, coarse to fine, some silt, gravel, moist									0	
		0.5		Refusal, asphalt										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-029**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 9:05**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Light brown, sand, coarse, some gravel, some silt, moist									0	
	0.25		0.5	Same									0	
	0.5		0.75	Dark brown to dark gray sandy silt, some gravel, some brick pieces, moist									0.6	
	0.75		1	Brown silty sand, some gravel, fine to coarse, cobbles, moist									19.6	
	1		1.5	Dark brown to gray black, silty sand, stain, odor, moist									93.1	
	1.5		1.75	Gray black sandy silt, cobbles, brick pieces, stain, slight odor, dry									73.7	
	1.75		2	Same									59.2	
	2		2.25	SAA									481	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-030**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/14/2016 11:30**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/14/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown sand, coarse to cobble, some gravel, moist									0	
	0.5		1	SAA, yellow orange clay									0	
	1		1.5	Gray to brown gray, sand, coarse to cobble, some gravel, moist, slight odor									2.1	
	1.5		2	SAA									30.8	
	2		2.5	SAA									55.4	
	2.5		2.75	SAA. Refusal at 2.75'									238	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-031**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/14/2016 11:44**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/14/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown sand, coarse to cobble, trace clay, moist										
	0.5		1	Yellow orange clay									0	
	1		2	Gray sand, coarse, some cobbles, gravel, moist to wet, slight odor									1.7	
	2		2.5	SAA									77.9	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-032**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 14:35:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.6	Brown sand, coarse, some yellow orange clay, moist									0	
	0.6		1	Yellow orange clay									0	
	1		2	Gray to green gray sand, coarse, gravel, stained, strong odor									24.3	
	2		2.5	SAA									973	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-033**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 14:15:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown, sand, coarse, gravel cobbles, moist									0	
	0.5		1	Brown sand, coarse, gravel, moist, yellow orange clay									0	
	1		1.5	Yellow orange clay, gray sand, coarse, cobbles, moist									0.5	
	1.5		2	Gray sand, coarse, cobbles, gravel, moist, slight odor									0	
	2		2.25	SAA. Refusal at 2.25'									0.5	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-034**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 13:19:00 AM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown, sand, medium to coarse, gravel, some brick pieces, moist									0	
	0.25		0.5	SAA									0	
	0.5		1	Brown to black, sand, coarse, gravel, stain, odor, yellow orange clay, moist									46.6	
	1		1.5	Yellow orange clay, gray sand, coarse, strong odor									140	
	1.5		1.75	Gray to dark gray, sand, coarse, trace clay, moist, strong odor									430	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-035**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/13/2016 11:35**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/13/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown sand, coarse, cobbles, clay yellow orange, no odor, moist									0	
	0.25		1	Brown, sand, coarse, gravel, some yellow orange clay, moist, no odor, brick pieces									0.5	
	1		1.5										0.5	
	1.5		2	Grey brown sand, coarse gravel, moist, slight odor									7.3	
	2		2.5	Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-036**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/14/2016 8:49**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/14/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown sand, coarse, cobbles, gravel, moist									0.1	
	0.5		1	Yellow orange clay, some brown sand coarse									0	
	1		1.25	Brown gray sand, fine to coarse, gravel, stain, odor, moist									39.4	
	1.25		1.75	SAA										
	1.75		2	Gray sand, coarse, gravel, cobbles, slight stain, strong odor									48	
	2		2.25	SAA. Refusal at 2.25									122	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-037**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/14/2016 9:20**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/14/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Brown sand, coarse to cobble, gravel, moist									0.6	
	0.5		1	Yellow orange clay									0	
	1		1.75	Gray sand coarse to cobble, some silt, gravel, moist, slight stain, strong odor									461	
	1.75		2.25	Gray sand coarse to cobble, some silt, gravel, moist, slight stain, strong odor									812	
		2.3		Refusal										

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-038**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/14/2016 10:17**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/14/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Brown sand, coarse to cobble, gravel, moist									0.2	
	0.25		1.5	Yellow orange clay									0	
	1.5		1.75	Gray to brown gray, sand coarse to cobble, slight stain, slight odor									20	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-039**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/11/2016 14:10:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/11/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Light gray sand, coarse, gravel, pebbles, trace gray orange, wet, no odor. Water at 0.5 feet.									0	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-040**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/7/2016 12:00**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/7/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.5	Dark gray silty sand with black staining pebbles and gravel									105	
	0.5		0.75	Dark gray silty sands with gravel. Dry some staining, light odor									99.9	
	0.75		1	Same, then refusal at 1'. Move 3 feet west, try again										
	1		1.5	Silty sands, gravel, black stained, strong odor									305	
	1.5		1.75	Same									151	
	1.75		2	Same, silty sand, strong odor.									342	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-041**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/7/2016 22:55**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/7/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Sandy, gravel, dry. Grayish.									13.2	
	0.25		0.5	Gray, sands with coarse gravel, dry. Some black staining									386	
	0.5		0.75	Gray to dark gray silty sands, some gravel									279	
	0.75		1.25	Black, sandy silt, some gravel, petro odor									276	
	1.25		1.75	Black stained, then brown, sandy silt, fine gravel									362	
	1.75		2.25	Gray sandy silt, gravel									388	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**PES AOI 6 Evergreen**	**Drilling Contractor:**		**Hole Designation:**	**BH-16-043**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/7/2016 14:45:00 PM**
Client:	**Evergreen**	**Drilling Method:**		**Date Completed:**	**4/7/2016**
Location:	**AOI 6**	**Surface Elevation:**		**CRA Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		0.25	Coarse gravels, sands, gray, dry									43.2	
	0.25		0.5	Dark brown, silty sands, black staining, coarse gravel, odor									113	
	0.5		1	Black silty sands with gravel and pebbles, dry, odor									86	
	1		1.5	Same									184	
	1.5		1.75	Same, silty sands, strong odor									196	
	1.75		2	silty sand, dark brown black, gravel, cobbles, stained, strong odor									115	
	2		2.5	Same									83.1	

Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**Evergreen PES**	**Drilling Contractor**	**US Environmental**	**Hole Designation:**	**B-172**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/6/2016 10:30**
Client:	**Evergreen**	**Drilling Method:**	**Vacuum Soft Dig/Hollow Stem Auger**	**Date Completed:**	**4/7/2016**
Location:	**AOI 6**	**Surface Elevation:**		**GHD Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		2	Very coarse, black gravel, some brown throughout, no odor. PID broke down, dreggar tube was used to check for benzene, and none was present.										
	2		4	Silty clay, dark gray, some gravel, light odor, wet										
	4		10	Same, with chunks of bricks and concrete fill. Refusal at 10' bgs.										

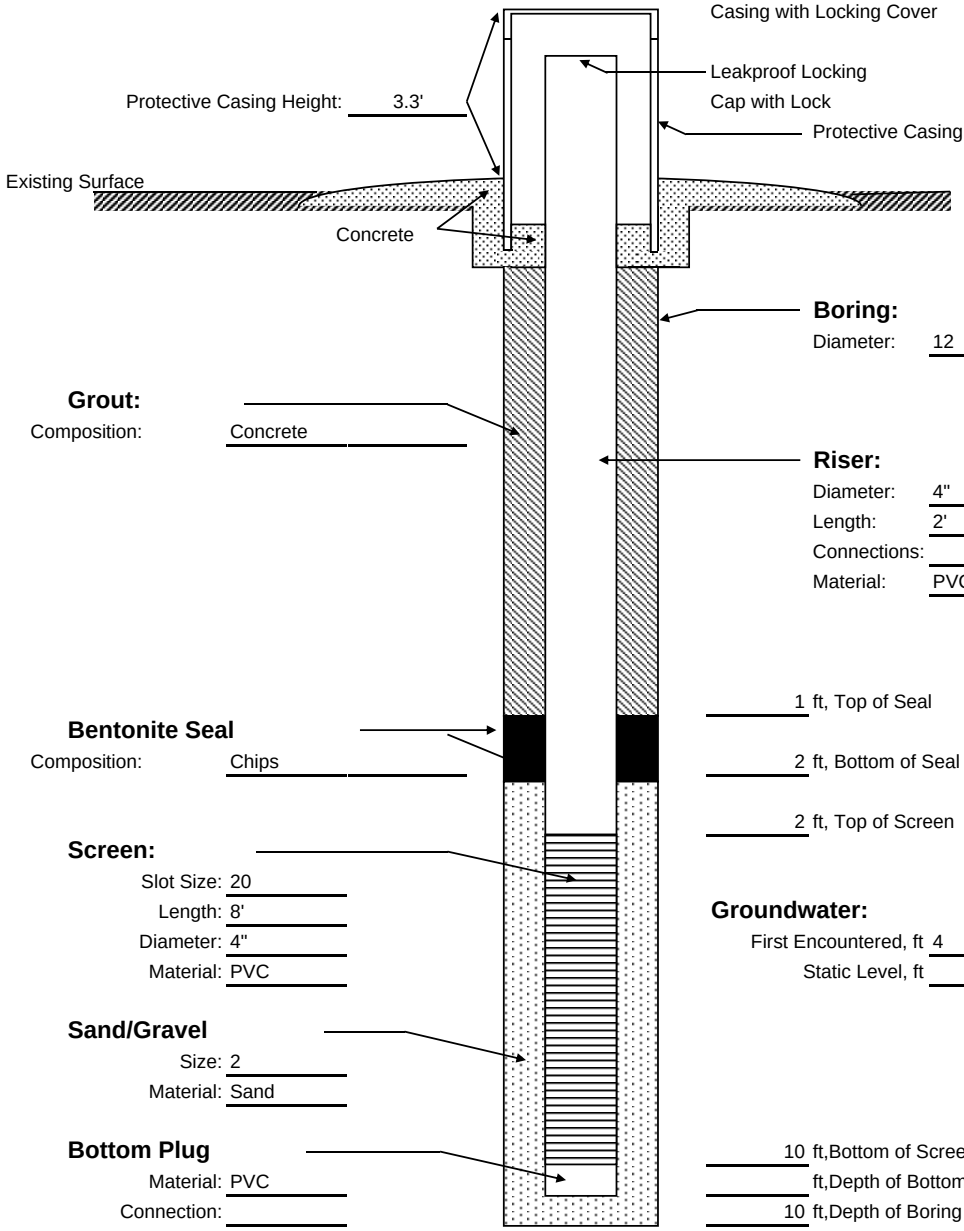
Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

WELL CONSTRUCTION LOG

Project Name:	Evergreen Philadelphia Energy Solutions	Hole Designation:	B-172
Project No.:	11109613	Date Completed:	4/7/2016
Client:	Evergreen Philadelphia Energy Solutions	Drilling Method:	Hollow stem auger
Location:	AOI 6	GHD Supervisor:	Matthew Marcus
Survey Information:			
top of inner casing:		longitude:	
ground:		latitude:	

NOT TO SCALE



6 in. Diam. Above-Ground Security Casing with Locking Cover

Leakproof Locking Cap with Lock

Protective Casing

Protective Casing Height: 3.3'

Boring:
Diameter: 12

Grout:
Composition: Concrete

Riser:
Diameter: 4"
Length: 2'
Connections:
Material: PVC

1 ft, Top of Seal

Bentonite Seal
Composition: Chips

2 ft, Bottom of Seal

2 ft, Top of Screen

Screen:
Slot Size: 20
Length: 8'
Diameter: 4"
Material: PVC

Groundwater:
First Encountered, ft 4
Static Level, ft

Sand/Gravel
Size: 2
Material: Sand

Bottom Plug
Material: PVC
Connection:

10 ft,Bottom of Screen
ft,Depth of Bottom Plug
10 ft,Depth of Boring

Depth from Surface

STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**Evergreen PES**	**Drilling Contractor**	**US Environmental**	**Hole Designation:**	**B-173**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/5/2016 9:50**
Client:	**Evergreen**	**Drilling Method:**	**Vacuum Soft Dig/Hollow Stem Auger**	**Date Completed:**	**4/5/2016**
Location:	**AOI 6**	**Surface Elevation:**		**GHD Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		2	Sand with some gravel, oily, black, stained with heavy hydrocarbon odor.									13.9	
	2		4	Clay, with gravels and silty sand, slight odor, wet, brown to black.									3.4	
	4		8	Same, with chunks of bricks and concrete fill										
	8		12	Sandy silt with some clay, dark brown to black, stained with odor										

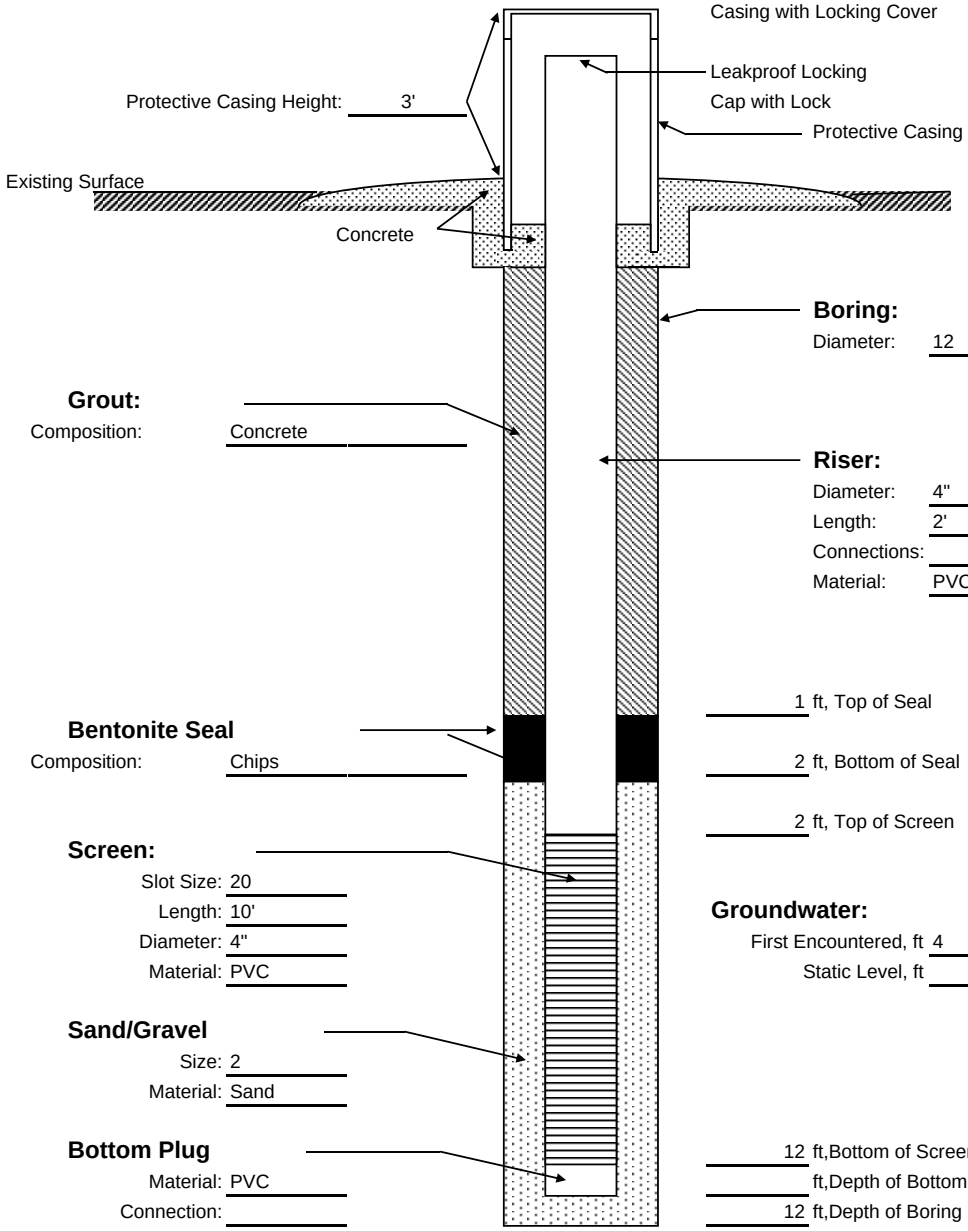
Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

WELL CONSTRUCTION LOG

Project Name:	Evergreen Philadelphia Energy Solutions	Hole Designation:	B-173
Project No.:	11109613	Date Completed:	4/6/2016
Client:	Evergreen Philadelphia Energy Solutions	Drilling Method:	Hollow stem auger
Location:	AOI 6	GHD Supervisor:	
Survey Information:			
top of inner casing:		longitude:	
ground:		latitude:	

NOT TO SCALE



STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**Evergreen PES**	**Drilling Contractor**	**US Environmental**	**Hole Designation:**	**B-174**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/7/2016 9:00**
Client:	**Evergreen**	**Drilling Method:**	**Vacuum Soft Dig/Hollow stem auger**	**Date Completed:**	**4/7/2016**
Location:	**AOI 6**	**Surface Elevation:**		**GHD Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		6"	Silty clay										
	6"		4'	Rocky debris, bricks, chunks of asphalt. All fill										
	4		8	Mostly chunks of asphalt and brick. Some chunks of pure clay										
	8		12	Mostly fill, with clay.										

Notes and Comments

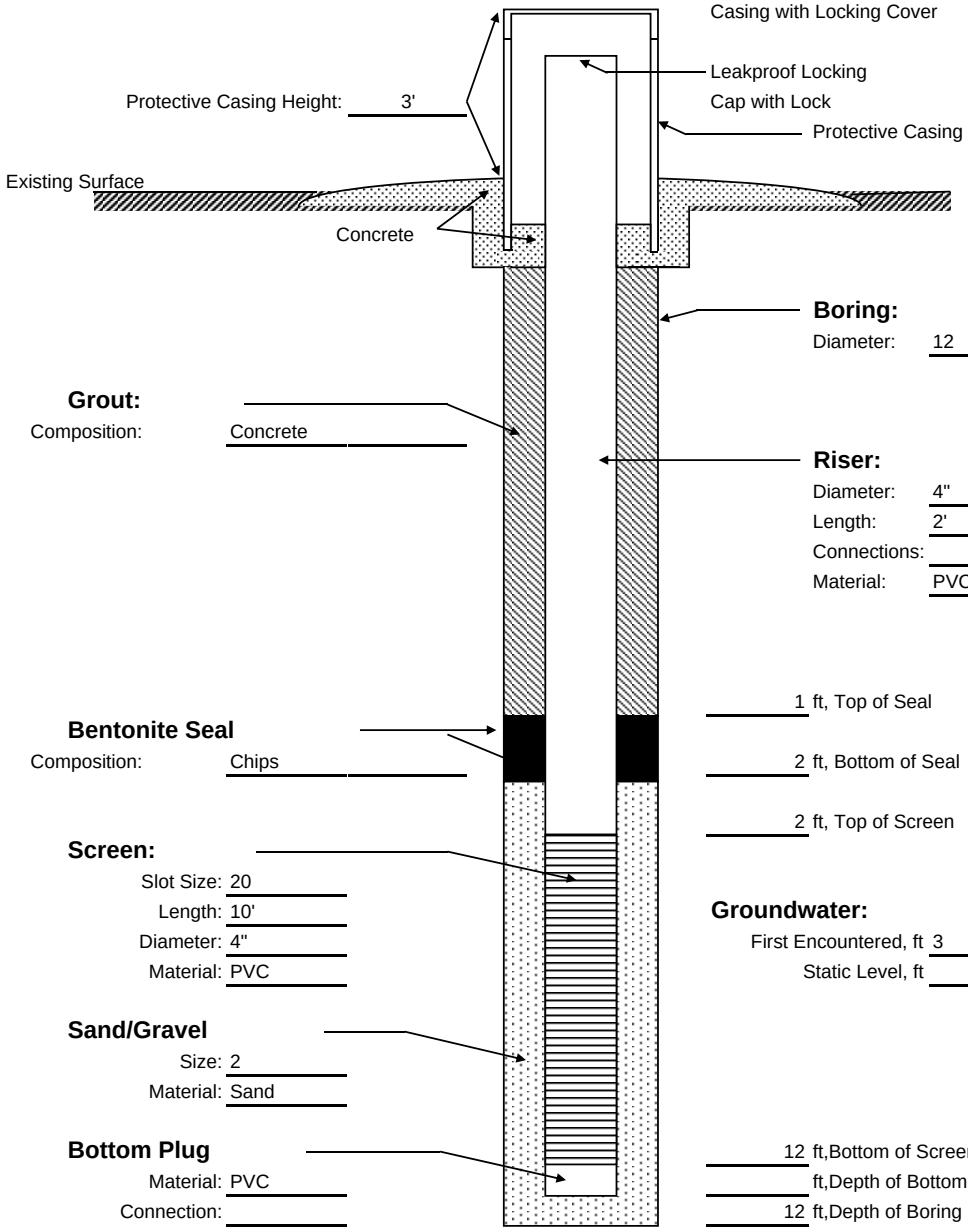
HA - Hand Auger
NA - Not Available
WH - Weight of Hammer

SS - Split-Spoon
NIR: No Instrument Response.

WELL CONSTRUCTION LOG

Project Name:	Evergreen Philadelphia Energy Solutions	Hole Designation:	B-174
Project No.:	11109613	Date Completed:	4/8/2016
Client:	Evergreen Philadelphia Energy Solutions	Drilling Method:	Hollow stem auger
Location:	AOI 6	GHD Supervisor:	Matthew Marcus
Survey Information:			
top of inner casing:		longitude:	
ground:		latitude:	

NOT TO SCALE



STRATIGRAPHY LOG (OVERBURDEN)

Project Name:	**Evergreen PES**	**Drilling Contractor**	**US Environmental**	**Hole Designation:**	**B-175**
Project Number:	**11109613**	**Driller:**		**Date/Time Started:**	**4/5/2016 13:00:00 PM**
Client:	**Evergreen**	**Drilling Method:**	**Vacuum Soft Dig/Hollow stem auger**	**Date Completed:**	**4/5/2016**
Location:	**AOI 6**	**Surface Elevation:**		**GHD Supervisor:**	**Matthew Marcus**

LITHOLOGY	Stratigraphic Intervals (depths in ft bgs) FROM	AT	TO	SAMPLE DESCRIPTION Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	SAMPLE DETAILS SAMPLE #	SAMPLING METHOD	Penetration Record Split Spoon Blows 6"	6"	6"	6"	RECOVERY	SAMPLE INTERVAL	PID (ppm)	N-VALUE
	0		2	Silty clay with some sand, dark brown to black, staining, strong odor, moist									12.1	
	2		4	Clay with some sand, occasional gravel, dark brown to black, moist to wet, strong odor									34.4	
	4		8	Same, higher silt content										
	8		13	Gray to dark gray sandy silt, moist, strong odor, occasional gravel. Brick pieces at 11.5 bgs										

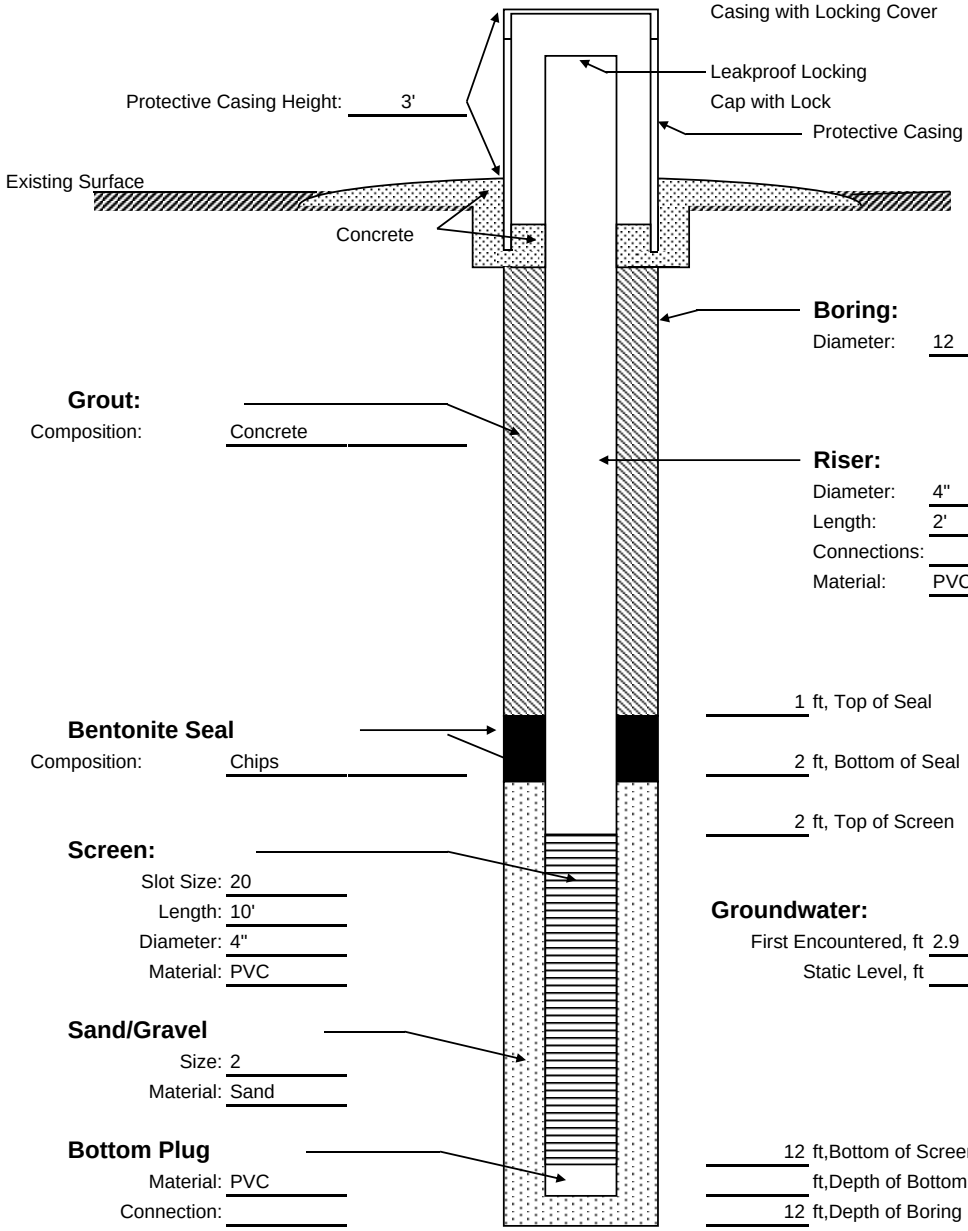
Notes and Comments

HA - Hand Auger
NA - Not Available
WH - Weight of Hammer
SS - Split-Spoon
NIR: No Instrument Response.

WELL CONSTRUCTION LOG

Project Name:	Evergreen Philadelphia Energy Solutions	Hole Designation:	B-175
Project No.:	11109613	Date Completed:	4/7/2016
Client:	Evergreen Philadelphia Energy Solutions	Drilling Method:	Hollow stem auger
Location:	AOI 6	GHD Supervisor:	Matthew Marcus
Survey Information:			
top of inner casing:		longitude:	
ground:		latitude:	

NOT TO SCALE



Appendix D
Laboratory Analytical Reports

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: July 22, 2016

Project: Philadelphia Refinery

Submittal Date: 04/06/2016
Group Number: 1647893
SDG: MHF25
PO Number: 34004491
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-MWB174-0-2-Soil Grab Soil	8321182
AOI6-MWB174-2-4-Soil Grab Soil	8321183
AOI6-BH-16-016-0-2-Soil Grab Soil	8321184
AOI6-BH-16-016-2-4-Soil Grab Soil	8321185
AOI6-MWB173-0-2-Soil Grab Soil	8321186
AOI6-MWB173-2-4-Soil Grab Soil	8321187
AOI6-MWB175-0-2-Soil Grab Soil	8321188
AOI6-MWB175-2- 4-Soil Grab Soil	8321189
AOI6-BH-16-015-0-2-Soil Grab Soil	8321190
AOI6-BH-16-015-2-4-Soil Grab Soil	8321191
AOI6-BH-16-014-0-2-Soil Grab Soil	8321192
AOI6-BH-16-014-2-4-Soil Grab Soil	8321193
AOI6-MWB172-0-2-Soil Grab Soil	8321194
AOI6-MWB172-2-4-Soil Grab Soil	8321195

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

eurofins
Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-MWB174-0-2-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321182
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/04/2016 09:00 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67402 SDG#: MHF25-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	4	0.4	0.72
10237	1,2-Dibromoethane	106-93-4	N.D.	4	0.8	0.72
10237	1,2-Dichloroethane	107-06-2	N.D.	4	0.8	0.72
10237	Ethylbenzene	100-41-4	N.D.	4	0.8	0.72
10237	Isopropylbenzene	98-82-8	N.D.	4	0.8	0.72
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	4	0.4	0.72
10237	Toluene	108-88-3	N.D.	4	0.8	0.72
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	4	0.8	0.72
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	4	0.8	0.72
10237	Xylene (Total)	1330-20-7	N.D.	4	0.8	0.72
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	6.22	1.13	0.383	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	4.8	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X160991AA	04/08/2016 10:54	Jennifer K Howe	0.72
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/04/2016 09:00	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/04/2016 09:00	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/04/2016 09:00	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 04:42	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-MWB174-2-4-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321183
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/04/2016 11:50 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67424 SDG#: MHF25-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	5	5	0.5	0.72
10237	1,2-Dibromoethane	106-93-4	N.D.	5	0.9	0.72
10237	1,2-Dichloroethane	107-06-2	N.D.	5	0.9	0.72
10237	Ethylbenzene	100-41-4	N.D.	5	0.9	0.72
10237	Isopropylbenzene	98-82-8	N.D.	5	0.9	0.72
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	0.72
10237	Toluene	108-88-3	1 J	5	0.9	0.72
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	0.9	0.72
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	0.9	0.72
10237	Xylene (Total)	1330-20-7	N.D.	5	0.9	0.72
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	1,360	7.38	2.51	5
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	24.2	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X160991AA	04/08/2016 11:22	Jennifer K Howe	0.72
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/04/2016 11:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/04/2016 11:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/04/2016 11:50	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/14/2016 13:20	Joanne M Gates	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-016-0-2-Soil Grab Soil
Evergreen/11109613.01

LL Sample # SW 8321184
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/04/2016 16:45 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16602 SDG#: MHF25-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	4	J	6	0.6	0.97
10237	1,2-Dibromoethane	106-93-4	N.D.		6	1	0.97
10237	1,2-Dichloroethane	107-06-2	N.D.		6	1	0.97
10237	Ethylbenzene	100-41-4	N.D.		6	1	0.97
10237	Isopropylbenzene	98-82-8	N.D.		6	1	0.97
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		6	0.6	0.97
10237	Toluene	108-88-3	3	J	6	1	0.97
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		6	1	0.97
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		6	1	0.97
10237	Xylene (Total)	1330-20-7	N.D.		6	1	0.97
	Project defined calibration criteria are not met. The calibration is compliant with the method defined criteria.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	313		1.47	0.498	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	12.5		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161091AA	04/18/2016 21:21	Sara E Johnson	0.97
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/04/2016 16:45	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/04/2016 16:45	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/04/2016 16:45	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 04:49	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-016-2-4-Soil Grab Soil
Evergreen/11109613.01

LL Sample # SW 8321185
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/04/2016 16:55 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16624 SDG#: MHF25-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		340	34	46.13
10237	1,2-Dibromoethane	106-93-4	N.D.		340	68	46.13
10237	1,2-Dichloroethane	107-06-2	N.D.		340	68	46.13
10237	Ethylbenzene	100-41-4	N.D.		340	68	46.13
10237	Isopropylbenzene	98-82-8	440		340	68	46.13
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		340	34	46.13
10237	Toluene	108-88-3	190	J	340	68	46.13
10237	1,2,4-Trimethylbenzene	95-63-6	140	J	340	68	46.13
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		340	68	46.13
10237	Xylene (Total)	1330-20-7	160	J	340	68	46.13
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	256		2.02	0.687	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	32.5		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161061AA	04/15/2016 14:51	Anita M Dale	46.13
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/04/2016 16:55	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/04/2016 16:55	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/04/2016 16:55	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 04:52	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-MWB173-0-2-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321186
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 09:50 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67302 SDG#: MHF25-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	300	J	310	31	50.81
10237	1,2-Dibromoethane	106-93-4	N.D.		310	62	50.81
10237	1,2-Dichloroethane	107-06-2	N.D.		310	62	50.81
10237	Ethylbenzene	100-41-4	N.D.		310	62	50.81
10237	Isopropylbenzene	98-82-8	360		310	62	50.81
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		310	31	50.81
10237	Toluene	108-88-3	130	J	310	62	50.81
10237	1,2,4-Trimethylbenzene	95-63-6	310		310	62	50.81
10237	1,3,5-Trimethylbenzene	108-67-8	130	J	310	62	50.81
10237	Xylene (Total)	1330-20-7	660		310	62	50.81
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	170		1.47	0.499	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	17.5		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 14:56	Anita M Dale	50.81
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 09:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 09:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 09:50	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 04:55	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-MWB173-2-4-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321187
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 10:10 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67324 SDG#: MHF25-06

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	54	J	330	33	43.48
10237	1,2-Dibromoethane	106-93-4	N.D.		330	66	43.48
10237	1,2-Dichloroethane	107-06-2	N.D.		330	66	43.48
10237	Ethylbenzene	100-41-4	N.D.		330	66	43.48
10237	Isopropylbenzene	98-82-8	N.D.		330	66	43.48
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		330	33	43.48
10237	Toluene	108-88-3	380		330	66	43.48
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		330	66	43.48
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		330	66	43.48
10237	Xylene (Total)	1330-20-7	74	J	330	66	43.48
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	315		1.99	0.675	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	34.3		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161062AA	04/15/2016 23:34	Kevin A Sposito	43.48
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 10:10	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 10:10	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 10:10	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 04:59	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

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Analysis Report

Sample Description: AOI6-MWB175-0-2-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321188
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 13:15 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67502 SDG#: MHF25-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1,100		320	32	44.25
10237	1,2-Dibromoethane	106-93-4	N.D.		320	63	44.25
10237	1,2-Dichloroethane	107-06-2	N.D.		320	63	44.25
10237	Ethylbenzene	100-41-4	350		320	63	44.25
10237	Isopropylbenzene	98-82-8	270	J	320	63	44.25
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		320	32	44.25
10237	Toluene	108-88-3	1,300		320	63	44.25
10237	1,2,4-Trimethylbenzene	95-63-6	290	J	320	63	44.25
10237	1,3,5-Trimethylbenzene	108-67-8	260	J	320	63	44.25
10237	Xylene (Total)	1330-20-7	1,600		320	63	44.25
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	207		1.49	0.507	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	30.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 15:19	Anita M Dale	44.25
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 13:15	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 13:15	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 13:15	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:02	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

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Analysis Report

Sample Description: AOI6-MWB175-2- 4-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321189
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 13:20 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67524 SDG#: MHF25-08

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	210	J	340	34	43.03
10237	1,2-Dibromoethane	106-93-4	N.D.		340	69	43.03
10237	1,2-Dichloroethane	107-06-2	N.D.		340	69	43.03
10237	Ethylbenzene	100-41-4	230	J	340	69	43.03
10237	Isopropylbenzene	98-82-8	580		340	69	43.03
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		340	34	43.03
10237	Toluene	108-88-3	500		340	69	43.03
10237	1,2,4-Trimethylbenzene	95-63-6	880		340	69	43.03
10237	1,3,5-Trimethylbenzene	108-67-8	1,500		340	69	43.03
10237	Xylene (Total)	1330-20-7	2,200		340	69	43.03
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	255		2.09	0.710	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	37.5		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 15:41	Anita M Dale	43.03
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 13:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 13:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 13:20	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:06	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

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Analysis Report

Sample Description: AOI6-BH-16-015-0-2-Soil Grab Soil
Evergreen/11109613.01

LL Sample # SW 8321190
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 15:20 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16502 SDG#: MHF25-09

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	53	J	330	33	48.92
10237	1,2-Dibromoethane	106-93-4	N.D.		330	67	48.92
10237	1,2-Dichloroethane	107-06-2	N.D.		330	67	48.92
10237	Ethylbenzene	100-41-4	N.D.		330	67	48.92
10237	Isopropylbenzene	98-82-8	770		330	67	48.92
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		330	33	48.92
10237	Toluene	108-88-3	130	J	330	67	48.92
10237	1,2,4-Trimethylbenzene	95-63-6	110	J	330	67	48.92
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		330	67	48.92
10237	Xylene (Total)	1330-20-7	470		330	67	48.92
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	671		1.60	0.544	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	26.7		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 16:04	Anita M Dale	48.92
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 15:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 15:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 15:20	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:09	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-015-2-4-Soil Grab Soil
Evergreen/11109613.01

LL Sample # SW 8321191
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 15:50 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16524 SDG#: MHF25-10

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		270	27	42.52
10237	1,2-Dibromoethane	106-93-4	N.D.		270	54	42.52
10237	1,2-Dichloroethane	107-06-2	N.D.		270	54	42.52
10237	Ethylbenzene	100-41-4	N.D.		270	54	42.52
10237	Isopropylbenzene	98-82-8	230	J	270	54	42.52
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		270	27	42.52
10237	Toluene	108-88-3	N.D.		270	54	42.52
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		270	54	42.52
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		270	54	42.52
10237	Xylene (Total)	1330-20-7	92	J	270	54	42.52
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	134		1.91	0.651	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	21.6		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161062AA	04/15/2016 23:57	Kevin A Sposito	42.52
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 15:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 15:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 15:50	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:19	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

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Analysis Report

Sample Description: AOI6-BH-16-014-0-2-Soil Grab Soil
Evergreen/11109613.01

LL Sample # SW 8321192
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 16:40 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16402 SDG#: MHF25-11

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	240	J	330	33	43.63
10237	1,2-Dibromoethane	106-93-4	N.D.		330	66	43.63
10237	1,2-Dichloroethane	107-06-2	N.D.		330	66	43.63
10237	Ethylbenzene	100-41-4	95	J	330	66	43.63
10237	Isopropylbenzene	98-82-8	N.D.		330	66	43.63
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		330	33	43.63
10237	Toluene	108-88-3	260	J	330	66	43.63
10237	1,2,4-Trimethylbenzene	95-63-6	110	J	330	66	43.63
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		330	66	43.63
10237	Xylene (Total)	1330-20-7	280	J	330	66	43.63
	Reporting limits were raised due to interference from the sample matrix.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	344		1.56	0.531	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	33.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161062AA	04/15/2016 19:44	Kevin A Sposito	43.63
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 16:40	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 16:40	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 16:40	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:22	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-014-2-4-Soil Grab Soil
Evergreen/11109613.01

LL Sample # SW 8321193
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/05/2016 17:20 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16424 SDG#: MHF25-12

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		440	44	48.64
10237	1,2-Dibromoethane	106-93-4	N.D.		440	87	48.64
10237	1,2-Dichloroethane	107-06-2	N.D.		440	87	48.64
10237	Ethylbenzene	100-41-4	N.D.		440	87	48.64
10237	Isopropylbenzene	98-82-8	N.D.		440	87	48.64
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		440	44	48.64
10237	Toluene	108-88-3	290	J	440	87	48.64
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		440	87	48.64
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		440	87	48.64
10237	Xylene (Total)	1330-20-7	100	J	440	87	48.64
	Reporting limits were raised due to interference from the sample matrix.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	352		2.24	0.763	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	44.3		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161062AA	04/15/2016 20:07	Kevin A Sposito	48.64
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/05/2016 17:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/05/2016 17:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/05/2016 17:20	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:25	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-MWB172-0-2-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321194
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 10:30 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67202 SDG#: MHF25-13

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	210	J	380	38	64.77
10237	1,2-Dibromoethane	106-93-4	N.D.		380	76	64.77
10237	1,2-Dichloroethane	107-06-2	N.D.		380	76	64.77
10237	Ethylbenzene	100-41-4	100	J	380	76	64.77
10237	Isopropylbenzene	98-82-8	N.D.		380	76	64.77
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		380	38	64.77
10237	Toluene	108-88-3	580		380	76	64.77
10237	1,2,4-Trimethylbenzene	95-63-6	110	J	380	76	64.77
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		380	76	64.77
10237	Xylene (Total)	1330-20-7	510		380	76	64.77
	Reporting limits were raised due to interference from the sample matrix.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	168		1.33	0.452	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	14.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161062AA	04/15/2016 20:30	Kevin A Sposito	64.77
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/06/2016 10:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/06/2016 10:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/06/2016 10:30	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:29	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-MWB172-2-4-Soil Grab Soil Evergreen/11109613.01

LL Sample # SW 8321195
LL Group # 1647893
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 10:45 by MM

Submitted: 04/06/2016 18:00
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

67224 SDG#: MHF25-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		410	41	46.9
10237	1,2-Dibromoethane	106-93-4	N.D.		410	81	46.9
10237	1,2-Dichloroethane	107-06-2	N.D.		410	81	46.9
10237	Ethylbenzene	100-41-4	N.D.		410	81	46.9
10237	Isopropylbenzene	98-82-8	N.D.		410	81	46.9
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		410	41	46.9
10237	Toluene	108-88-3	410		410	81	46.9
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		410	81	46.9
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		410	81	46.9
10237	Xylene (Total)	1330-20-7	91	J	410	81	46.9
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	208		1.96	0.666	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	42.4		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161062AA	04/15/2016 20:53	Kevin A Sposito	46.9
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201609840735	04/06/2016 10:45	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201609840735	04/06/2016 10:45	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201609840735	04/06/2016 10:45	Client Supplied	1
06955	Lead	SW-846 6010B	1	161025708004	04/13/2016 05:32	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161025708004	04/12/2016 06:20	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16098820012B	04/08/2016 12:05	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1647893

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: R161061AA	Sample number(s): 8321185		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: R161062AA	Sample number(s): 8321187,8321191-8321195		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: R161072AA	Sample number(s): 8321186,8321188-8321190		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: X160991AA	Sample number(s): 8321182-8321183		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1647893

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: X161091AA	Sample number(s): 8321184		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
	mg/kg	mg/kg	mg/kg
Batch number: 161025708004	Sample number(s): 8321182-8321195		
Lead	N.D.	1.50	0.510

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: R161061AA	Sample number(s): 8321185								
Benzene	1000	1004.78	1000	985.37	100	99	80-120	2	30
1,2-Dibromoethane	1000	937.35	1000	927.09	94	93	80-120	1	30
1,2-Dichloroethane	1000	1024.95	1000	995.6	102	100	77-130	3	30
Ethylbenzene	1000	925.99	1000	924.05	93	92	80-120	0	30
Isopropylbenzene	1000	930	1000	892.8	93	89	70-120	4	30
Methyl Tertiary Butyl Ether	1000	1020.6	1000	981.54	102	98	72-120	4	30
Toluene	1000	926.36	1000	950.61	93	95	80-120	3	30
1,2,4-Trimethylbenzene	1000	900.37	1000	899.5	90	90	74-120	0	30
1,3,5-Trimethylbenzene	1000	922.42	1000	900.52	92	90	73-120	2	30
Xylene (Total)	3000	2805.07	3000	2809.08	94	94	80-120	0	30
Batch number: R161062AA	Sample number(s): 8321187,8321191-8321195								
Benzene	1000	986.57	1000	996.91	99	100	80-120	1	30
1,2-Dibromoethane	1000	909.65	1000	908.94	91	91	80-120	0	30
1,2-Dichloroethane	1000	996.48	1000	985.44	100	99	77-130	1	30
Ethylbenzene	1000	892.51	1000	918.59	89	92	80-120	3	30
Isopropylbenzene	1000	901.18	1000	931.72	90	93	70-120	3	30
Methyl Tertiary Butyl Ether	1000	943.52	1000	979.86	94	98	72-120	4	30
Toluene	1000	917.2	1000	931.79	92	93	80-120	2	30
1,2,4-Trimethylbenzene	1000	838.75	1000	851.46	84	85	74-120	2	30
1,3,5-Trimethylbenzene	1000	860.49	1000	855.52	86	86	73-120	1	30
Xylene (Total)	3000	2764.51	3000	2819.32	92	94	80-120	2	30
Batch number: R161072AA	Sample number(s): 8321186,8321188-8321190								

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1647893

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzene	1000	1014.84	1000	1038.9	101	104	80-120	2	30
1,2-Dibromoethane	1000	917.66	1000	933.68	92	93	80-120	2	30
1,2-Dichloroethane	1000	1021.41	1000	1022.09	102	102	77-130	0	30
Ethylbenzene	1000	921.28	1000	929.61	92	93	80-120	1	30
Isopropylbenzene	1000	931.71	1000	927.21	93	93	70-120	0	30
Methyl Tertiary Butyl Ether	1000	995.54	1000	1004	100	100	72-120	1	30
Toluene	1000	923.91	1000	942.96	92	94	80-120	2	30
1,2,4-Trimethylbenzene	1000	887.01	1000	896.75	89	90	74-120	1	30
1,3,5-Trimethylbenzene	1000	906.87	1000	902.62	91	90	73-120	0	30
Xylene (Total)	3000	2778.71	3000	2810.76	93	94	80-120	1	30
Batch number: X160991AA	Sample number(s): 8321182-8321183								
Benzene	20	20.27	20	19.98	101	100	80-120	1	30
1,2-Dibromoethane	20	17.83	20	18.47	89	92	80-120	4	30
1,2-Dichloroethane	20	20.99	20	21.37	105	107	77-130	2	30
Ethylbenzene	20	19.46	20	19.46	97	97	80-120	0	30
Isopropylbenzene	20	18.62	20	18.48	93	92	70-120	1	30
Methyl Tertiary Butyl Ether	20	18.4	20	18.77	92	94	72-120	2	30
Toluene	20	19.42	20	19.36	97	97	80-120	0	30
1,2,4-Trimethylbenzene	20	18.52	20	18.32	93	92	74-120	1	30
1,3,5-Trimethylbenzene	20	18.27	20	18.12	91	91	73-120	1	30
Xylene (Total)	60	55.89	60	55.44	93	92	80-120	1	30
Batch number: X161091AA	Sample number(s): 8321184								
Benzene	20	22.77	20	22.9	114	115	80-120	1	30
1,2-Dibromoethane	20	18.76	20	19.02	94	95	80-120	1	30
1,2-Dichloroethane	20	23.37	20	23.48	117	117	77-130	0	30
Ethylbenzene	20	21.48	20	21.7	107	108	80-120	1	30
Isopropylbenzene	20	20.11	20	20.33	101	102	70-120	1	30
Methyl Tertiary Butyl Ether	20	19	20	19.18	95	96	72-120	1	30
Toluene	20	21.46	20	21.73	107	109	80-120	1	30
1,2,4-Trimethylbenzene	20	19.56	20	19.64	98	98	74-120	0	30
1,3,5-Trimethylbenzene	20	19.55	20	19.63	98	98	73-120	0	30
Xylene (Total)	60	60.93	60	61.19	102	102	80-120	0	30
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161025708004	Sample number(s): 8321182-8321195								
Lead	15	15.06			100		80-120		
	%	%	%	%					
Batch number: 16098820012B	Sample number(s): 8321182-8321195								
Moisture	89.5	89.4			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1647893

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 161025708004	Sample number(s): 8321182-8321195 UNSPK: P325009									
Lead	13.89	12.93	26.27	12.82	26.49	96	98	75-125	1	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161025708004	Sample number(s): 8321182-8321195 BKG: P325009			
Lead	13.89	14.2	2	20
	%	%		
Batch number: 16098820012B	Sample number(s): 8321182-8321195 BKG: P321534			
Moisture	98.66	98.59	0	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- Solid by 8260B
Batch number: R161061AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8321185	65	59	57	60
Blank	94	97	89	82
LCS	95	99	86	83
LCSD	96	98	88	81
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: R161062AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8321187	58	49*	51*	39*
8321191	64	64	58	60
8321192	49*	48*	34*	32*
8321193	57	51*	49*	50
8321194	69	68	60	55
8321195	52	47*	44*	37*
Blank	94	92	85	80
LCS	94	93	83	80

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1647893

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
LCSD	93	92	84	82
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: R161072AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8321186	66	66	61	59
8321188	63	60	58	55
8321189	55	56	47*	48*
8321190	67	68	47*	51
Blank	96	98	84	80
LCS	97	94	84	82
LCSD	101	96	87	83
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X160991AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8321182	97	105	98	97
8321183	98	105	100	98
Blank	101	98	101	97
LCS	100	95	102	100
LCSD	99	97	101	101
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161091AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8321184	102	106	99	97
Blank	101	98	101	96
LCS	100	96	102	102
LCSD	99	96	102	100
Limits:	50-141	54-135	52-141	50-131

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1647893 Sample # 8321182-96

COC # 496129

Client Information

Client: Evergreen 10177

Acct. #:

Project Name/#: Evergreen / 11109613.01

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Matt Marcus

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#: 186694

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

1 of 2

Sample Identification	Collected Date	Collected Time	Grab	Composite	Sediment	Ground	Surface	Potable	NPDES	Soil ☒	Water	Other:	Total # of Containers	VOCs	moisture, Lead, select VOCs
AOI6-MWB174-0-2-soil	4/4/16	0900	X							5			5	4	1
AOI6-MWB174-2-4-soil	4/4/16	1150	X							5			5	4	1
AOI6-BH-16-016-0-2-soil	4/4/16	1645	X							5			5	4	1
AOI6-BH-16-016-2-4-soil	4/4/16	1655	X							5			5	4	1
AOI6-MWB173-0-2-soil	4/5/16	0950	X							5			5	4	1
AOI6-MWB173-2-4-soil	4/5/16	1010	X							5			5	4	1
AOI6-MWB175-0-2-soil	4/5/16	13:15	X							5			5	4	1
AOI6-MWB175-2-4-soil	4/5/16	13:20	X							5			5	4	1
AOI-6-BH16-015-0-2-soil	4/5/16	15:20	X							5			5	4	1
AOI-6-BH-16-015-2-4-soil	4/5/16	1550	X							5			5	4	1

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	4/1/16	0940			
Matthew Marcus	4/6/16	1440	[illegible]	4/6/16	1440
[illegible]	4/6/16	1500			
			[illegible]	4/6/16	1800

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.4 °C

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7044 1115

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1647893 Sample # 8321182-96

COC # 496128

Client Information

Client: 10177	Acct. #:
Project Name/#: Evergreen/11109613.01	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Matt Marcus	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Sediment ☐ Soil ☒ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other:

Analysis Requested — Preservation Codes

For Lab Use Only: FSC: ____ SCR#: ____

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	VOC	Moisture, Lead, select VOC									Remarks
																			2 of 2
AOI6-BH-16-014-0-2-Soil	4/5/16	16:40	X		5			5	4	1									
AOI6-BH-16-014-2-4-Soil	4/5/16	17:20	X		5			5	4	1									
AOI6-MWB172-0-2-Soil	4/6/16	10:30	X		5			5	4	1									
AOI6-MWB172-2-4-Soil	4/6/16	10:45	X		5			5	4	1									

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	4/6/16	14:40	[signature]	4/6/16	14:40
[signature]	4/6/16	1800			
			[signature]	4/6/16	1800

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.4 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 141926

Group Number(s): 1647893

Client: GHD

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	04/06/2016 18:00
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	3
Samples Intact:	Yes	Trip Blank Type:	See Below
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	Yes		
Discrepancy in Container Qty on COC:	No		

Trip Blank Type(s): 1-MeOH, 2-NaHSO4

Unpacked by Patrick Engle (3472) at 19:20 on 04/06/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.4	DT	Wet	Y	Bagged	N
2	DT121	0.4	DT	Wet	Y	Bagged	N

Extra Sample Details

Sample ID on Label	Number of Extra Containers	Date on Label	Comments
TB-11109613-4/5/16-01	3	4/05/2016 10:45	

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Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: July 22, 2016

Project: Philadelphia Refinery

Submittal Date: 04/08/2016
Group Number: 1648963
SDG: MHF27
PO Number: 34004491
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-MW13-171-0-2-Soil Grab Soil	8325908
AOI6-BH16-040-0-2-Soil Grab Soil	8325909
AOI6-BH16-022-0-2-Soil Grab Soil	8325910
AOI6-BH16-43-0-2-Soil Grab Soil	8325911
AOI6-BH16-041-2-4-Soil Grab Soil	8325912
AOI6-BH16-043-2-4-Soil Grab Soil	8325913
AOI6-BH16-040-2-4-Soil Grab Soil	8325914
AOI6-BH16-022-2-4-Soil Grab Soil	8325915
AOI6-BH16-041-0-2-Soil Grab Soil	8325916

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-MW13-171-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325908
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 14:30 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

13171 SDG#: MHF27-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1	J	4	0.4	0.82
10237	1,2-Dibromoethane	106-93-4	N.D.		4	0.9	0.82
10237	1,2-Dichloroethane	107-06-2	N.D.		4	0.9	0.82
10237	Ethylbenzene	100-41-4	N.D.		4	0.9	0.82
10237	Isopropylbenzene	98-82-8	N.D.		4	0.9	0.82
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4	0.4	0.82
10237	Toluene	108-88-3	N.D.		4	0.9	0.82
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4	0.9	0.82
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4	0.9	0.82
10237	Xylene (Total)	1330-20-7	N.D.		4	0.9	0.82

The LCS and/or LCSD recoveries are outside the stated QC window but within the marginal exceedance allowance of +/- 4 standard deviations as defined in the NELAC/DoD Standards. The following analytes are accepted based on this allowance: o-xylene.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	120		90	18	5
10727	Benzo(a)anthracene	56-55-3	440		90	18	5
10727	Benzo(a)pyrene	50-32-8	450		90	18	5
10727	Benzo(b)fluoranthene	205-99-2	540		90	18	5
10727	Benzo(g,h,i)perylene	191-24-2	290		90	18	5
10727	Chrysene	218-01-9	420		90	18	5
10727	Fluorene	86-73-7	44	J	90	18	5
10727	Naphthalene	91-20-3	230		90	18	5
10727	Phenanthrene	85-01-8	220		90	18	5
10727	Pyrene	129-00-0	500		90	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	45.7		1.13	0.383	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	6.2		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-MW13-171-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325908
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 14:30 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

13171 SDG#: MHF27-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161031AA	04/13/2016 00:22	Christopher G Torres	0.82
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/06/2016 14:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/06/2016 14:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/06/2016 14:30	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/17/2016 21:16	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:05	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-040-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325909
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 12:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16040 SDG#: MHF27-02

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1,100	J	1,100	110	198.81
10237	1,2-Dibromoethane	106-93-4	N.D.		1,100	220	198.81
10237	1,2-Dichloroethane	107-06-2	N.D.		1,100	220	198.81
10237	Ethylbenzene	100-41-4	760	J	1,100	220	198.81
10237	Isopropylbenzene	98-82-8	1,200		1,100	220	198.81
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1,100	110	198.81
10237	Toluene	108-88-3	N.D.		1,100	220	198.81
10237	1,2,4-Trimethylbenzene	95-63-6	330	J	1,100	220	198.81
10237	1,3,5-Trimethylbenzene	108-67-8	380	J	1,100	220	198.81
10237	Xylene (Total)	1330-20-7	880	J	1,100	220	198.81
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,700		190	37	10
10727	Benzo(a)anthracene	56-55-3	3,100		190	37	10
10727	Benzo(a)pyrene	50-32-8	2,200		190	37	10
10727	Benzo(b)fluoranthene	205-99-2	3,200		190	37	10
10727	Benzo(g,h,i)perylene	191-24-2	1,200		190	37	10
10727	Chrysene	218-01-9	2,900		190	37	10
10727	Fluorene	86-73-7	1,600		190	37	10
10727	Naphthalene	91-20-3	3,200		190	37	10
10727	Phenanthrene	85-01-8	6,700		190	37	10
10727	Pyrene	129-00-0	6,400		190	37	10
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	249		1.36	0.464	1
Wet Chemistry	**SW-846 9045D modified**		**Std. Units**		**Std. Units**	**Std. Units**	
00394	pH in soil	n.a.	8.15		0.0100	0.0100	1
	The pH was measured in water at 20.4 C.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	10.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-040-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325909
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 12:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16040 SDG#: MHF27-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 11:07	Anita M Dale	198.81
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/07/2016 12:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/07/2016 12:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/07/2016 12:20	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/18/2016 22:34	Kelli M Barto	10
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:09	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00394	pH in soil	SW-846 9045D modified	1	16104039402A	04/13/2016 13:00	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-022-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325910
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 16:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16022 SDG#: MHF27-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	89	J	240	24	42.16
10237	1,2-Dibromoethane	106-93-4	N.D.		240	48	42.16
10237	1,2-Dichloroethane	107-06-2	N.D.		240	48	42.16
10237	Ethylbenzene	100-41-4	52	J	240	48	42.16
10237	Isopropylbenzene	98-82-8	N.D.		240	48	42.16
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		240	24	42.16
10237	Toluene	108-88-3	150	J	240	48	42.16
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		240	48	42.16
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		240	48	42.16
10237	Xylene (Total)	1330-20-7	180	J	240	48	42.16
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,100		97	19	5
10727	Benzo(a)anthracene	56-55-3	3,400		97	19	5
10727	Benzo(a)pyrene	50-32-8	4,100		97	19	5
10727	Benzo(b)fluoranthene	205-99-2	5,300		97	19	5
10727	Benzo(g,h,i)perylene	191-24-2	3,300		97	19	5
10727	Chrysene	218-01-9	4,900		97	19	5
10727	Fluorene	86-73-7	1,600		97	19	5
10727	Naphthalene	91-20-3	3,500		97	19	5
10727	Phenanthrene	85-01-8	5,400		97	19	5
10727	Pyrene	129-00-0	7,900		97	19	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	236		1.42	0.482	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	12.5		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 10:44	Anita M Dale	42.16
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/06/2016 16:20	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-022-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325910
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 16:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16022 SDG#: MHF27-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/06/2016 16:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/06/2016 16:20	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/18/2016 22:59	Kelli M Barto	5
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:19	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-43-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325911
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 14:52 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16430 SDG#: MHF27-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	810		220	22	40.98
10237	1,2-Dibromoethane	106-93-4	N.D.		220	45	40.98
10237	1,2-Dichloroethane	107-06-2	N.D.		220	45	40.98
10237	Ethylbenzene	100-41-4	64	J	220	45	40.98
10237	Isopropylbenzene	98-82-8	55	J	220	45	40.98
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		220	22	40.98
10237	Toluene	108-88-3	190	J	220	45	40.98
10237	1,2,4-Trimethylbenzene	95-63-6	45	J	220	45	40.98
10237	1,3,5-Trimethylbenzene	108-67-8	46	J	220	45	40.98
10237	Xylene (Total)	1330-20-7	330		220	45	40.98
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	260		91	18	5
10727	Benzo(a)anthracene	56-55-3	710		91	18	5
10727	Benzo(a)pyrene	50-32-8	1,100		91	18	5
10727	Benzo(b)fluoranthene	205-99-2	1,500		91	18	5
10727	Benzo(g,h,i)perylene	191-24-2	1,300		91	18	5
10727	Chrysene	218-01-9	780		91	18	5
10727	Fluorene	86-73-7	50	J	91	18	5
10727	Naphthalene	91-20-3	270		91	18	5
10727	Phenanthrene	85-01-8	420		91	18	5
10727	Pyrene	129-00-0	860		91	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	331		1.39	0.474	1
Wet Chemistry	**SW-846 9045D modified**		**Std. Units**		**Std. Units**	**Std. Units**	
00394	pH in soil The pH was measured in water at 20.5 C.	n.a.	9.15		0.0100	0.0100	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	n.a.	8.0		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

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Analysis Report

Sample Description: AOI6-BH16-43-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325911
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 14:52 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16430 SDG#: MHF27-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161091AA	04/18/2016 14:36	Anita M Dale	40.98
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/07/2016 14:52	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/07/2016 14:52	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/07/2016 14:52	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/18/2016 23:24	Kelli M Barto	5
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:22	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00394	pH in soil	SW-846 9045D modified	1	16104039402A	04/13/2016 13:00	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-041-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325912
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 11:35 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16041 SDG#: MHF27-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	4,300		3,200	320	529.66
10237	1,2-Dibromoethane	106-93-4	N.D.		3,200	650	529.66
10237	1,2-Dichloroethane	107-06-2	N.D.		3,200	650	529.66
10237	Ethylbenzene	100-41-4	17,000		3,200	650	529.66
10237	Isopropylbenzene	98-82-8	6,400		3,200	650	529.66
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		3,200	320	529.66
10237	Toluene	108-88-3	2,500	J	3,200	650	529.66
10237	1,2,4-Trimethylbenzene	95-63-6	47,000		3,200	650	529.66
10237	1,3,5-Trimethylbenzene	108-67-8	22,000		3,200	650	529.66
10237	Xylene (Total)	1330-20-7	39,000		3,200	650	529.66
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,700		210	40	10
10727	Benzo(a)anthracene	56-55-3	5,800		210	40	10
10727	Benzo(a)pyrene	50-32-8	5,300		210	40	10
10727	Benzo(b)fluoranthene	205-99-2	7,800		210	40	10
10727	Benzo(g,h,i)perylene	191-24-2	3,900		210	40	10
10727	Chrysene	218-01-9	5,600		210	40	10
10727	Fluorene	86-73-7	2,800		210	40	10
10727	Naphthalene	91-20-3	12,000		210	40	10
10727	Phenanthrene	85-01-8	13,000		210	40	10
10727	Pyrene	129-00-0	11,000		210	40	10
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	196		1.27	0.431	1
Wet Chemistry	**SW-846 9045D modified**		**Std. Units**		**Std. Units**	**Std. Units**	
00394	pH in soil	n.a.	7.86		0.0100	0.0100	1
	The pH was measured in water at 20.5 C.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	17.9		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

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Analysis Report

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Sample Description: AOI6-BH16-041-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325912
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 11:35 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16041 SDG#: MHF27-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 12:38	Anita M Dale	529.66
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/07/2016 11:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/07/2016 11:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/07/2016 11:35	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/18/2016 23:49	Kelli M Barto	10
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:26	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00394	pH in soil	SW-846 9045D modified	1	16104039402A	04/13/2016 13:00	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-043-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325913
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 15:50 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16043 SDG#: MHF27-06

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1,300		240	24	42.88
10237	1,2-Dibromoethane	106-93-4	N.D.		240	47	42.88
10237	1,2-Dichloroethane	107-06-2	N.D.		240	47	42.88
10237	Ethylbenzene	100-41-4	130	J	240	47	42.88
10237	Isopropylbenzene	98-82-8	230	J	240	47	42.88
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		240	24	42.88
10237	Toluene	108-88-3	320		240	47	42.88
10237	1,2,4-Trimethylbenzene	95-63-6	88	J	240	47	42.88
10237	1,3,5-Trimethylbenzene	108-67-8	81	J	240	47	42.88
10237	Xylene (Total)	1330-20-7	560		240	47	42.88
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	290		93	18	5
10727	Benzo(a)anthracene	56-55-3	900		93	18	5
10727	Benzo(a)pyrene	50-32-8	1,500		93	18	5
10727	Benzo(b)fluoranthene	205-99-2	1,900		93	18	5
10727	Benzo(g,h,i)perylene	191-24-2	1,400		93	18	5
10727	Chrysene	218-01-9	1,100		93	18	5
10727	Fluorene	86-73-7	90	J	93	18	5
10727	Naphthalene	91-20-3	420		93	18	5
10727	Phenanthrene	85-01-8	580		93	18	5
10727	Pyrene	129-00-0	900		93	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	1,720		7.19	2.44	5
Wet Chemistry	**SW-846 9045D modified**		**Std. Units**		**Std. Units**	**Std. Units**	
00394	pH in soil	n.a.	8.84		0.0100	0.0100	1
	The pH was measured in water at 20.7 C.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.3		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

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Analysis Report

Sample Description: AOI6-BH16-043-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325913
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 15:50 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16043 SDG#: MHF27-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161091AA	04/18/2016 14:59	Anita M Dale	42.88
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/07/2016 15:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/07/2016 15:50	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/19/2016 00:14	Kelli M Barto	5
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:45	Cindy M Gehman	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00394	pH in soil	SW-846 9045D modified	1	16104039402A	04/13/2016 13:00	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-040-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325914
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 14:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1640 SDG#: MHF27-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1,400	J	4,900	490	889.68
10237	1,2-Dibromoethane	106-93-4	N.D.		4,900	970	889.68
10237	1,2-Dichloroethane	107-06-2	N.D.		4,900	970	889.68
10237	Ethylbenzene	100-41-4	13,000		4,900	970	889.68
10237	Isopropylbenzene	98-82-8	6,400		4,900	970	889.68
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,900	490	889.68
10237	Toluene	108-88-3	N.D.		4,900	970	889.68
10237	1,2,4-Trimethylbenzene	95-63-6	8,100		4,900	970	889.68
10237	1,3,5-Trimethylbenzene	108-67-8	5,800		4,900	970	889.68
10237	Xylene (Total)	1330-20-7	2,700	J	4,900	970	889.68
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	5,900		180	36	10
10727	Benzo(a)anthracene	56-55-3	5,000		180	36	10
10727	Benzo(a)pyrene	50-32-8	4,900		180	36	10
10727	Benzo(b)fluoranthene	205-99-2	6,300		180	36	10
10727	Benzo(g,h,i)perylene	191-24-2	3,100		180	36	10
10727	Chrysene	218-01-9	5,100		180	36	10
10727	Fluorene	86-73-7	6,400		180	36	10
10727	Naphthalene	91-20-3	36,000		180	36	10
10727	Phenanthrene	85-01-8	21,000		180	36	10
10727	Pyrene	129-00-0	9,700		180	36	10
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	142		1.38	0.468	1
Wet Chemistry	**SW-846 9045D modified**		**Std. Units**		**Std. Units**	**Std. Units**	
00394	pH in soil	n.a.	8.09		0.0100	0.0100	1
	The pH was measured in water at 20.6 C.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.4		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-040-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325914
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 14:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1640 SDG#: MHF27-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 14:10	Anita M Dale	889.68
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/07/2016 14:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/07/2016 14:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/07/2016 14:20	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/19/2016 00:38	Kelli M Barto	10
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:32	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00394	pH in soil	SW-846 9045D modified	1	16104039402A	04/13/2016 13:00	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-022-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325915
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 16:35 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16222 SDG#: MHF27-08

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		5	0.5	0.89
10237	1,2-Dibromoethane	106-93-4	N.D.		5	1	0.89
10237	1,2-Dichloroethane	107-06-2	N.D.		5	1	0.89
10237	Ethylbenzene	100-41-4	N.D.		5	1	0.89
10237	Isopropylbenzene	98-82-8	N.D.		5	1	0.89
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.89
10237	Toluene	108-88-3	N.D.		5	1	0.89
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5	1	0.89
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	1	0.89
10237	Xylene (Total)	1330-20-7	N.D.		5	1	0.89

The LCS and/or LCSD recoveries are outside the stated QC window but within the marginal exceedance allowance of +/- 4 standard deviations as defined in the NELAC/DoD Standards. The following analytes are accepted based on this allowance: o-xylene.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	50		19	4	1
10727	Benzo(a)anthracene	56-55-3	130		19	4	1
10727	Benzo(a)pyrene	50-32-8	140		19	4	1
10727	Benzo(b)fluoranthene	205-99-2	200		19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	110		19	4	1
10727	Chrysene	218-01-9	140		19	4	1
10727	Fluorene	86-73-7	19	J	19	4	1
10727	Naphthalene	91-20-3	45		19	4	1
10727	Phenanthrene	85-01-8	160		19	4	1
10727	Pyrene	129-00-0	210		19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	101		1.50	0.511	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	10.9		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-022-2-4-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325915
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/06/2016 16:35 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16222 SDG#: MHF27-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161031AA	04/13/2016 00:45	Christopher G Torres	0.89
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610040781	04/06/2016 16:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610040781	04/06/2016 16:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610040781	04/06/2016 16:35	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/19/2016 01:03	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:36	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-041-0-2-Soil Grab Soil
Evergreen 10177

LL Sample # SW 8325916
LL Group # 1648963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/07/2016 11:20 by MM

Submitted: 04/08/2016 18:20
Reported: 07/22/2016 13:20

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

16412 SDG#: MHF27-09

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	6,200	200	40	10
10727	Benzo(a)anthracene	56-55-3	12,000	200	40	10
10727	Benzo(a)pyrene	50-32-8	8,000	200	40	10
10727	Benzo(b)fluoranthene	205-99-2	14,000	200	40	10
10727	Benzo(g,h,i)perylene	191-24-2	5,100	200	40	10
10727	Chrysene	218-01-9	12,000	200	40	10
10727	Fluorene	86-73-7	6,800	200	40	10
10727	Naphthalene	91-20-3	22,000	200	40	10
10727	Phenanthrene	85-01-8	25,000	200	40	10
10727	Pyrene	129-00-0	21,000	200	40	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	3,820	8.47	2.88	5
Wet Chemistry	**SW-846 9045D modified**		**Std. Units**	**Std. Units**	**Std. Units**	
00394	pH in soil The pH was measured in water at 21.2 C.	n.a.	7.89	0.0100	0.0100	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	n.a.	16.5	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16106SLC026	04/19/2016 01:29	Kelli M Barto	10
10809	BNA Soil Microwave	SW-846 3546	1	16106SLC026	04/16/2016 12:45	Shawn J McMullen	1
06955	Lead	SW-846 6010B	1	161035708004	04/14/2016 18:49	Cindy M Gehman	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161035708004	04/13/2016 14:02	James L Mertz	1
00394	pH in soil	SW-846 9045D modified	1	16106039402A	04/15/2016 20:15	Luz M Groff	1
00111	Moisture	SM 2540 G-1997	1	16103820006B	04/12/2016 18:47	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1648963

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: Q161091AA	Sample number(s): 8325911,8325913		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: R161072AA	Sample number(s): 8325909-8325910,8325912,8325914		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: X161031AA	Sample number(s): 8325908,8325915		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: 16106SLC026	Sample number(s): 8325908-8325916		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1648963

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3
	mg/kg	mg/kg	mg/kg
Batch number: 161035708004	Sample number(s): 8325908-8325916		
Lead	N.D.	1.50	0.510

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Q161091AA	Sample number(s): 8325911,8325913								
Benzene	1000	982.23	1000	958.11	98	96	80-120	2	30
1,2-Dibromoethane	1000	993.92	1000	987.71	99	99	80-120	1	30
1,2-Dichloroethane	1000	873.42	1000	920.71	87	92	77-130	5	30
Ethylbenzene	1000	961.31	1000	928.79	96	93	80-120	3	30
Isopropylbenzene	1000	974.22	1000	946.46	97	95	70-120	3	30
Methyl Tertiary Butyl Ether	1000	879.04	1000	947.92	88	95	72-120	8	30
Toluene	1000	994.43	1000	964.51	99	96	80-120	3	30
1,2,4-Trimethylbenzene	1000	973.12	1000	940.64	97	94	74-120	3	30
1,3,5-Trimethylbenzene	1000	984.58	1000	938.2	98	94	73-120	5	30
Xylene (Total)	3000	3028.56	3000	2957.64	101	99	80-120	2	30
Batch number: R161072AA	Sample number(s): 8325909-8325910,8325912,8325914								
Benzene	1000	1014.84	1000	1038.9	101	104	80-120	2	30
1,2-Dibromoethane	1000	917.66	1000	933.68	92	93	80-120	2	30
1,2-Dichloroethane	1000	1021.41	1000	1022.09	102	102	77-130	0	30
Ethylbenzene	1000	921.28	1000	929.61	92	93	80-120	1	30
Isopropylbenzene	1000	931.71	1000	927.21	93	93	70-120	0	30
Methyl Tertiary Butyl Ether	1000	995.54	1000	1004	100	100	72-120	1	30
Toluene	1000	923.91	1000	942.96	92	94	80-120	2	30
1,2,4-Trimethylbenzene	1000	887.01	1000	896.75	89	90	74-120	1	30
1,3,5-Trimethylbenzene	1000	906.87	1000	902.62	91	90	73-120	0	30
Xylene (Total)	3000	2778.71	3000	2810.76	93	94	80-120	1	30
Batch number: X161031AA	Sample number(s): 8325908,8325915								
Benzene	20	19	20	18.51	95	93	80-120	3	30
1,2-Dibromoethane	20	16.4	20	16.56	82	83	80-120	1	30
1,2-Dichloroethane	20	19.49	20	19.33	97	97	77-130	1	30
Ethylbenzene	20	17.4	20	17.09	87	85	80-120	2	30
Isopropylbenzene	20	16.56	20	16.16	83	81	70-120	2	30
Methyl Tertiary Butyl Ether	20	16.98	20	16.8	85	84	72-120	1	30
Toluene	20	17.73	20	17.36	89	87	80-120	2	30
1,2,4-Trimethylbenzene	20	15.95	20	15.69	80	78	74-120	2	30
1,3,5-Trimethylbenzene	20	16.02	20	15.61	80	78	73-120	3	30
Xylene (Total)	60	49.72	60	49.04	83	82	80-120	1	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1648963

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16106SLC026	Sample number(s): 8325908-8325916								
Anthracene	1666.67	1643.62			99		82-118		
Benzo(a)anthracene	1666.67	1576.67			95		76-119		
Benzo(a)pyrene	1666.67	1629.45			98		85-117		
Benzo(b)fluoranthene	1666.67	1653.62			99		78-129		
Benzo(g,h,i)perylene	1666.67	1512.75			91		77-118		
Chrysene	1666.67	1605.11			96		80-121		
Fluorene	1666.67	1564.45			94		86-118		
Naphthalene	1666.67	1607.11			96		82-112		
Phenanthrene	1666.67	1588.11			95		80-114		
Pyrene	1666.67	1598.37			96		81-114		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161035708004	Sample number(s): 8325908-8325916								
Lead	15	15.71			105		80-120		
	Std. Units	Std. Units	Std. Units	Std. Units					
Batch number: 16104039402A	Sample number(s): 8325909,8325911-8325914								
pH in soil	7.00	7.03			100		95-105		
Batch number: 16106039402A	Sample number(s): 8325916								
pH in soil	7.00	7.00			100		95-105		
	%	%	%	%					
Batch number: 16103820006B	Sample number(s): 8325908-8325916								
Moisture	89.5	89.39			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16106SLC026	Sample number(s): 8325908-8325916 UNSPK: P323480									
Anthracene	N.D.	1661.13	1676.58	1661.13	1619.71	101	98	82-118	3	30
Benzo(a)anthracene	N.D.	1661.13	1484.18	1661.13	1431.37	89	86	76-119	4	30
Benzo(a)pyrene	N.D.	1661.13	1658.78	1661.13	1553.92	100	94	85-117	7	30
Benzo(b)fluoranthene	N.D.	1661.13	1645.12	1661.13	1564.33	99	94	78-129	5	30
Benzo(g,h,i)perylene	N.D.	1661.13	1665.83	1661.13	1547.33	100	93	77-118	7	30
Chrysene	N.D.	1661.13	1518.71	1661.13	1438.44	91	87	80-121	5	30
Fluorene	N.D.	1661.13	1630.47	1661.13	1569.95	98	95	86-118	4	30
Naphthalene	N.D.	1661.13	1658.39	1661.13	1591.17	100	96	82-112	4	30
Phenanthrene	N.D.	1661.13	1605.26	1661.13	1545.65	97	93	80-114	4	30
Pyrene	N.D.	1661.13	1607.11	1661.13	1527.31	97	92	81-114	5	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1648963

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 161035708004	Sample number(s): 8325908-8325916 UNSPK: P301986									
Lead	247.6	13.16	210.56	13.39	265.51	-281 (2)	134 (2)	75-125	23*	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161035708004	Sample number(s): 8325908-8325916 BKG: P301986			
Lead	247.6	274.04	10	20
	Std. Units	Std. Units		
Batch number: 16104039402A	Sample number(s): 8325909,8325911-8325914 BKG: P324679			
pH in soil	7.43	7.44	0	3
Batch number: 16106039402A	Sample number(s): 8325916 BKG: P328257			
pH in soil	7.47	7.52	1	3
	%	%		
Batch number: 16103820006B	Sample number(s): 8325908-8325916 BKG: P326715			
Moisture	29.24	29.72	2	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- Solid by 8260B
Batch number: Q161091AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8325911	91	89	87	80
8325913	98	95	94	89
Blank	104	106	96	91
LCS	96	94	93	91
LCSD	99	101	92	90
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: R161072AA

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:20

Group Number: 1648963

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8325909	87	87	94	113
8325910	88	86	80	78
8325912	81	78	74	74
8325914	81	90	81	81
Blank	96	98	84	80
LCS	97	94	84	82
LCSD	101	96	87	83
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161031AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8325908	100	103	98	98
8325915	102	108	99	100
Blank	100	99	100	98
LCS	101	102	100	101
LCSD	100	99	101	102
Limits:	50-141	54-135	52-141	50-131

Analysis Name: TCL 8270 (microwave)
Batch number: 16106SLC026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8325908	99	94	96
8325909	208*	94	98
8325910	102	82	91
8325911	102	93	95
8325912	216*	94	92
8325913	98	89	88
8325914	209*	92	97
8325915	100	83	82
8325916	184*	82	83
Blank	90	88	92
LCS	98	92	90
MS	104	93	90
MSD	101	88	86
Limits:	54-123	63-117	59-129

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1648963 Sample # 8325908-17

COC # 496127

Client Information

Client: Evergreen 10177

Acct. #:

Project Name/#: Evergreen 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Matthew Marcus

Quote #:

State where samples were collected: PA

For Compliance: Yes ☐ No ☐

Matrix

Sediment ☐ Ground ☐ Surface ☐ Potable ☐ NPDES ☐ Soil ☑ Water ☐ Other: ____

Analysis Requested / Preservation Codes

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

1/1

Include pH in selected X locations

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOC	Moisture, Lead, select SVOC	pH
AOJ6-MWB171-0-2-Soil	4/6/16	1430	✓		5	4	1	
AOJ6-BH16-040-0-2-Soil	4/7/16	1220	✓		5	4	1	X
AOJ6-BH16-022-0-2-Soil	4/6/16	1620	✓		5	4	1	
AOJ6-BH16-043-0-2-Soil	4/7/16	1452	✓		5	4	1	X
AOJ6-BH16-041-2-4-Soil	4/7/16	1135	✓		5	4	1	X
AOJ6-BH16-043-2-4-Soil	4/7/16	1550	✓		5	4	1	X
AOJ6-BH16-040-2-4-Soil	4/7/16	1420	✓		5	4	1	X
AOJ6-BH16-022-2-4-Soil	4/6/16	1635	✓		5	4	1	
AOJ6-BH16-041-0-2-Soil	4/7/16	1120	✓		1	0	1	X
TB-AOJ6-4-8-16	4/8/16	1220			3	0		

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Matthew Marcus	4/8/16	1745	Bill DeEsy	4/8/16	19:05
Bill DeEsy	4/8/16	18:20			
			Hatya Fernandez	4/8/16	1820

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.6 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 142265

Group Number(s): 1649963

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	04/08/2016 18:20
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	No	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	No
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	3
Samples Intact:	Yes	Trip Blank Type:	MeOH
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Maritza Fernandez (9906) at 20:29 on 04/08/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.6	DT	Wet	Y	Bagged	N

Sample Date/Time Discrepancy Details

Sample ID on COC	Date/Time on Label	Comments
AOIG-BH16-041-2-4 Soil	-- --	

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: July 22, 2016

Project: Philadelphia Refinery

Submittal Date: 04/12/2016
Group Number: 1649742
SDG: MHF28
PO Number: 34004491
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-BH16-007-0-2-Soil Grab Soil	8329537
AOI6-BH16-007-2-4-Soil Grab Soil	8329538
AOI6-BH16-008-0-2-Soil Grab Soil	8329540
AOI6-BH16-008-2-4-Soil Grab Soil	8329541
AOI6-BH16-009-0-2-Soil Grab Soil	8329542
AOI6-BH16-018-0-2-Soil Grab Soil	8329543
AOI6-BH16-017-0-2-Soil Grab Soil	8329544
AOI6-BH16-010-0-2-Soil Grab Soil	8329545
AOI6-BH16-011-0-2-Soil Grab Soil	8329546
AOI6-BH16-039-0-2-Soil Grab Soil	8329547
AOI6-BH16-012-0-2-Soil Grab Soil	8329548
AOI6-BH16-012-0-2-Soil-B Grab Soil	8329549
AOI6-BH16-013-0-2-Soil Grab Soil	8329550

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

Sample Description: AOI6-BH16-007-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329537
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 14:09 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1671 SDG#: MHF28-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	3	J	6	0.6	0.95
10237	1,2-Dibromoethane	106-93-4	N.D.		6	1	0.95
10237	1,2-Dichloroethane	107-06-2	N.D.		6	1	0.95
10237	Ethylbenzene	100-41-4	N.D.		6	1	0.95
10237	Isopropylbenzene	98-82-8	N.D.		6	1	0.95
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		6	0.6	0.95
10237	Toluene	108-88-3	1	J	6	1	0.95
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		6	1	0.95
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		6	1	0.95
10237	Xylene (Total)	1330-20-7	N.D.		6	1	0.95

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	200		20	4	1
10727	Benzo(a)anthracene	56-55-3	720		20	4	1
10727	Benzo(a)pyrene	50-32-8	670		20	4	1
10727	Benzo(b)fluoranthene	205-99-2	950		20	4	1
10727	Benzo(g,h,i)perylene	191-24-2	510		20	4	1
10727	Chrysene	218-01-9	850		20	4	1
10727	Fluorene	86-73-7	70		20	4	1
10727	Naphthalene	91-20-3	630		20	4	1
10727	Phenanthrene	85-01-8	720		20	4	1
10727	Pyrene	129-00-0	1,200		20	4	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	803		1.32	0.450	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	14.7		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-007-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329537
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 14:09 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1671 SDG#: MHF28-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161042AA	04/13/2016 12:51	Jennifer K Howe	0.95
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/08/2016 14:09	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/08/2016 14:09	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/08/2016 14:09	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 01:12	William H Saadeh	1
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 06:40	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-007-2-4-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329538
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 14:38 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1672 SDG#: MHF28-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	4 J	5	0.5	0.76
10237	1,2-Dibromoethane	106-93-4	N.D.	5	0.9	0.76
10237	1,2-Dichloroethane	107-06-2	N.D.	5	0.9	0.76
10237	Ethylbenzene	100-41-4	N.D.	5	0.9	0.76
10237	Isopropylbenzene	98-82-8	N.D.	5	0.9	0.76
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	0.76
10237	Toluene	108-88-3	N.D.	5	0.9	0.76
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	0.9	0.76
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	0.9	0.76
10237	Xylene (Total)	1330-20-7	N.D.	5	0.9	0.76
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	840	20	4	1
10727	Benzo(a)anthracene	56-55-3	2,200	20	4	1
10727	Benzo(a)pyrene	50-32-8	1,800	20	4	1
10727	Benzo(b)fluoranthene	205-99-2	2,300	20	4	1
10727	Benzo(g,h,i)perylene	191-24-2	1,200	20	4	1
10727	Chrysene	218-01-9	2,100	20	4	1
10727	Fluorene	86-73-7	310	20	4	1
10727	Naphthalene	91-20-3	710	20	4	1
10727	Phenanthrene	85-01-8	2,600	20	4	1
10727	Pyrene	129-00-0	3,400	20	4	1
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	243	1.63	0.553	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	17.6	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161042AA	04/13/2016 13:14	Jennifer K Howe	0.76
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/08/2016 14:38	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/08/2016 14:38	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: AOI6-BH16-007-2-4-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329538
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 14:38 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1672 SDG#: MHF28-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/08/2016 14:38	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 01:34	William H Saadeh	1
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 06:43	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-008-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329540
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 14:58 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1681 SDG#: MHF28-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1 J	5	0.5	0.83
10237	1,2-Dibromoethane	106-93-4	N.D.	5	1	0.83
10237	1,2-Dichloroethane	107-06-2	N.D.	5	1	0.83
10237	Ethylbenzene	100-41-4	N.D.	5	1	0.83
10237	Isopropylbenzene	98-82-8	N.D.	5	1	0.83
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	0.83
10237	Toluene	108-88-3	N.D.	5	1	0.83
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	1	0.83
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	1	0.83
10237	Xylene (Total)	1330-20-7	N.D.	5	1	0.83
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,300	190	38	10
10727	Benzo(a)anthracene	56-55-3	5,500	190	38	10
10727	Benzo(a)pyrene	50-32-8	4,800	190	38	10
10727	Benzo(b)fluoranthene	205-99-2	6,300	190	38	10
10727	Benzo(g,h,i)perylene	191-24-2	3,300	190	38	10
10727	Chrysene	218-01-9	5,600	190	38	10
10727	Fluorene	86-73-7	1,700	190	38	10
10727	Naphthalene	91-20-3	2,900	190	38	10
10727	Phenanthrene	85-01-8	10,000	190	38	10
10727	Pyrene	129-00-0	10,000	190	38	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	298	1.35	0.458	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	13.6	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161042AA	04/13/2016 13:38	Jennifer K Howe	0.83
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/08/2016 14:58	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/08/2016 14:58	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-008-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329540
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 14:58 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1681 SDG#: MHF28-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/08/2016 14:58	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 01:55	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 06:46	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-008-2-4-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329541
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 15:19 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
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Suite #3
Niagara Falls NY 14304

B1682 SDG#: MHF28-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1 J	4	0.4	0.68
10237	1,2-Dibromoethane	106-93-4	N.D.	4	0.8	0.68
10237	1,2-Dichloroethane	107-06-2	N.D.	4	0.8	0.68
10237	Ethylbenzene	100-41-4	N.D.	4	0.8	0.68
10237	Isopropylbenzene	98-82-8	N.D.	4	0.8	0.68
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	4	0.4	0.68
10237	Toluene	108-88-3	N.D.	4	0.8	0.68
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	4	0.8	0.68
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	4	0.8	0.68
10237	Xylene (Total)	1330-20-7	N.D.	4	0.8	0.68
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,800	200	38	10
10727	Benzo(a)anthracene	56-55-3	3,700	200	38	10
10727	Benzo(a)pyrene	50-32-8	2,900	200	38	10
10727	Benzo(b)fluoranthene	205-99-2	4,000	200	38	10
10727	Benzo(g,h,i)perylene	191-24-2	2,000	200	38	10
10727	Chrysene	218-01-9	3,700	200	38	10
10727	Fluorene	86-73-7	1,700	200	38	10
10727	Naphthalene	91-20-3	1,500	200	38	10
10727	Phenanthrene	85-01-8	8,800	200	38	10
10727	Pyrene	129-00-0	7,300	200	38	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	267	1.48	0.503	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	14.8	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161051AA	04/14/2016 12:26	Jennifer K Howe	0.68
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/08/2016 15:19	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/08/2016 15:19	Client Supplied	1

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Analysis Report

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Sample Description: AOI6-BH16-008-2-4-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329541
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 15:19 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
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Suite #3
Niagara Falls NY 14304

B1682 SDG#: MHF28-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/08/2016 15:19	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 02:17	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 06:50	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-009-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329542
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 15:54 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

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B1691 SDG#: MHF28-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	5 J	6	0.6	1.02
10237	1,2-Dibromoethane	106-93-4	N.D.	6	1	1.02
10237	1,2-Dichloroethane	107-06-2	N.D.	6	1	1.02
10237	Ethylbenzene	100-41-4	N.D.	6	1	1.02
10237	Isopropylbenzene	98-82-8	N.D.	6	1	1.02
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	6	0.6	1.02
10237	Toluene	108-88-3	N.D.	6	1	1.02
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	6	1	1.02
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	6	1	1.02
10237	Xylene (Total)	1330-20-7	N.D.	6	1	1.02
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	4,300	19	4	1
10727	Benzo(a)anthracene	56-55-3	5,200	190	38	10
10727	Benzo(a)pyrene	50-32-8	3,300	19	4	1
10727	Benzo(b)fluoranthene	205-99-2	4,000	19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	1,900	19	4	1
10727	Chrysene	218-01-9	5,100	190	38	10
10727	Fluorene	86-73-7	1,400	19	4	1
10727	Naphthalene	91-20-3	1,900	19	4	1
10727	Phenanthrene	85-01-8	14,000	190	38	10
10727	Pyrene	129-00-0	13,000	190	38	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	149	1.16	0.395	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	11.5	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161042AA	04/13/2016 14:24	Jennifer K Howe	1.02
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/08/2016 15:54	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/08/2016 15:54	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-009-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329542
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/08/2016 15:54 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1691 SDG#: MHF28-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/08/2016 15:54	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 02:39	William H Saadeh	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 08:38	Linda M Hartenstine	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 06:54	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-018-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329543
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 11:07 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1618 SDG#: MHF28-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	71		4	0.4	0.77
10237	1,2-Dibromoethane	106-93-4	N.D.		4	0.8	0.77
10237	1,2-Dichloroethane	107-06-2	N.D.		4	0.8	0.77
10237	Ethylbenzene	100-41-4	1	J	4	0.8	0.77
10237	Isopropylbenzene	98-82-8	1	J	4	0.8	0.77
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4	0.4	0.77
10237	Toluene	108-88-3	5		4	0.8	0.77
10237	1,2,4-Trimethylbenzene	95-63-6	1	J	4	0.8	0.77
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4	0.8	0.77
10237	Xylene (Total)	1330-20-7	2	J	4	0.8	0.77

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	670		190	36	10
10727	Benzo(a)anthracene	56-55-3	1,400		190	36	10
10727	Benzo(a)pyrene	50-32-8	1,900		190	36	10
10727	Benzo(b)fluoranthene	205-99-2	2,300		190	36	10
10727	Benzo(g,h,i)perylene	191-24-2	1,500		190	36	10
10727	Chrysene	218-01-9	1,900		190	36	10
10727	Fluorene	86-73-7	480		190	36	10
10727	Naphthalene	91-20-3	2,100		190	36	10
10727	Phenanthrene	85-01-8	1,600		190	36	10
10727	Pyrene	129-00-0	2,400		190	36	10
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	138		1.30	0.443	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.6		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-018-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329543
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 11:07 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1618 SDG#: MHF28-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161042AA	04/13/2016 15:33	Jennifer K Howe	0.77
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 11:07	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 11:07	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 11:07	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 03:01	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 06:57	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-017-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329544
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 11:43 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1617 SDG#: MHF28-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1 J	4	0.4	0.79
10237	1,2-Dibromoethane	106-93-4	N.D.	4	0.9	0.79
10237	1,2-Dichloroethane	107-06-2	N.D.	4	0.9	0.79
10237	Ethylbenzene	100-41-4	N.D.	4	0.9	0.79
10237	Isopropylbenzene	98-82-8	N.D.	4	0.9	0.79
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	4	0.4	0.79
10237	Toluene	108-88-3	N.D.	4	0.9	0.79
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	4	0.9	0.79
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	4	0.9	0.79
10237	Xylene (Total)	1330-20-7	N.D.	4	0.9	0.79
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	350	19	4	1
10727	Benzo(a)anthracene	56-55-3	3,300	19	4	1
10727	Benzo(a)pyrene	50-32-8	4,200	19	4	1
10727	Benzo(b)fluoranthene	205-99-2	6,700	93	18	5
10727	Benzo(g,h,i)perylene	191-24-2	4,800	93	18	5
10727	Chrysene	218-01-9	4,900	93	18	5
10727	Fluorene	86-73-7	81	19	4	1
10727	Naphthalene	91-20-3	120	19	4	1
10727	Phenanthrene	85-01-8	2,400	19	4	1
10727	Pyrene	129-00-0	8,100	93	18	5
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	180	7.26	2.47	5
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	9.4	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161051AA	04/14/2016 12:49	Jennifer K Howe	0.79
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 11:43	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 11:43	Client Supplied	1

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Analysis Report

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Sample Description: AOI6-BH16-017-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329544
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 11:43 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

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Suite #3
Niagara Falls NY 14304

B1617 SDG#: MHF28-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 11:43	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 03:23	William H Saadeh	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 09:00	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/21/2016 11:46	Joanne M Gates	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-010-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329545
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 13:40 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
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Suite #3
Niagara Falls NY 14304

B1610 SDG#: MHF28-09

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	11		5	0.5	0.76
10237	1,2-Dibromoethane	106-93-4	N.D.		5	0.9	0.76
10237	1,2-Dichloroethane	107-06-2	N.D.		5	0.9	0.76
10237	Ethylbenzene	100-41-4	N.D.		5	0.9	0.76
10237	Isopropylbenzene	98-82-8	N.D.		5	0.9	0.76
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.76
10237	Toluene	108-88-3	4	J	5	0.9	0.76
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5	0.9	0.76
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	0.9	0.76
10237	Xylene (Total)	1330-20-7	N.D.		5	0.9	0.76
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	79		21	4	1
10727	Benzo(a)anthracene	56-55-3	210		21	4	1
10727	Benzo(a)pyrene	50-32-8	260		21	4	1
10727	Benzo(b)fluoranthene	205-99-2	410		21	4	1
10727	Benzo(g,h,i)perylene	191-24-2	230		21	4	1
10727	Chrysene	218-01-9	280		21	4	1
10727	Fluorene	86-73-7	12	J	21	4	1
10727	Naphthalene	91-20-3	220		21	4	1
10727	Phenanthrene	85-01-8	230		21	4	1
10727	Pyrene	129-00-0	430		21	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	1,460		1.70	0.577	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	19.7		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161051AA	04/14/2016 14:21	Jennifer K Howe	0.76
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 13:40	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 13:40	Client Supplied	1

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Analysis Report

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Sample Description: AOI6-BH16-010-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329545
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 13:40 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
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Niagara Falls NY 14304

B1610 SDG#: MHF28-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 13:40	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016 00:58	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	2	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 07:05	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-011-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329546
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 13:53 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

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B1611 SDG#: MHF28-10

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	270	27	41.46
10237	1,2-Dibromoethane	106-93-4	N.D.	270	54	41.46
10237	1,2-Dichloroethane	107-06-2	N.D.	270	54	41.46
10237	Ethylbenzene	100-41-4	N.D.	270	54	41.46
10237	Isopropylbenzene	98-82-8	N.D.	270	54	41.46
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	270	27	41.46
10237	Toluene	108-88-3	N.D.	270	54	41.46
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	270	54	41.46
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	270	54	41.46
10237	Xylene (Total)	1330-20-7	N.D.	270	54	41.46
	Reporting limits were raised due to interference from the sample matrix.					
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,700	220	43	10
10727	Benzo(a)anthracene	56-55-3	990	220	43	10
10727	Benzo(a)pyrene	50-32-8	990	220	43	10
10727	Benzo(b)fluoranthene	205-99-2	1,300	220	43	10
10727	Benzo(g,h,i)perylene	191-24-2	690	220	43	10
10727	Chrysene	218-01-9	1,000	220	43	10
10727	Fluorene	86-73-7	8,500	220	43	10
10727	Naphthalene	91-20-3	N.D.	220	43	10
10727	Phenanthrene	85-01-8	10,000	220	43	10
10727	Pyrene	129-00-0	1,900	220	43	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	734	1.73	0.590	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	22.8	0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 09:12	Anita M Dale	41.46
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 13:53	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-011-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329546
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 13:53 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

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Niagara Falls NY 14304

B1611 SDG#: MHF28-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 13:53	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 13:53	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 23:30	Catherine E Bachman	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 07:08	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-039-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329547
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 14:10 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

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2055 Niagara Falls Blvd.
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Niagara Falls NY 14304

B1639 SDG#: MHF28-11

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		5	0.5	0.8
10237	1,2-Dibromoethane	106-93-4	N.D.		5	1	0.8
10237	1,2-Dichloroethane	107-06-2	N.D.		5	1	0.8
10237	Ethylbenzene	100-41-4	N.D.		5	1	0.8
10237	Isopropylbenzene	98-82-8	N.D.		5	1	0.8
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.8
10237	Toluene	108-88-3	N.D.		5	1	0.8
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5	1	0.8
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	1	0.8
10237	Xylene (Total)	1330-20-7	N.D.		5	1	0.8
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	5	J	23	4	1
10727	Benzo(a)anthracene	56-55-3	19	J	23	4	1
10727	Benzo(a)pyrene	50-32-8	19	J	23	4	1
10727	Benzo(b)fluoranthene	205-99-2	33		23	4	1
10727	Benzo(g,h,i)perylene	191-24-2	15	J	23	4	1
10727	Chrysene	218-01-9	25		23	4	1
10727	Fluorene	86-73-7	N.D.		23	4	1
10727	Naphthalene	91-20-3	6	J	23	4	1
10727	Phenanthrene	85-01-8	16	J	23	4	1
10727	Pyrene	129-00-0	33		23	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	7.22		1.42	0.484	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.7		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161051AA	04/14/2016 13:35	Jennifer K Howe	0.8
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 14:10	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 14:10	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-039-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329547
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 14:10 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1639 SDG#: MHF28-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 14:10	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016 01:22	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	2	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 07:12	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-012-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329548
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 14:42 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1612 SDG#: MHF28-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	230	23	41.32
10237	1,2-Dibromoethane	106-93-4	N.D.	230	45	41.32
10237	1,2-Dichloroethane	107-06-2	N.D.	230	45	41.32
10237	Ethylbenzene	100-41-4	N.D.	230	45	41.32
10237	Isopropylbenzene	98-82-8	250	230	45	41.32
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	230	23	41.32
10237	Toluene	108-88-3	N.D.	230	45	41.32
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	230	45	41.32
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	230	45	41.32
10237	Xylene (Total)	1330-20-7	47 J	230	45	41.32
	Reporting limits were raised due to interference from the sample matrix.					
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	690	180	36	10
10727	Benzo(a)anthracene	56-55-3	1,900	180	36	10
10727	Benzo(a)pyrene	50-32-8	1,800	180	36	10
10727	Benzo(b)fluoranthene	205-99-2	2,300	180	36	10
10727	Benzo(g,h,i)perylene	191-24-2	1,400	180	36	10
10727	Chrysene	218-01-9	1,800	180	36	10
10727	Fluorene	86-73-7	330	180	36	10
10727	Naphthalene	91-20-3	440	180	36	10
10727	Phenanthrene	85-01-8	2,000	180	36	10
10727	Pyrene	129-00-0	3,300	180	36	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	194	1.20	0.408	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	8.2	0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 09:35	Anita M Dale	41.32
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 14:42	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-012-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329548
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 14:42 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1612 SDG#: MHF28-12

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 14:42	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 14:42	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 21:43	Catherine E Bachman	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 07:22	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-012-0-2-Soil-B Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329549
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 14:53 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B16FD SDG#: MHF28-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	250	25	40.65
10237	1,2-Dibromoethane	106-93-4	N.D.	250	51	40.65
10237	1,2-Dichloroethane	107-06-2	N.D.	250	51	40.65
10237	Ethylbenzene	100-41-4	N.D.	250	51	40.65
10237	Isopropylbenzene	98-82-8	2,000	250	51	40.65
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	250	25	40.65
10237	Toluene	108-88-3	N.D.	250	51	40.65
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	250	51	40.65
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	250	51	40.65
10237	Xylene (Total)	1330-20-7	61 J	250	51	40.65
	Reporting limits were raised due to interference from the sample matrix.					
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,300	210	41	10
10727	Benzo(a)anthracene	56-55-3	940	210	41	10
10727	Benzo(a)pyrene	50-32-8	890	210	41	10
10727	Benzo(b)fluoranthene	205-99-2	1,600	210	41	10
10727	Benzo(g,h,i)perylene	191-24-2	740	210	41	10
10727	Chrysene	218-01-9	2,700	210	41	10
10727	Fluorene	86-73-7	66,000	420	83	20
10727	Naphthalene	91-20-3	1,300	210	41	10
10727	Phenanthrene	85-01-8	20,000	210	41	10
10727	Pyrene	129-00-0	1,800	210	41	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	141	1.74	0.590	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	20.0	0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161072AA	04/16/2016 09:58	Anita M Dale	40.65
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 14:53	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-012-0-2-Soil-B Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329549
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 14:53 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B16FD SDG#: MHF28-13

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 14:53	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 14:53	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 05:56	William H Saadeh	10
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 23:52	Catherine E Bachman	20
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 07:26	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-013-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329550
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 15:18 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1613 SDG#: MHF28-14

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	230	23	39.06
10237	1,2-Dibromoethane	106-93-4	N.D.	230	46	39.06
10237	1,2-Dichloroethane	107-06-2	N.D.	230	46	39.06
10237	Ethylbenzene	100-41-4	N.D.	230	46	39.06
10237	Isopropylbenzene	98-82-8	N.D.	230	46	39.06
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	230	23	39.06
10237	Toluene	108-88-3	N.D.	230	46	39.06
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	230	46	39.06
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	230	46	39.06
10237	Xylene (Total)	1330-20-7	N.D.	230	46	39.06
	Reporting limits were raised due to interference from the sample matrix.					
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	400	200	39	10
10727	Benzo(a)anthracene	56-55-3	460	200	39	10
10727	Benzo(a)pyrene	50-32-8	280	200	39	10
10727	Benzo(b)fluoranthene	205-99-2	340	200	39	10
10727	Benzo(g,h,i)perylene	191-24-2	210	200	39	10
10727	Chrysene	218-01-9	1,600	200	39	10
10727	Fluorene	86-73-7	2,500	200	39	10
10727	Naphthalene	91-20-3	N.D.	200	39	10
10727	Phenanthrene	85-01-8	960	200	39	10
10727	Pyrene	129-00-0	810	200	39	10
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	32.0	1.56	0.530	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	14.8	0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161091AA	04/18/2016 14:12	Anita M Dale	39.06
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610340805	04/11/2016 15:18	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-013-0-2-Soil Grab Soil
Marcus Hook Facility AOI7

LL Sample # SW 8329550
LL Group # 1649742
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/11/2016 15:18 by MM

Submitted: 04/12/2016 14:36
Reported: 07/22/2016 13:21

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B1613 SDG#: MHF28-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610340805	04/11/2016 15:18	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610340805	04/11/2016 15:18	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16110SLD026	04/21/2016 06:18	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16110SLD026	04/20/2016 00:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161095708003	04/20/2016 07:29	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161095708003	04/19/2016 06:05	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16104820005B	04/13/2016 18:29	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: Q161091AA	Sample number(s): 8329550		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: R161072AA	Sample number(s): 8329546,8329548-8329549		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: X161042AA	Sample number(s): 8329537-8329538,8329540,8329542-8329543		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: X161051AA	Sample number(s): 8329541,8329544-8329545,8329547		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: 16110SLD026	Sample number(s): 8329537-8329538,8329540-8329544,8329546,8329548-8329550		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3
Batch number: 16114SLA026	Sample number(s): 8329545,8329547		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3
	mg/kg	mg/kg	mg/kg
Batch number: 161095708003	Sample number(s): 8329537-8329538,8329540-8329550		
Lead	N.D.	1.50	0.510

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Q161091AA	Sample number(s): 8329550								
Benzene	1000	982.23	1000	958.11	98	96	80-120	2	30
1,2-Dibromoethane	1000	993.92	1000	987.71	99	99	80-120	1	30
1,2-Dichloroethane	1000	873.42	1000	920.71	87	92	77-130	5	30
Ethylbenzene	1000	961.31	1000	928.79	96	93	80-120	3	30
Isopropylbenzene	1000	974.22	1000	946.46	97	95	70-120	3	30
Methyl Tertiary Butyl Ether	1000	879.04	1000	947.92	88	95	72-120	8	30
Toluene	1000	994.43	1000	964.51	99	96	80-120	3	30
1,2,4-Trimethylbenzene	1000	973.12	1000	940.64	97	94	74-120	3	30
1,3,5-Trimethylbenzene	1000	984.58	1000	938.2	98	94	73-120	5	30
Xylene (Total)	3000	3028.56	3000	2957.64	101	99	80-120	2	30
Batch number: R161072AA	Sample number(s): 8329546,8329548-8329549								

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzene	1000	1014.84	1000	1038.9	101	104	80-120	2	30
1,2-Dibromoethane	1000	917.66	1000	933.68	92	93	80-120	2	30
1,2-Dichloroethane	1000	1021.41	1000	1022.09	102	102	77-130	0	30
Ethylbenzene	1000	921.28	1000	929.61	92	93	80-120	1	30
Isopropylbenzene	1000	931.71	1000	927.21	93	93	70-120	0	30
Methyl Tertiary Butyl Ether	1000	995.54	1000	1004	100	100	72-120	1	30
Toluene	1000	923.91	1000	942.96	92	94	80-120	2	30
1,2,4-Trimethylbenzene	1000	887.01	1000	896.75	89	90	74-120	1	30
1,3,5-Trimethylbenzene	1000	906.87	1000	902.62	91	90	73-120	0	30
Xylene (Total)	3000	2778.71	3000	2810.76	93	94	80-120	1	30
Batch number: X161042AA	Sample number(s): 8329537-8329538,8329540,8329542-8329543								
Benzene	20	21.38	20	21.19	107	106	80-120	1	30
1,2-Dibromoethane	20	18.53	20	18.59	93	93	80-120	0	30
1,2-Dichloroethane	20	22.29	20	22	111	110	77-130	1	30
Ethylbenzene	20	19.78	20	19.93	99	100	80-120	1	30
Isopropylbenzene	20	18.77	20	18.95	94	95	70-120	1	30
Methyl Tertiary Butyl Ether	20	18.85	20	18.78	94	94	72-120	0	30
Toluene	20	20.01	20	20.15	100	101	80-120	1	30
1,2,4-Trimethylbenzene	20	18.5	20	18.55	92	93	74-120	0	30
1,3,5-Trimethylbenzene	20	18.38	20	18.44	92	92	73-120	0	30
Xylene (Total)	60	56.77	60	56.97	95	95	80-120	0	30
Batch number: X161051AA	Sample number(s): 8329541,8329544-8329545,8329547								
Benzene	20	21.82	20	21.08	109	105	80-120	3	30
1,2-Dibromoethane	20	18.79	20	18.67	94	93	80-120	1	30
1,2-Dichloroethane	20	22.23	20	22.05	111	110	77-130	1	30
Ethylbenzene	20	20.49	20	19.77	102	99	80-120	4	30
Isopropylbenzene	20	19.38	20	18.68	97	93	70-120	4	30
Methyl Tertiary Butyl Ether	20	19.38	20	19.12	97	96	72-120	1	30
Toluene	20	20.53	20	19.85	103	99	80-120	3	30
1,2,4-Trimethylbenzene	20	18.95	20	18.33	95	92	74-120	3	30
1,3,5-Trimethylbenzene	20	18.92	20	18.2	95	91	73-120	4	30
Xylene (Total)	60	58.02	60	56.36	97	94	80-120	3	30

	ug/kg	ug/kg	ug/kg	ug/kg		
Batch number: 16110SLD026	Sample number(s): 8329537-8329538,8329540-8329544,8329546,8329548-8329550					
Anthracene	1666.67	1617.02			97	82-118
Benzo(a)anthracene	1666.67	1671			100	76-119
Benzo(a)pyrene	1666.67	1571.05			94	85-117
Benzo(b)fluoranthene	1666.67	1616.27			97	78-129
Benzo(g,h,i)perylene	1666.67	1477.82			89	77-118
Chrysene	1666.67	1684.24			101	80-121
Fluorene	1666.67	1634.24			98	86-118
Naphthalene	1666.67	1619.8			97	82-112
Phenanthrene	1666.67	1550.66			93	80-114
Pyrene	1666.67	1567.08			94	81-114
Batch number: 16114SLA026	Sample number(s): 8329545,8329547					
Anthracene	1666.67	1544.2			93	82-118
Benzo(a)anthracene	1666.67	1420.71			85	76-119

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(a)pyrene	1666.67	1607.76			96		85-117		
Benzo(b)fluoranthene	1666.67	1484.78			89		78-129		
Benzo(g,h,i)perylene	1666.67	1572.42			94		77-118		
Chrysene	1666.67	1466.17			88		80-121		
Fluorene	1666.67	1501.04			90		86-118		
Naphthalene	1666.67	1597.79			96		82-112		
Phenanthrene	1666.67	1478.83			89		80-114		
Pyrene	1666.67	1446.73			87		81-114		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161095708003	Sample number(s): 8329537-8329538,8329540-8329550								
Lead	15	14.16			94		80-120		
	%	%	%	%					
Batch number: 16104820005B	Sample number(s): 8329537-8329538,8329540-8329550								
Moisture	89.5	89.43			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16110SLD026	Sample number(s): 8329537-8329538,8329540-8329544,8329546,8329548-8329550 UNSPK: 8329548									
Anthracene	632.66	1662.23	2453.5	1651.8	1845.56	110	73*	82-118	28	30
Benzo(a)anthracene	1718.84	1662.23	5290.17	1651.8	3058.67	215*	81	76-119	53*	30
Benzo(a)pyrene	1670.51	1662.23	4998.08	1651.8	3014.37	200*	81*	85-117	50*	30
Benzo(b)fluoranthene	2113.22	1662.23	5335.56	1651.8	2973.35	194*	52*	78-129	57*	30
Benzo(g,h,i)perylene	1312.36	1662.23	4145.58	1651.8	2674.73	170*	82	77-118	43*	30
Chrysene	1696.26	1662.23	5024.96	1651.8	3033.56	200*	81	80-121	49*	30
Fluorene	304.6	1662.23	1826.73	1651.8	1566.87	92	76*	86-118	15	30
Naphthalene	407.78	1662.23	2123.83	1651.8	1734.45	103	80*	82-112	20	30
Phenanthrene	1829.92	1662.23	4521.97	1651.8	3044.4	162*	74*	80-114	39*	30
Pyrene	3071.64	1662.23	7655.44	1651.8	4469.21	276*	85	81-114	53*	30
Batch number: 16114SLA026	Sample number(s): 8329545,8329547 UNSPK: P336850									
Anthracene	12.96	1647.45	1565.18	1650.71	1436.81	94	86	82-118	9	30
Benzo(a)anthracene	12.39	1647.45	1368.72	1650.71	1278.37	82	77	76-119	7	30
Benzo(a)pyrene	10.83	1647.45	1569.27	1650.71	1451.61	95	87	85-117	8	30
Benzo(b)fluoranthene	17.4	1647.45	1584.72	1650.71	1309.31	95	78	78-129	19	30
Benzo(g,h,i)perylene	7.31	1647.45	1606.08	1650.71	1477.95	97	89	77-118	8	30
Chrysene	17.95	1647.45	1452.29	1650.71	1342.43	87	80	80-121	8	30
Fluorene	43.02	1647.45	1495.02	1650.71	1391.08	88	82*	86-118	7	30
Naphthalene	57.02	1647.45	1590.88	1650.71	1492.78	93	87	82-112	6	30
Phenanthrene	53.53	1647.45	1522.21	1650.71	1409.77	89	82	80-114	8	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Pyrene	30.23	1647.45	1462.8	1650.71	1377.8	87	82	81-114	6	30
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161095708003	Sample number(s): 8329537-8329538,8329540-8329550 UNSPK: P336385									
Lead	26.94	13.27	59.96	11.63	39.31	249*	106	75-125	42*	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161095708003	Sample number(s): 8329537-8329538,8329540-8329550 BKG: P336385			
Lead	26.94	32.68	19	20
	%	%		
Batch number: 16104820005B	Sample number(s): 8329537-8329538,8329540-8329550 BKG: P327946			
Moisture	N.D.	N.D.	0 (1)	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- Solid by 8260B
Batch number: Q161091AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8329550	80	80	68	77
Blank	104	106	96	91
LCS	96	94	93	91
LCSD	99	101	92	90
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: R161072AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8329546	61	61	44*	46*
8329548	76	76	67	65
8329549	77	78	63	78
Blank	96	98	84	80
LCS	97	94	84	82

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
LCSD	101	96	87	83
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161042AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8329537	100	102	110	82
8329538	102	104	100	96
8329540	100	100	99	97
8329542	99	103	100	101
8329543	97	101	107	86
Blank	102	99	100	97
LCS	100	99	102	100
LCSD	100	97	101	100
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161051AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8329541	97	100	100	97
8329544	96	101	97	98
8329545	100	100	103	88
8329547	102	105	97	97
Blank	102	100	100	97
LCS	100	97	101	100
LCSD	100	98	101	101
Limits:	50-141	54-135	52-141	50-131

Analysis Name: TCL 8270 (microwave)
Batch number: 16110SLD026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8329537	89	90	35	49*	80	80
8329538	93	97	40	80	89	91
8329540	96	96	71	85	89	91
8329541	91	93	55	83	85	90
8329542	92	96	72	84	88	91
8329543	82	86	70	76	79	82
8329544	90	92	66	86	87	93
8329546	77	79	50	99	67	76
8329548	86	87	73	83	83	81
8329549	67	70	53	83	65	65
8329550	76	80	68	91	76	78
Blank	100	103	101	90	89	90
LCS	101	101	94	90	88	89
MS	81	84	66	81	80	81
MSD	71	73	60	68	68	69

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 07/22/2016 13:21

Group Number: 1649742

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Limits:	58-122	57-126	35-136	54-123	63-117	59-129

Analysis Name: TCL 8270 (microwave)
Batch number: 16114SLA026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8329545	83	88	48	96	82	95
8329547	85	58	41	96	81	95
Blank	85	92	73	98	86	102
LCS	93	100	70	96	85	94
MS	87	93	67	96	84	97
MSD	82	90	61	91	78	91
Limits:	58-122	57-126	35-136	54-123	63-117	59-129

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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Acct. # 10177 Group # 1649742 Sample # 8329537-50

COC # 496126

Client Information

Client: Evergreen 10177	Acct. #:
Project Name/#: Evergreen / 11109613.01	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Matt Morcus	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Sediment ☐ Soil ☒ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC: ____
SCR#: ____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	VOCs	Moisture, Lead, select VOCs	Remarks
AOI6-BH16-007-0-2-soil	4/8/16	1409	X		X			5	4	1	1 of
AOI6-BH16-007-2-4-Soil	↓	1438	X		X			5	4	1	
TB-AOI6-04/08/16-003	↓	1440	X		~~X~~ AC			3			trip Blanks
AOI6-BH16-008-0-2-Soil	↓	1458	X		X			5	4	1	
AOI6-BH16-008-2-4-Soil	↓	1519	X		X			5	4	1	
AOI6-BH16-009-0-2-Soil	↓	1554	X		X						
~~AOI6-BH16-009-2-4-Soil~~ AC											No Sample
AOI6-BH16-018-0-2-Soil	4/11/16	1107	X		X			5	4	1	
AOI6-BH16-017-0-2-Soil	↓	1143	X		X			5	4	1	
AOI6-BH16-010-0-2-Soil	↓	1340	X		X			5	4	1	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	4/11/16		[signature]	4-12-16	1304
[signature]	4-12-16	14:36			
			[signature]	4-12-16	1436

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.6 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 1115

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1649742 Sample # 8329537-50

COC # 496125

Client Information

Client: Evergreen 10177	Acct. #:
Project Name/#: Evergreen /11109613.01	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Alissa Cannon	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Soil ☒ Sediment ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC: ____
SCR#: ____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	VOCs	Moisture, lead, select VOCs	Remarks
AOI6-BH16-011-0-2-soil	4/11/16	1353	X					5	4	1	
AOI6-BH16-039-0-2-soil	↓	1410	X					5	4	1	
AOI6-BH16-012-0-2-soil	↓	1442	X					5	4	1	
AOI6-BH16-012-0-2-soil-B	↓	1453	X					5	4	1	
AOI6-BH16-013-0-2-soil	↓	1518	X					5	4	1	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	4/11/16		[signature]	4/12/16	1304
[signature]	4-12-16	1436			
			[signature]	4-12-16	1476

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.6 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

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Sample Administration Receipt Documentation Log

Doc Log ID: 142561

Group Number(s): 1649742

Client: GHD

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	04/12/2016 14:36
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	No	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	3
Samples Intact:	Yes	Trip Blank Type:	See Below
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Trip Blank Type(s): 1 MeOH, 2 Sodium Biosulfate

Unpacked by Timothy Cubberley (6520) at 14:59 on 04/12/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.6	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T : 717-656-2300
F : 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: June 29, 2016

Project: Philadelphia Refinery

Submittal Date: 04/15/2016
Group Number: 1651423
SDG: MHF29
PO Number: 34004491
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-BH16-002-0-2-soil Grab Soil	8336823
AOI6-BH16-005-0-2-soil Grab Soil	8336824
AOI6-BH16-003-0-2-soil Grab Soil	8336825
AOI6-BH16-001-0-2-soil Grab Soil	8336826
AOI6-BH16-029-0-2-soil Grab Soil	8336827
AOI6-BH16-029-2-4-soil Grab Soil	8336828
AOI6-BH16-028-0-2-soil Grab Soil	8336829
AOI6-BH16-027-0-2-soil Grab Soil	8336830
AOI6-BH16-027-2-4-soil Grab Soil	8336831
AOI6-BH16-035-0-2-soil Grab Soil	8336832
AOI6-BH16-035-2-4-soil Grab Soil	8336833
AOI6-BH16-034-0-2-soil Grab Soil	8336834
AOI6-BH16-034-2-4-soil Grab Soil	8336835
AOI6-BH16-033-0-2-soil Grab Soil	8336836
AOI6-BH16-033-2-4-soil Grab Soil	8336837
AOI6-BH16-032-0-2-soil Grab Soil	8336838
AOI6-BH16-032-2-4-soil Grab Soil	8336839
TB-AOI6-4-13-16 Methanol	8336840
AOI6-BH16-036-0-2-soil Grab Soil	8336841
AOI6-BH16-036-2-4-soil Grab Soil	8336842
AOI6-BH16-037-0-2-soil Grab Soil	8336843
AOI6-BH16-037-2-4-soil Grab Soil	8336844
AOI6-BH16-038-0-2-soil Grab Soil	8336845
TB-AOI6-04-14-16 Methanol	8336846
AOI6-BH16-030-0-2-soil Grab Soil	8336847
AOI6-BH16-030-2-4-soil Grab Soil	8336848
AOI6-BH16-031-0-2-soil Grab Soil	8336849
AOI6-BH16-031-2-4-soil Grab Soil	8336850

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-BH16-002-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336823
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 09:31 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2901 SDG#: MHF29-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1	J	5	0.5	0.69
10237	1,2-Dibromoethane	106-93-4	N.D.		5	0.9	0.69
10237	1,2-Dichloroethane	107-06-2	N.D.		5	0.9	0.69
10237	Ethylbenzene	100-41-4	N.D.		5	0.9	0.69
10237	Isopropylbenzene	98-82-8	N.D.		5	0.9	0.69
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.69
10237	Toluene	108-88-3	1	J	5	0.9	0.69
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5	0.9	0.69
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	0.9	0.69
10237	Xylene (Total)	1330-20-7	N.D.		5	0.9	0.69

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	340		110	22	5
10727	Benzo(a)anthracene	56-55-3	1,700		110	22	5
10727	Benzo(a)pyrene	50-32-8	1,700		110	22	5
10727	Benzo(b)fluoranthene	205-99-2	2,200		110	22	5
10727	Benzo(g,h,i)perylene	191-24-2	850		110	22	5
10727	Chrysene	218-01-9	1,700		110	22	5
10727	Fluorene	86-73-7	79	J	110	22	5
10727	Naphthalene	91-20-3	630		110	22	5
10727	Phenanthrene	85-01-8	870		110	22	5
10727	Pyrene	129-00-0	2,000		110	22	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	180		1.40	0.478	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.8		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-002-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336823
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 09:31 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2901 SDG#: MHF29-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 12:38	Jennifer K Howe	0.69
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/12/2016 09:31	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/12/2016 09:31	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/12/2016 09:31	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 10:57	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:20	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-005-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336824
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 10:13 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2902 SDG#: MHF29-02

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	0.4	J	4	0.4	0.68
10237	1,2-Dibromoethane	106-93-4	N.D.		4	0.7	0.68
10237	1,2-Dichloroethane	107-06-2	N.D.		4	0.7	0.68
10237	Ethylbenzene	100-41-4	N.D.		4	0.7	0.68
10237	Isopropylbenzene	98-82-8	N.D.		4	0.7	0.68
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4	0.4	0.68
10237	Toluene	108-88-3	N.D.		4	0.7	0.68
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4	0.7	0.68
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4	0.7	0.68
10237	Xylene (Total)	1330-20-7	N.D.		4	0.7	0.68
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	16	J	18	3	1
10727	Benzo(a)anthracene	56-55-3	110		18	3	1
10727	Benzo(a)pyrene	50-32-8	130		18	3	1
10727	Benzo(b)fluoranthene	205-99-2	180		18	3	1
10727	Benzo(g,h,i)perylene	191-24-2	150		18	3	1
10727	Chrysene	218-01-9	120		18	3	1
10727	Fluorene	86-73-7	5	J	18	3	1
10727	Naphthalene	91-20-3	25		18	3	1
10727	Phenanthrene	85-01-8	53		18	3	1
10727	Pyrene	129-00-0	150		18	3	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	68.7		1.05	0.358	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	4.9		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 13:01	Jennifer K Howe	0.68
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/12/2016 10:13	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/12/2016 10:13	Client Supplied	1

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Analysis Report

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Sample Description: AOI6-BH16-005-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336824
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 10:13 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2902 SDG#: MHF29-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/12/2016 10:13	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/25/2016 23:15	William H Saadeh	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:23	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-003-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336825
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 11:43 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
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Suite #3
Niagara Falls NY 14304

M2903 SDG#: MHF29-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	5	0.5	0.81
10237	1,2-Dibromoethane	106-93-4	N.D.	5	0.9	0.81
10237	1,2-Dichloroethane	107-06-2	N.D.	5	0.9	0.81
10237	Ethylbenzene	100-41-4	N.D.	5	0.9	0.81
10237	Isopropylbenzene	98-82-8	N.D.	5	0.9	0.81
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	0.81
10237	Toluene	108-88-3	N.D.	5	0.9	0.81
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	0.9	0.81
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	0.9	0.81
10237	Xylene (Total)	1330-20-7	N.D.	5	0.9	0.81

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	410	19	4	1
10727	Benzo(a)anthracene	56-55-3	1,900	19	4	1
10727	Benzo(a)pyrene	50-32-8	1,900	19	4	1
10727	Benzo(b)fluoranthene	205-99-2	2,600	19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	1,500	19	4	1
10727	Chrysene	218-01-9	1,900	19	4	1
10727	Fluorene	86-73-7	110	19	4	1
10727	Naphthalene	91-20-3	510	19	4	1
10727	Phenanthrene	85-01-8	1,700	19	4	1
10727	Pyrene	129-00-0	2,800	19	4	1
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	549	1.63	0.553	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	12.2	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-003-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336825
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 11:43 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2903 SDG#: MHF29-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 13:24	Jennifer K Howe	0.81
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/12/2016 11:43	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/12/2016 11:43	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/12/2016 11:43	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 11:39	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:34	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-001-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336826
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 13:54 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2904 SDG#: MHF29-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2	J	6	0.6	0.95
10237	1,2-Dibromoethane	106-93-4	N.D.		6	1	0.95
10237	1,2-Dichloroethane	107-06-2	N.D.		6	1	0.95
10237	Ethylbenzene	100-41-4	N.D.		6	1	0.95
10237	Isopropylbenzene	98-82-8	N.D.		6	1	0.95
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		6	0.6	0.95
10237	Toluene	108-88-3	3	J	6	1	0.95
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		6	1	0.95
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		6	1	0.95
10237	Xylene (Total)	1330-20-7	1	J	6	1	0.95

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	730		100	19	5
10727	Benzo(a)anthracene	56-55-3	950		100	19	5
10727	Benzo(a)pyrene	50-32-8	1,100		100	19	5
10727	Benzo(b)fluoranthene	205-99-2	1,500		100	19	5
10727	Benzo(g,h,i)perylene	191-24-2	1,300		100	19	5
10727	Chrysene	218-01-9	1,100		100	19	5
10727	Fluorene	86-73-7	320		100	19	5
10727	Naphthalene	91-20-3	6,900		100	19	5
10727	Phenanthrene	85-01-8	2,000		100	19	5
10727	Pyrene	129-00-0	1,600		100	19	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	288		1.24	0.421	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	14.6		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-001-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336826
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/12/2016 13:54 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2904 SDG#: MHF29-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 13:48	Jennifer K Howe	0.95
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/12/2016 13:54	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/12/2016 13:54	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/12/2016 13:54	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 11:59	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:37	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-029-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336827
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 09:05 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2905 SDG#: MHF29-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	990		250	25	44.74
10237	1,2-Dibromoethane	106-93-4	N.D.		250	51	44.74
10237	1,2-Dichloroethane	107-06-2	N.D.		250	51	44.74
10237	Ethylbenzene	100-41-4	300		250	51	44.74
10237	Isopropylbenzene	98-82-8	1,700		250	51	44.74
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		250	25	44.74
10237	Toluene	108-88-3	370		250	51	44.74
10237	1,2,4-Trimethylbenzene	95-63-6	250	J	250	51	44.74
10237	1,3,5-Trimethylbenzene	108-67-8	95	J	250	51	44.74
10237	Xylene (Total)	1330-20-7	600		250	51	44.74
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,900		95	19	5
10727	Benzo(a)anthracene	56-55-3	6,100		95	19	5
10727	Benzo(a)pyrene	50-32-8	6,200		95	19	5
10727	Benzo(b)fluoranthene	205-99-2	8,700		95	19	5
10727	Benzo(g,h,i)perylene	191-24-2	4,500		95	19	5
10727	Chrysene	218-01-9	6,100		95	19	5
10727	Fluorene	86-73-7	3,200		95	19	5
10727	Naphthalene	91-20-3	3,100		95	19	5
10727	Phenanthrene	85-01-8	11,000		95	19	5
10727	Pyrene	129-00-0	11,000		95	19	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	138		1.15	0.392	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	12.0		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 09:58	Anita M Dale	44.74
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 09:05	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 09:05	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-029-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336827
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 09:05 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2905 SDG#: MHF29-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 09:05	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 12:20	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:41	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-029-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336828
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 09:27 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2906 SDG#: MHF29-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	4,500	280	28	50.32
10237	1,2-Dibromoethane	106-93-4	N.D.	280	56	50.32
10237	1,2-Dichloroethane	107-06-2	N.D.	280	56	50.32
10237	Ethylbenzene	100-41-4	810	280	56	50.32
10237	Isopropylbenzene	98-82-8	10,000	280	56	50.32
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	280	28	50.32
10237	Toluene	108-88-3	1,200	280	56	50.32
10237	1,2,4-Trimethylbenzene	95-63-6	1,000	280	56	50.32
10237	1,3,5-Trimethylbenzene	108-67-8	480	280	56	50.32
10237	Xylene (Total)	1330-20-7	1,500	280	56	50.32
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,200	95	19	5
10727	Benzo(a)anthracene	56-55-3	2,800	95	19	5
10727	Benzo(a)pyrene	50-32-8	2,600	95	19	5
10727	Benzo(b)fluoranthene	205-99-2	3,500	95	19	5
10727	Benzo(g,h,i)perylene	191-24-2	1,700	95	19	5
10727	Chrysene	218-01-9	3,300	95	19	5
10727	Fluorene	86-73-7	8,400	95	19	5
10727	Naphthalene	91-20-3	4,800	95	19	5
10727	Phenanthrene	85-01-8	10,000	95	19	5
10727	Pyrene	129-00-0	5,800	95	19	5
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	137	1.26	0.428	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	10.5	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 13:29	Anita M Dale	50.32
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 09:27	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 09:27	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-029-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336828
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 09:27 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2906 SDG#: MHF29-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 09:27	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 12:41	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:45	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-028-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336829
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 10:24 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2907 SDG#: MHF29-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	460		260	26	47.21
10237	1,2-Dibromoethane	106-93-4	N.D.		260	52	47.21
10237	1,2-Dichloroethane	107-06-2	N.D.		260	52	47.21
10237	Ethylbenzene	100-41-4	100	J	260	52	47.21
10237	Isopropylbenzene	98-82-8	220	J	260	52	47.21
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		260	26	47.21
10237	Toluene	108-88-3	450		260	52	47.21
10237	1,2,4-Trimethylbenzene	95-63-6	57	J	260	52	47.21
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		260	52	47.21
10237	Xylene (Total)	1330-20-7	340		260	52	47.21
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	390		92	18	5
10727	Benzo(a)anthracene	56-55-3	910		92	18	5
10727	Benzo(a)pyrene	50-32-8	1,200		92	18	5
10727	Benzo(b)fluoranthene	205-99-2	1,600		92	18	5
10727	Benzo(g,h,i)perylene	191-24-2	1,100		92	18	5
10727	Chrysene	218-01-9	1,000		92	18	5
10727	Fluorene	86-73-7	160		92	18	5
10727	Naphthalene	91-20-3	1,200		92	18	5
10727	Phenanthrene	85-01-8	1,100		92	18	5
10727	Pyrene	129-00-0	1,200		92	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	159		1.11	0.377	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 10:22	Anita M Dale	47.21
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 10:24	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-028-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336829
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 10:24 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2907 SDG#: MHF29-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 10:24	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 10:24	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 13:02	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:49	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-027-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336830
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 10:40 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2908 SDG#: MHF29-08

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		5	0.5	0.72
10237	1,2-Dibromoethane	106-93-4	N.D.		5	1	0.72
10237	1,2-Dichloroethane	107-06-2	N.D.		5	1	0.72
10237	Ethylbenzene	100-41-4	N.D.		5	1	0.72
10237	Isopropylbenzene	98-82-8	N.D.		5	1	0.72
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.72
10237	Toluene	108-88-3	N.D.		5	1	0.72
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5	1	0.72
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	1	0.72
10237	Xylene (Total)	1330-20-7	N.D.		5	1	0.72
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	7	J	22	4	1
10727	Benzo(a)anthracene	56-55-3	11	J	22	4	1
10727	Benzo(a)pyrene	50-32-8	10	J	22	4	1
10727	Benzo(b)fluoranthene	205-99-2	16	J	22	4	1
10727	Benzo(g,h,i)perylene	191-24-2	9	J	22	4	1
10727	Chrysene	218-01-9	21	J	22	4	1
10727	Fluorene	86-73-7	9	J	22	4	1
10727	Naphthalene	91-20-3	10	J	22	4	1
10727	Phenanthrene	85-01-8	20	J	22	4	1
10727	Pyrene	129-00-0	32		22	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	20.0		1.63	0.556	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.8		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 14:11	Jennifer K Howe	0.72
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 10:40	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 10:40	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-027-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336830
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 10:40 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2908 SDG#: MHF29-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 10:40	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 13:23	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:52	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-027-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336831
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 10:53 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2909 SDG#: MHF29-09

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2,500	J	5,300	530	902.86
10237	1,2-Dibromoethane	106-93-4	N.D.		5,300	1,100	902.86
10237	1,2-Dichloroethane	107-06-2	N.D.		5,300	1,100	902.86
10237	Ethylbenzene	100-41-4	N.D.		5,300	1,100	902.86
10237	Isopropylbenzene	98-82-8	360,000		53,000	11,000	9028.61
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5,300	530	902.86
10237	Toluene	108-88-3	3,900	J	5,300	1,100	902.86
10237	1,2,4-Trimethylbenzene	95-63-6	10,000		5,300	1,100	902.86
10237	1,3,5-Trimethylbenzene	108-67-8	9,300		5,300	1,100	902.86
10237	Xylene (Total)	1330-20-7	3,300	J	5,300	1,100	902.86
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	3,400		100	20	5
10727	Benzo(a)anthracene	56-55-3	2,300		100	20	5
10727	Benzo(a)pyrene	50-32-8	1,700		100	20	5
10727	Benzo(b)fluoranthene	205-99-2	1,700		100	20	5
10727	Benzo(g,h,i)perylene	191-24-2	1,000		100	20	5
10727	Chrysene	218-01-9	4,000		100	20	5
10727	Fluorene	86-73-7	6,300		100	20	5
10727	Naphthalene	91-20-3	7,800		100	20	5
10727	Phenanthrene	85-01-8	13,000		100	20	5
10727	Pyrene	129-00-0	6,200		100	20	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	90.6		1.43	0.488	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	15.0		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 12:19	Anita M Dale	902.86
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 16:59	Anita M Dale	9028.61
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 10:53	Client Supplied	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-027-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336831
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 10:53 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2909 SDG#: MHF29-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 10:53	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 10:53	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 13:44	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:56	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-035-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336832
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 11:27 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Niagara Falls NY 14304

M2910 SDG#: MHF29-10

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1	J	4	0.4	0.72
10237	1,2-Dibromoethane	106-93-4	N.D.		4	0.8	0.72
10237	1,2-Dichloroethane	107-06-2	N.D.		4	0.8	0.72
10237	Ethylbenzene	100-41-4	N.D.		4	0.8	0.72
10237	Isopropylbenzene	98-82-8	21		4	0.8	0.72
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4	0.4	0.72
10237	Toluene	108-88-3	N.D.		4	0.8	0.72
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4	0.8	0.72
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4	0.8	0.72
10237	Xylene (Total)	1330-20-7	N.D.		4	0.8	0.72
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	N.D.		19	4	1
10727	Benzo(a)anthracene	56-55-3	8	J	19	4	1
10727	Benzo(a)pyrene	50-32-8	9	J	19	4	1
10727	Benzo(b)fluoranthene	205-99-2	14	J	19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	10	J	19	4	1
10727	Chrysene	218-01-9	10	J	19	4	1
10727	Fluorene	86-73-7	N.D.		19	4	1
10727	Naphthalene	91-20-3	N.D.		19	4	1
10727	Phenanthrene	85-01-8	10	J	19	4	1
10727	Pyrene	129-00-0	15	J	19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	10.0		1.66	0.565	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	10.7		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 14:34	Jennifer K Howe	0.72
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 11:27	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 11:27	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-035-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336832
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 11:27 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2910 SDG#: MHF29-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 11:27	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 14:05	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 09:59	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-035-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336833
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 11:35 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Niagara Falls NY 14304

M2911 SDG#: MHF29-11

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2	J	4	0.4	0.73
10237	1,2-Dibromoethane	106-93-4	N.D.		4	0.8	0.73
10237	1,2-Dichloroethane	107-06-2	N.D.		4	0.8	0.73
10237	Ethylbenzene	100-41-4	N.D.		4	0.8	0.73
10237	Isopropylbenzene	98-82-8	83		4	0.8	0.73
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4	0.4	0.73
10237	Toluene	108-88-3	N.D.		4	0.8	0.73
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4	0.8	0.73
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4	0.8	0.73
10237	Xylene (Total)	1330-20-7	N.D.		4	0.8	0.73
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	4	J	19	4	1
10727	Benzo(a)anthracene	56-55-3	15	J	19	4	1
10727	Benzo(a)pyrene	50-32-8	20		19	4	1
10727	Benzo(b)fluoranthene	205-99-2	22		19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	24		19	4	1
10727	Chrysene	218-01-9	20		19	4	1
10727	Fluorene	86-73-7	N.D.		19	4	1
10727	Naphthalene	91-20-3	N.D.		19	4	1
10727	Phenanthrene	85-01-8	14	J	19	4	1
10727	Pyrene	129-00-0	26		19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	10.9		1.56	0.531	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.4		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 14:57	Jennifer K Howe	0.73
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 11:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 11:35	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-035-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336833
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 11:35 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2911 SDG#: MHF29-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 11:35	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 14:26	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:03	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-034-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336834
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 13:19 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2912 SDG#: MHF29-12

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	44,000		5,000	500	868.78
10237	1,2-Dibromoethane	106-93-4	N.D.		5,000	1,000	868.78
10237	1,2-Dichloroethane	107-06-2	N.D.		5,000	1,000	868.78
10237	Ethylbenzene	100-41-4	N.D.		5,000	1,000	868.78
10237	Isopropylbenzene	98-82-8	230,000		5,000	1,000	868.78
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5,000	500	868.78
10237	Toluene	108-88-3	38,000		5,000	1,000	868.78
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5,000	1,000	868.78
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5,000	1,000	868.78
10237	Xylene (Total)	1330-20-7	2,100	J	5,000	1,000	868.78
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	27		19	4	1
10727	Benzo(a)anthracene	56-55-3	90		19	4	1
10727	Benzo(a)pyrene	50-32-8	92		19	4	1
10727	Benzo(b)fluoranthene	205-99-2	130		19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	83		19	4	1
10727	Chrysene	218-01-9	110		19	4	1
10727	Fluorene	86-73-7	17	J	19	4	1
10727	Naphthalene	91-20-3	70		19	4	1
10727	Phenanthrene	85-01-8	87		19	4	1
10727	Pyrene	129-00-0	160		19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	14.0		1.50	0.511	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	13.2		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 12:42	Anita M Dale	868.78
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 13:19	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 13:19	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-034-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336834
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 13:19 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
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Niagara Falls NY 14304

M2912 SDG#: MHF29-12

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 13:19	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 14:46	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:06	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-034-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336835
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 13:38 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
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Niagara Falls NY 14304

M2913 SDG#: MHF29-13

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	96,000		4,700	470	854.52
10237	1,2-Dibromoethane	106-93-4	N.D.		4,700	940	854.52
10237	1,2-Dichloroethane	107-06-2	N.D.		4,700	940	854.52
10237	Ethylbenzene	100-41-4	1,200	J	4,700	940	854.52
10237	Isopropylbenzene	98-82-8	360,000		47,000	9,400	8545.17
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,700	470	854.52
10237	Toluene	108-88-3	81,000		4,700	940	854.52
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4,700	940	854.52
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4,700	940	854.52
10237	Xylene (Total)	1330-20-7	3,800	J	4,700	940	854.52
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	N.D.		92	18	5
10727	Benzo(a)anthracene	56-55-3	50	J	92	18	5
10727	Benzo(a)pyrene	50-32-8	39	J	92	18	5
10727	Benzo(b)fluoranthene	205-99-2	84	J	92	18	5
10727	Benzo(g,h,i)perylene	191-24-2	42	J	92	18	5
10727	Chrysene	218-01-9	95		92	18	5
10727	Fluorene	86-73-7	33	J	92	18	5
10727	Naphthalene	91-20-3	160		92	18	5
10727	Phenanthrene	85-01-8	120		92	18	5
10727	Pyrene	129-00-0	120		92	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	15.3		1.17	0.397	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.9		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 13:05	Anita M Dale	854.52
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161161AA	04/25/2016 17:22	Anita M Dale	8545.17
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 13:38	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-034-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336835
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 13:38 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2913 SDG#: MHF29-13

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 13:38	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 13:38	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/25/2016 23:35	William H Saadeh	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:17	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-033-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336836
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:08 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2914 SDG#: MHF29-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	3	J	4	0.4	0.78
10237	1,2-Dibromoethane	106-93-4	N.D.		4	0.9	0.78
10237	1,2-Dichloroethane	107-06-2	N.D.		4	0.9	0.78
10237	Ethylbenzene	100-41-4	N.D.		4	0.9	0.78
10237	Isopropylbenzene	98-82-8	19		4	0.9	0.78
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4	0.4	0.78
10237	Toluene	108-88-3	N.D.		4	0.9	0.78
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4	0.9	0.78
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4	0.9	0.78
10237	Xylene (Total)	1330-20-7	N.D.		4	0.9	0.78
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	30	J	92	18	5
10727	Benzo(a)anthracene	56-55-3	120		92	18	5
10727	Benzo(a)pyrene	50-32-8	130		92	18	5
10727	Benzo(b)fluoranthene	205-99-2	180		92	18	5
10727	Benzo(g,h,i)perylene	191-24-2	130		92	18	5
10727	Chrysene	218-01-9	140		92	18	5
10727	Fluorene	86-73-7	N.D.		92	18	5
10727	Naphthalene	91-20-3	N.D.		92	18	5
10727	Phenanthrene	85-01-8	58	J	92	18	5
10727	Pyrene	129-00-0	190		92	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	12.8		1.20	0.406	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.4		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 15:20	Jennifer K Howe	0.78
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 14:08	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 14:08	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-033-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336836
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:08 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2914 SDG#: MHF29-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 14:08	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 15:28	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:20	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004A	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-033-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336837
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:15 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2915 SDG#: MHF29-15

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		210	21	39.53
10237	1,2-Dibromoethane	106-93-4	N.D.		210	42	39.53
10237	1,2-Dichloroethane	107-06-2	N.D.		210	42	39.53
10237	Ethylbenzene	100-41-4	N.D.		210	42	39.53
10237	Isopropylbenzene	98-82-8	130	J	210	42	39.53
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		210	21	39.53
10237	Toluene	108-88-3	N.D.		210	42	39.53
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		210	42	39.53
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		210	42	39.53
10237	Xylene (Total)	1330-20-7	N.D.		210	42	39.53
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	6	J	18	3	1
10727	Benzo(a)anthracene	56-55-3	26		18	3	1
10727	Benzo(a)pyrene	50-32-8	28		18	3	1
10727	Benzo(b)fluoranthene	205-99-2	32		18	3	1
10727	Benzo(g,h,i)perylene	191-24-2	29		18	3	1
10727	Chrysene	218-01-9	32		18	3	1
10727	Fluorene	86-73-7	N.D.		18	3	1
10727	Naphthalene	91-20-3	14	J	18	3	1
10727	Phenanthrene	85-01-8	11	J	18	3	1
10727	Pyrene	129-00-0	42		18	3	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	9.85		1.18	0.401	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	5.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 12:31	Anita M Dale	39.53
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 14:15	Client Supplied	1

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Analysis Report

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Sample Description: AOI6-BH16-033-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336837
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:15 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2915 SDG#: MHF29-15

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 14:15	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 14:15	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/25/2016 23:56	William H Saadeh	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:24	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004B	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-032-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336838
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:32 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2916 SDG#: MHF29-16

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	120	J	220	22	41.07
10237	1,2-Dibromoethane	106-93-4	N.D.		220	45	41.07
10237	1,2-Dichloroethane	107-06-2	N.D.		220	45	41.07
10237	Ethylbenzene	100-41-4	51	J	220	45	41.07
10237	Isopropylbenzene	98-82-8	1,700		220	45	41.07
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		220	22	41.07
10237	Toluene	108-88-3	91	J	220	45	41.07
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		220	45	41.07
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		220	45	41.07
10237	Xylene (Total)	1330-20-7	130	J	220	45	41.07
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	8	J	18	4	1
10727	Benzo(a)anthracene	56-55-3	32		18	4	1
10727	Benzo(a)pyrene	50-32-8	36		18	4	1
10727	Benzo(b)fluoranthene	205-99-2	49		18	4	1
10727	Benzo(g,h,i)perylene	191-24-2	32		18	4	1
10727	Chrysene	218-01-9	38		18	4	1
10727	Fluorene	86-73-7	N.D.		18	4	1
10727	Naphthalene	91-20-3	N.D.		18	4	1
10727	Phenanthrene	85-01-8	25		18	4	1
10727	Pyrene	129-00-0	57		18	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	10.3		1.12	0.380	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 12:55	Anita M Dale	41.07
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 14:32	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 14:32	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-032-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336838
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:32 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2916 SDG#: MHF29-16

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 14:32	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 16:10	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:27	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004B	04/20/2016 17:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-032-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336839
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:35 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2917 SDG#: MHF29-17

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	3,700		770	77	140.65
10237	1,2-Dibromoethane	106-93-4	N.D.		770	150	140.65
10237	1,2-Dichloroethane	107-06-2	N.D.		770	150	140.65
10237	Ethylbenzene	100-41-4	3,600		770	150	140.65
10237	Isopropylbenzene	98-82-8	110,000		3,900	770	703.23
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		770	77	140.65
10237	Toluene	108-88-3	45,000		770	150	140.65
10237	1,2,4-Trimethylbenzene	95-63-6	700	J	770	150	140.65
10237	1,3,5-Trimethylbenzene	108-67-8	370	J	770	150	140.65
10237	Xylene (Total)	1330-20-7	17,000		770	150	140.65
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	4	J	18	4	1
10727	Benzo(a)anthracene	56-55-3	14	J	18	4	1
10727	Benzo(a)pyrene	50-32-8	13	J	18	4	1
10727	Benzo(b)fluoranthene	205-99-2	21		18	4	1
10727	Benzo(g,h,i)perylene	191-24-2	16	J	18	4	1
10727	Chrysene	218-01-9	18	J	18	4	1
10727	Fluorene	86-73-7	8	J	18	4	1
10727	Naphthalene	91-20-3	29		18	4	1
10727	Phenanthrene	85-01-8	13	J	18	4	1
10727	Pyrene	129-00-0	25		18	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	10.6		1.35	0.459	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.0		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 09:02	Anita M Dale	703.23
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 14:05	Anita M Dale	140.65
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 14:35	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-032-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336839
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 14:35 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2917 SDG#: MHF29-17

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 14:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 14:35	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 16:31	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 08:59	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004B	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: TB-AOI6-4-13-16 Methanol
Philadelphia Refinery

LL Sample # G5 8336840
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/13/2016 09:14

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2918 SDG#: MHF29-18TB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/kg	ug/kg	ug/kg	
10237	Benzene	71-43-2	N.D.	5	0.5	1
10237	1,2-Dibromoethane	106-93-4	N.D.	5	1	1
10237	1,2-Dichloroethane	107-06-2	N.D.	5	1	1
10237	Ethylbenzene	100-41-4	N.D.	5	1	1
10237	Isopropylbenzene	98-82-8	N.D.	5	1	1
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	1
10237	Toluene	108-88-3	N.D.	5	1	1
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	1	1
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	1	1
10237	Xylene (Total)	1330-20-7	N.D.	5	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161171AA	04/26/2016 11:29	Jennifer K Howe	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/13/2016 09:14	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/13/2016 09:14	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/13/2016 09:14	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-036-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336841
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 08:36 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2919 SDG#: MHF29-19

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	550	J	4,500	450	811.58
10237	1,2-Dibromoethane	106-93-4	N.D.		4,500	910	811.58
10237	1,2-Dichloroethane	107-06-2	N.D.		4,500	910	811.58
10237	Ethylbenzene	100-41-4	N.D.		4,500	910	811.58
10237	Isopropylbenzene	98-82-8	59,000		4,500	910	811.58
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,500	450	811.58
10237	Toluene	108-88-3	N.D.		4,500	910	811.58
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4,500	910	811.58
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4,500	910	811.58
10237	Xylene (Total)	1330-20-7	N.D.		4,500	910	811.58
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	64	J	94	18	5
10727	Benzo(a)anthracene	56-55-3	350		94	18	5
10727	Benzo(a)pyrene	50-32-8	300		94	18	5
10727	Benzo(b)fluoranthene	205-99-2	570		94	18	5
10727	Benzo(g,h,i)perylene	191-24-2	270		94	18	5
10727	Chrysene	218-01-9	410		94	18	5
10727	Fluorene	86-73-7	35	J	94	18	5
10727	Naphthalene	91-20-3	99		94	18	5
10727	Phenanthrene	85-01-8	260		94	18	5
10727	Pyrene	129-00-0	510		94	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	60.8		1.33	0.452	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	10.5		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 09:25	Anita M Dale	811.58
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 08:36	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 08:36	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-036-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336841
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 08:36 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2919 SDG#: MHF29-19

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 08:36	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 16:52	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:31	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004B	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-036-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336842
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 08:49 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2920 SDG#: MHF29-20

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	700	J	4,200	420	765.57
10237	1,2-Dibromoethane	106-93-4	N.D.		4,200	830	765.57
10237	1,2-Dichloroethane	107-06-2	N.D.		4,200	830	765.57
10237	Ethylbenzene	100-41-4	N.D.		4,200	830	765.57
10237	Isopropylbenzene	98-82-8	180,000		4,200	830	765.57
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,200	420	765.57
10237	Toluene	108-88-3	N.D.		4,200	830	765.57
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4,200	830	765.57
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4,200	830	765.57
10237	Xylene (Total)	1330-20-7	N.D.		4,200	830	765.57
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	36		18	4	1
10727	Benzo(a)anthracene	56-55-3	86		18	4	1
10727	Benzo(a)pyrene	50-32-8	88		18	4	1
10727	Benzo(b)fluoranthene	205-99-2	120		18	4	1
10727	Benzo(g,h,i)perylene	191-24-2	83		18	4	1
10727	Chrysene	218-01-9	100		18	4	1
10727	Fluorene	86-73-7	10	J	18	4	1
10727	Naphthalene	91-20-3	18	J	18	4	1
10727	Phenanthrene	85-01-8	77		18	4	1
10727	Pyrene	129-00-0	160		18	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	18.9		1.20	0.408	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.0		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 09:48	Anita M Dale	765.57
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 08:49	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 08:49	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-036-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336842
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 08:49 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2920 SDG#: MHF29-20

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 08:49	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 17:54	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:35	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004B	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-037-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336843
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 09:18 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2921 SDG#: MHF29-21

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	710,000		94,000	9,400	15932.9
10237	1,2-Dibromoethane	106-93-4	N.D.		94,000	19,000	15932.9
10237	1,2-Dichloroethane	107-06-2	N.D.		94,000	19,000	15932.9
10237	Ethylbenzene	100-41-4	N.D.		94,000	19,000	15932.9
10237	Isopropylbenzene	98-82-8	6,500,000		760,000	150,000	129032.25
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		94,000	9,400	15932.9
10237	Toluene	108-88-3	840,000		94,000	19,000	15932.9
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		94,000	19,000	15932.9
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		94,000	19,000	15932.9
10237	Xylene (Total)	1330-20-7	26,000	J	94,000	19,000	15932.9
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	68	J	100	20	5
10727	Benzo(a)anthracene	56-55-3	110		100	20	5
10727	Benzo(a)pyrene	50-32-8	160		100	20	5
10727	Benzo(b)fluoranthene	205-99-2	240		100	20	5
10727	Benzo(g,h,i)perylene	191-24-2	190		100	20	5
10727	Chrysene	218-01-9	140		100	20	5
10727	Fluorene	86-73-7	49	J	100	20	5
10727	Naphthalene	91-20-3	1,300		100	20	5
10727	Phenanthrene	85-01-8	180		100	20	5
10727	Pyrene	129-00-0	220		100	20	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	100		1.46	0.496	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	15.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 10:12	Anita M Dale	15932.9
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 14:29	Anita M Dale	129032.25
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 09:18	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-037-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336843
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 09:18 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2921 SDG#: MHF29-21

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 09:18	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 09:18	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16113SLD026	04/24/2016 18:15	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16113SLD026	04/23/2016 07:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708004	04/27/2016 10:38	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708004	04/26/2016 05:40	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820004B	04/20/2016 17:31	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-037-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336844
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 09:26 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2922 SDG#: MHF29-22

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	850,000		97,000	9,700	16586.3
10237	1,2-Dibromoethane	106-93-4	N.D.		97,000	19,000	16586.3
10237	1,2-Dichloroethane	107-06-2	N.D.		97,000	19,000	16586.3
10237	Ethylbenzene	100-41-4	N.D.		97,000	19,000	16586.3
10237	Isopropylbenzene	98-82-8	8,500,000		970,000	190,000	165863
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		97,000	9,700	16586.3
10237	Toluene	108-88-3	1,200,000		97,000	19,000	16586.3
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		97,000	19,000	16586.3
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		97,000	19,000	16586.3
10237	Xylene (Total)	1330-20-7	27,000	J	97,000	19,000	16586.3
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	110		20	4	1
10727	Benzo(a)anthracene	56-55-3	50		20	4	1
10727	Benzo(a)pyrene	50-32-8	74		20	4	1
10727	Benzo(b)fluoranthene	205-99-2	110		20	4	1
10727	Benzo(g,h,i)perylene	191-24-2	70		20	4	1
10727	Chrysene	218-01-9	53		20	4	1
10727	Fluorene	86-73-7	33		20	4	1
10727	Naphthalene	91-20-3	1,400		20	4	1
10727	Phenanthrene	85-01-8	3,200		20	4	1
10727	Pyrene	129-00-0	84		20	4	1

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and internal standard areas are again outside of the QC acceptance limits, indicating a matrix effect. The reported data is from the initial analysis of the sample.

Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	105		1.72	0.584	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	14.4		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-037-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336844
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 09:26 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2922 SDG#: MHF29-22

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016	10:35	Anita M Dale	16586.3
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016	14:52	Anita M Dale	165863
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016	09:26	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016	09:26	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016	09:26	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016	01:46	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16114SLA026	04/25/2016	08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708005	04/27/2016	06:27	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708005	04/26/2016	06:30	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820006A	04/20/2016	18:34	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-038-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336845
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 10:17 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2923 SDG#: MHF29-23

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	8,800		4,800	480	869.59
10237	1,2-Dibromoethane	106-93-4	N.D.		4,800	970	869.59
10237	1,2-Dichloroethane	107-06-2	N.D.		4,800	970	869.59
10237	Ethylbenzene	100-41-4	N.D.		4,800	970	869.59
10237	Isopropylbenzene	98-82-8	14,000		4,800	970	869.59
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,800	480	869.59
10237	Toluene	108-88-3	N.D.		4,800	970	869.59
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4,800	970	869.59
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4,800	970	869.59
10237	Xylene (Total)	1330-20-7	N.D.		4,800	970	869.59
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	73	J	94	18	1
10727	Benzo(a)anthracene	56-55-3	190		94	18	1
10727	Benzo(a)pyrene	50-32-8	220		94	18	1
10727	Benzo(b)fluoranthene	205-99-2	330		94	18	1
10727	Benzo(g,h,i)perylene	191-24-2	200		94	18	1
10727	Chrysene	218-01-9	220		94	18	1
10727	Fluorene	86-73-7	36	J	94	18	1
10727	Naphthalene	91-20-3	93	J	94	18	1
10727	Phenanthrene	85-01-8	180		94	18	1
10727	Pyrene	129-00-0	280		94	18	1
	Reporting limits were raised due to interference from the sample matrix.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	33.1		1.14	0.389	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	10.1		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 10:59	Anita M Dale	869.59
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 10:17	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: AOI6-BH16-038-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336845
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 10:17 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2923 SDG#: MHF29-23

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 10:17	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 10:17	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016 02:09	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708005	04/27/2016 06:36	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708005	04/26/2016 06:30	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820006A	04/20/2016 18:34	Scott W Freisher	1

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Analysis Report

Sample Description: TB-AOI6-04-14-16 Methanol
Philadelphia Refinery

LL Sample # G5 8336846
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 08:50

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Suite #3
Niagara Falls NY 14304

M2924 SDG#: MHF29-24TB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/kg	ug/kg	ug/kg	
10237	Benzene	71-43-2	N.D.	250	25	50
10237	1,2-Dibromoethane	106-93-4	N.D.	250	50	50
10237	1,2-Dichloroethane	107-06-2	N.D.	250	50	50
10237	Ethylbenzene	100-41-4	N.D.	250	50	50
10237	Isopropylbenzene	98-82-8	N.D.	250	50	50
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	250	25	50
10237	Toluene	108-88-3	N.D.	250	50	50
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	250	50	50
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	250	50	50
10237	Xylene (Total)	1330-20-7	N.D.	250	50	50

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 15:15	Anita M Dale	50
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 08:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 08:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 08:50	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-030-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336847
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 11:14 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2925 SDG#: MHF29-25

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	9,400		4,400	440	779.26
10237	1,2-Dibromoethane	106-93-4	N.D.		4,400	880	779.26
10237	1,2-Dichloroethane	107-06-2	N.D.		4,400	880	779.26
10237	Ethylbenzene	100-41-4	N.D.		4,400	880	779.26
10237	Isopropylbenzene	98-82-8	18,000		4,400	880	779.26
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,400	440	779.26
10237	Toluene	108-88-3	N.D.		4,400	880	779.26
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4,400	880	779.26
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4,400	880	779.26
10237	Xylene (Total)	1330-20-7	N.D.		4,400	880	779.26
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	37	J	95	19	1
10727	Benzo(a)anthracene	56-55-3	94	J	95	19	1
10727	Benzo(a)pyrene	50-32-8	120		95	19	1
10727	Benzo(b)fluoranthene	205-99-2	180		95	19	1
10727	Benzo(g,h,i)perylene	191-24-2	130		95	19	1
10727	Chrysene	218-01-9	98		95	19	1
10727	Fluorene	86-73-7	N.D.		95	19	1
10727	Naphthalene	91-20-3	24	J	95	19	1
10727	Phenanthrene	85-01-8	54	J	95	19	1
10727	Pyrene	129-00-0	130		95	19	1
	Reporting limits were raised due to interference from the sample matrix.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	66.0		1.18	0.400	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	11.4		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 11:22	Anita M Dale	779.26
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 11:14	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-030-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336847
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 11:14 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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Niagara Falls NY 14304

M2925 SDG#: MHF29-25

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 11:14	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 11:14	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016 02:32	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708005	04/27/2016 06:40	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708005	04/26/2016 06:30	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820006A	04/20/2016 18:34	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-030-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336848
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 11:30 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2926 SDG#: MHF29-26

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	130,000		4,300	430	764.98
10237	1,2-Dibromoethane	106-93-4	N.D.		4,300	870	764.98
10237	1,2-Dichloroethane	107-06-2	N.D.		4,300	870	764.98
10237	Ethylbenzene	100-41-4	N.D.		4,300	870	764.98
10237	Isopropylbenzene	98-82-8	710,000		43,000	8,700	7649.8
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		4,300	430	764.98
10237	Toluene	108-88-3	20,000		4,300	870	764.98
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		4,300	870	764.98
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		4,300	870	764.98
10237	Xylene (Total)	1330-20-7	2,900	J	4,300	870	764.98
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	160		19	4	1
10727	Benzo(a)anthracene	56-55-3	79		19	4	1
10727	Benzo(a)pyrene	50-32-8	79		19	4	1
10727	Benzo(b)fluoranthene	205-99-2	180		19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	73		19	4	1
10727	Chrysene	218-01-9	94		19	4	1
10727	Fluorene	86-73-7	34		19	4	1
10727	Naphthalene	91-20-3	2,400		19	4	1
10727	Phenanthrene	85-01-8	3,300		19	4	1
10727	Pyrene	129-00-0	140		19	4	1

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and internal standard areas are again outside of the QC acceptance limits, indicating a matrix effect. The reported data is from the initial analysis of the sample.

Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	34.3		1.35	0.458	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	11.6		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

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Analysis Report

Sample Description: AOI6-BH16-030-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336848
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 11:30 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
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Niagara Falls NY 14304

M2926 SDG#: MHF29-26

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 11:45	Anita M Dale	764.98
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161181AA	04/27/2016 10:43	Anita M Dale	7649.8
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 11:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 11:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 11:30	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016 02:56	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708005	04/27/2016 06:43	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708005	04/26/2016 06:30	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820006A	04/20/2016 18:34	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-031-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336849
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 11:44 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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2055 Niagara Falls Blvd.
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M2927 SDG#: MHF29-27

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	630		220	22	39.38
10237	1,2-Dibromoethane	106-93-4	N.D.		220	44	39.38
10237	1,2-Dichloroethane	107-06-2	N.D.		220	44	39.38
10237	Ethylbenzene	100-41-4	53	J	220	44	39.38
10237	Isopropylbenzene	98-82-8	4,000		220	44	39.38
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		220	22	39.38
10237	Toluene	108-88-3	N.D.		220	44	39.38
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		220	44	39.38
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		220	44	39.38
10237	Xylene (Total)	1330-20-7	83	J	220	44	39.38
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	N.D.		19	4	1
10727	Benzo(a)anthracene	56-55-3	4	J	19	4	1
10727	Benzo(a)pyrene	50-32-8	6	J	19	4	1
10727	Benzo(b)fluoranthene	205-99-2	7	J	19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	5	J	19	4	1
10727	Chrysene	218-01-9	5	J	19	4	1
10727	Fluorene	86-73-7	N.D.		19	4	1
10727	Naphthalene	91-20-3	N.D.		19	4	1
10727	Phenanthrene	85-01-8	4	J	19	4	1
10727	Pyrene	129-00-0	7	J	19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	5.63		1.43	0.486	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	10.4		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 13:18	Anita M Dale	39.38
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 11:44	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 11:44	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-031-0-2-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336849
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 11:44 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

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M2927 SDG#: MHF29-27

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 11:44	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/26/2016 03:20	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708005	04/27/2016 06:47	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708005	04/26/2016 06:30	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820006A	04/20/2016 18:34	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-031-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336850
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 12:01 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2928 SDG#: MHF29-28

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	27,000		2,000	200	357.81
10237	1,2-Dibromoethane	106-93-4	N.D.		2,000	390	357.81
10237	1,2-Dichloroethane	107-06-2	N.D.		2,000	390	357.81
10237	Ethylbenzene	100-41-4	2,900		2,000	390	357.81
10237	Isopropylbenzene	98-82-8	180,000		3,900	780	715.62
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		2,000	200	357.81
10237	Toluene	108-88-3	22,000		2,000	390	357.81
10237	1,2,4-Trimethylbenzene	95-63-6	960	J	2,000	390	357.81
10237	1,3,5-Trimethylbenzene	108-67-8	440	J	2,000	390	357.81
10237	Xylene (Total)	1330-20-7	12,000		2,000	390	357.81
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	14	J	19	4	1
10727	Benzo(a)anthracene	56-55-3	14	J	19	4	1
10727	Benzo(a)pyrene	50-32-8	12	J	19	4	1
10727	Benzo(b)fluoranthene	205-99-2	19		19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	8	J	19	4	1
10727	Chrysene	218-01-9	20		19	4	1
10727	Fluorene	86-73-7	47		19	4	1
10727	Naphthalene	91-20-3	62		19	4	1
10727	Phenanthrene	85-01-8	59		19	4	1
10727	Pyrene	129-00-0	33		19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	6.19		1.47	0.498	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.6		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161171AA	04/26/2016 12:08	Anita M Dale	715.62
10237	VOCs- Solid by 8260B	SW-846 8260B	1	R161181AA	04/27/2016 10:20	Anita M Dale	357.81
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201610740850	04/14/2016 12:01	Client Supplied	1

*=This limit was used in the evaluation of the final result

eurofins
Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: AOI6-BH16-031-2-4-soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8336850
LL Group # 1651423
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/14/2016 12:01 by AC

Submitted: 04/15/2016 14:30
Reported: 06/29/2016 14:39

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M2928 SDG#: MHF29-28

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201610740850	04/14/2016 12:01	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201610740850	04/14/2016 12:01	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16114SLA026	04/25/2016 23:24	Kelli M Barto	1
10809	BNA Soil Microwave	SW-846 3546	1	16114SLA026	04/25/2016 08:30	Scott J Carini	1
06955	Lead	SW-846 6010B	1	161165708005	04/27/2016 06:50	Matthew R Machtinger	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161165708005	04/26/2016 06:30	Lisa J Cooke	1
00111	Moisture	SM 2540 G-1997	1	16111820006A	04/20/2016 18:34	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: R161161AA	Sample number(s): 8336827-8336829,8336831,8336834-8336835		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: R161171AA	Sample number(s): 8336837-8336839,8336841-8336850		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: R161181AA	Sample number(s): 8336848,8336850		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: X161171AA	Sample number(s): 8336823-8336826,8336830,8336832-8336833,8336836,8336840		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: 16113SLD026	Sample number(s): 8336823-8336839,8336841-8336843		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3
Batch number: 16114SLA026	Sample number(s): 8336844-8336845,8336847-8336850		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3
	mg/kg	mg/kg	mg/kg
Batch number: 161165708004	Sample number(s): 8336823-8336839,8336841-8336843		
Lead	N.D.	1.50	0.510
Batch number: 161165708005	Sample number(s): 8336844-8336845,8336847-8336850		
Lead	N.D.	1.50	0.510

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: R161161AA	Sample number(s): 8336827-8336829,8336831,8336834-8336835								
Benzene	1000	1058.67	1000	967.05	106	97	80-120	9	30
1,2-Dibromoethane	1000	997.68	1000	877.36	100	88	80-120	13	30
1,2-Dichloroethane	1000	1043.72	1000	942.05	104	94	77-130	10	30
Ethylbenzene	1000	998.33	1000	901.56	100	90	80-120	10	30
Isopropylbenzene	1000	1005.51	1000	926.11	101	93	70-120	8	30
Methyl Tertiary Butyl Ether	1000	1048.66	1000	964.39	105	96	72-120	8	30
Toluene	1000	1011.8	1000	884.7	101	88	80-120	13	30
1,2,4-Trimethylbenzene	1000	932.71	1000	849.63	93	85	74-120	9	30
1,3,5-Trimethylbenzene	1000	943.08	1000	920.27	94	92	73-120	2	30

*- Outside of specification
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P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Xylene (Total)	3000	3039.89	3000	2779.89	101	93	80-120	9	30
Batch number: R161171AA	Sample number(s): 8336837-8336839,8336841-8336850								
Benzene	1000	958.68	1000	934.18	96	93	80-120	3	30
1,2-Dibromoethane	1000	891.69	1000	898.18	89	90	80-120	1	30
1,2-Dichloroethane	1000	938.81	1000	922.93	94	92	77-130	2	30
Ethylbenzene	1000	869.77	1000	855.88	87	86	80-120	2	30
Isopropylbenzene	1000	871.1	1000	858.08	87	86	70-120	2	30
Methyl Tertiary Butyl Ether	1000	953.08	1000	936.29	95	94	72-120	2	30
Toluene	1000	880.29	1000	882.86	88	88	80-120	0	30
1,2,4-Trimethylbenzene	1000	815.04	1000	794.52	82	79	74-120	3	30
1,3,5-Trimethylbenzene	1000	816.17	1000	793.39	82	79	73-120	3	30
Xylene (Total)	3000	2666.64	3000	2628.38	89	88	80-120	1	30
Batch number: R161181AA	Sample number(s): 8336848,8336850								
Benzene	1000	965.74	1000	950.13	97	95	80-120	2	30
1,2-Dibromoethane	1000	869.45	1000	893.79	87	89	80-120	3	30
1,2-Dichloroethane	1000	938.59	1000	911.47	94	91	77-130	3	30
Ethylbenzene	1000	860.07	1000	858.9	86	86	80-120	0	30
Isopropylbenzene	1000	855.12	1000	861.25	86	86	70-120	1	30
Methyl Tertiary Butyl Ether	1000	956.47	1000	953.81	96	95	72-120	0	30
Toluene	1000	876.56	1000	901.69	88	90	80-120	3	30
1,2,4-Trimethylbenzene	1000	830.73	1000	815.1	83	82	74-120	2	30
1,3,5-Trimethylbenzene	1000	831.48	1000	818.83	83	82	73-120	2	30
Xylene (Total)	3000	2583.32	3000	2644.06	86	88	80-120	2	30
Batch number: X161171AA	Sample number(s): 8336823-8336826,8336830,8336832-8336833,8336836,8336840								
Benzene	20	21.22	20	20.96	106	105	80-120	1	30
1,2-Dibromoethane	20	18.04	20	17.83	90	89	80-120	1	30
1,2-Dichloroethane	20	22.49	20	22.44	112	112	77-130	0	30
Ethylbenzene	20	19.78	20	19.49	99	97	80-120	1	30
Isopropylbenzene	20	19.2	20	18.91	96	95	70-120	2	30
Methyl Tertiary Butyl Ether	20	18.37	20	18.53	92	93	72-120	1	30
Toluene	20	19.66	20	19.35	98	97	80-120	2	30
1,2,4-Trimethylbenzene	20	18.39	20	18.18	92	91	74-120	1	30
1,3,5-Trimethylbenzene	20	18.26	20	17.89	91	89	73-120	2	30
Xylene (Total)	60	56.88	60	56.34	95	94	80-120	1	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16113SLD026	Sample number(s): 8336823-8336839,8336841-8336843								
Anthracene	1666.67	1623.12			97		82-118		
Benzo(a)anthracene	1666.67	1636.78			98		76-119		
Benzo(a)pyrene	1666.67	1709.91			103		85-117		
Benzo(b)fluoranthene	1666.67	1826.41			110		78-129		
Benzo(g,h,i)perylene	1666.67	1483.44			89		77-118		
Chrysene	1666.67	1629.89			98		80-121		
Fluorene	1666.67	1614.92			97		86-118		
Naphthalene	1666.67	1591.82			96		82-112		
Phenanthrene	1666.67	1562.67			94		80-114		
Pyrene	1666.67	1556.91			93		81-114		

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16114SLA026	Sample number(s): 8336844-8336845,8336847-8336850								
Anthracene	1666.67	1544.2			93		82-118		
Benzo(a)anthracene	1666.67	1420.71			85		76-119		
Benzo(a)pyrene	1666.67	1607.76			96		85-117		
Benzo(b)fluoranthene	1666.67	1484.78			89		78-129		
Benzo(g,h,i)perylene	1666.67	1572.42			94		77-118		
Chrysene	1666.67	1466.17			88		80-121		
Fluorene	1666.67	1501.04			90		86-118		
Naphthalene	1666.67	1597.79			96		82-112		
Phenanthrene	1666.67	1478.83			89		80-114		
Pyrene	1666.67	1446.73			87		81-114		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161165708004	Sample number(s): 8336823-8336839,8336841-8336843								
Lead	15	15.77			105		80-120		
Batch number: 161165708005	Sample number(s): 8336844-8336845,8336847-8336850								
Lead	15	16.88			113		80-120		
	%	%	%	%					
Batch number: 16111820004A	Sample number(s): 8336823-8336836								
Moisture	89.5	89.46			100		99-101		
Batch number: 16111820004B	Sample number(s): 8336837-8336839,8336841-8336843								
Moisture	89.5	89.46			100		99-101		
Batch number: 16111820006A	Sample number(s): 8336844-8336845,8336847-8336850								
Moisture	89.5	89.43			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16113SLD026	Sample number(s): 8336823-8336839,8336841-8336843 UNSPK: 8336841									
Anthracene	57.72	1666.11	1582.07	1639.88	1537.85	91	90	82-118	3	30
Benzo(a)anthracene	309.78	1666.11	1911.37	1639.88	1899.88	96	97	76-119	1	30
Benzo(a)pyrene	270.56	1666.11	1680.18	1639.88	1726.02	85	89	85-117	3	30
Benzo(b)fluoranthene	512.01	1666.11	2008.04	1639.88	2144.89	90	100	78-129	7	30
Benzo(g,h,i)perylene	243.46	1666.11	1828.76	1639.88	1905.85	95	101	77-118	4	30
Chrysene	369.01	1666.11	1931.56	1639.88	1887.16	94	93	80-121	2	30
Fluorene	31.03	1666.11	1372	1639.88	1318.39	80*	79*	86-118	4	30
Naphthalene	88.92	1666.11	1590.55	1639.88	1590.82	90	92	82-112	0	30
Phenanthrene	235.09	1666.11	1739.09	1639.88	1712.63	90	90	80-114	2	30
Pyrene	458.04	1666.11	1932.82	1639.88	2040.03	89	96	81-114	5	30

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16114SLA026	Sample number(s): 8336844-8336845,8336847-8336850 UNSPK: 8336850									
Anthracene	12.96	1647.45	1565.18	1650.71	1436.81	94	86	82-118	9	30
Benzo(a)anthracene	12.39	1647.45	1368.72	1650.71	1278.37	82	77	76-119	7	30
Benzo(a)pyrene	10.83	1647.45	1569.27	1650.71	1451.61	95	87	85-117	8	30
Benzo(b)fluoranthene	17.4	1647.45	1584.72	1650.71	1309.31	95	78	78-129	19	30
Benzo(g,h,i)perylene	7.31	1647.45	1606.08	1650.71	1477.95	97	89	77-118	8	30
Chrysene	17.95	1647.45	1452.29	1650.71	1342.43	87	80	80-121	8	30
Fluorene	43.02	1647.45	1495.02	1650.71	1391.08	88	82*	86-118	7	30
Naphthalene	57.02	1647.45	1590.88	1650.71	1492.78	93	87	82-112	6	30
Phenanthrene	53.53	1647.45	1522.21	1650.71	1409.77	89	82	80-114	8	30
Pyrene	30.23	1647.45	1462.8	1650.71	1377.8	87	82	81-114	6	30
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161165708004	Sample number(s): 8336823-8336839,8336841-8336843 UNSPK: 8336839									
Lead	9.62	11.72	18.18	13.27	18.93	73*	70*	75-125	4	20
Batch number: 161165708005	Sample number(s): 8336844-8336845,8336847-8336850 UNSPK: P346772									
Lead	115.47	14.29	120.32	13.51	131.13	34 (2)	116 (2)	75-125	9	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161165708004	Sample number(s): 8336823-8336839,8336841-8336843 BKG: 8336839			
Lead	9.62	7.40	26*	20
Batch number: 161165708005	Sample number(s): 8336844-8336845,8336847-8336850 BKG: P346772			
Lead	115.47	123.8	7	20
	%	%		
Batch number: 16111820004A	Sample number(s): 8336823-8336836 BKG: 8336836			
Moisture	8.37	7.12	16*	5
Batch number: 16111820004B	Sample number(s): 8336837-8336839,8336841-8336843 BKG: 8336842			
Moisture	7.97	8.33	4	5
Batch number: 16111820006A	Sample number(s): 8336844-8336845,8336847-8336850 BKG: P334197			
Moisture	3.98	4.24	6*	5

*- Outside of specification
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Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- Solid by 8260B
Batch number: R161161AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8336827	69	67	65	79
8336828	68	68	65	83
8336829	62	61	55	53
8336831	56	53*	59	82
8336834	83	77	72	74
8336835	72	69	64	68
Blank	94	95	86	77
LCS	103	104	94	91
LCSD	92	92	80	82
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: R161171AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8336837	79	80	68	63
8336838	74	75	65	63
8336839	68	67	59	58
8336841	63	66	59	55
8336842	67	68	60	59
8336843	0*	0*	46*	56
8336844	0*	0*	45*	41*
8336845	61	65	53	50
8336846	99	99	87	81
8336847	58	60	47*	49*
8336848	61	65	54	53
8336849	68	69	60	58
Blank	103	106	98	89
LCS	93	90	80	79
LCSD	90	89	79	76
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: R161181AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8336850	66	66	59	66
Blank	90	91	79	75
LCS	91	93	80	76
LCSD	92	90	80	77
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161171AA

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8336823	109	110	106	78
8336824	107	105	100	94
8336825	108	109	104	88
8336826	107	105	106	68
8336830	107	101	101	96
8336832	105	106	99	101
8336833	105	104	100	100
8336836	105	103	101	93
8336840	107	109	98	98
Blank	107	101	99	96
LCS	105	96	100	101
LCSD	106	97	100	101
Limits:	50-141	54-135	52-141	50-131

Analysis Name: TCL 8270 (microwave)
Batch number: 16113SLD026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8336823	83	84	107
8336824	84	86	100
8336825	76	82	97
8336826	78	83	99
8336827	97	83	105
8336828	97	84	103
8336829	79	81	95
8336830	86	85	105
8336831	101	64	88
8336832	85	87	109
8336833	88	91	107
8336834	80	66	102
8336835	88	87	110
8336836	76	86	97
8336837	89	94	106
8336838	75	78	91
8336839	91	96	105
8336841	74	88	98
8336842	83	87	104
8336843	78	107	107
Blank	90	85	106
LCS	90	88	106
MS	80	98	100
MSD	77	92	104
Limits:	54-123	63-117	59-129

Analysis Name: TCL 8270 (microwave)
Batch number: 16114SLA026

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 06/29/2016 14:39

Group Number: 1651423

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8336844				104	72	88
8336845				100	98	111
8336847				108	106	125
8336848				102	73	98
8336849				96	83	98
8336850	88	94	67	96	82	97
Blank	85	92	73	98	86	102
LCS	93	100	70	96	85	94
MS	87	93	67	96	84	97
MSD	82	90	61	91	78	91
Limits:	58-122	57-126	35-136	54-123	63-117	59-129

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1651423 Sample # 8336823-50

COC # 496123

Client Information

Client: Evergreen 10177	Acct. #:
Project Name/#: Evergreen 11109613	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Alissa Cannon	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Sediment ☐ Soil ☑ Water: Ground ☐ Potable ☐ NPDES ☐ Surface ☐ Other:

Analysis Requested — Preservation Codes

For Lab Use Only: FSC: ____ SCR#: ____

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Remarks: 1 of 3

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	VOCs	Moisture, Lead, Select VOCs									Remarks
AOI6-BH16-002-0-2-Soil	04/12/16	0931	X		5			5	4	1									
AOI6-BH16-005-0-2-Soil	↓	1013	X		5			5	4	1									
AOI6-BH16-003-0-2-Soil	↓	1143	X		5			5	4	1									
AOI6-BH16-001-0-2-Soil	↓	1354	X		5			5	4	1									
AOI6-BH16-029-0-2-Soil	04/13/16	0905	X		5			5	4	1									
AOI6-BH16-029-2-4-Soil	↓	0927	X		5			5	4	1									
~~AOI6-BH16-092~~ AC																			
AOI6-BH16-028-0-2-Soil	↓	1024	X		5			5	4	1									
AOI6-BH16-027-0-2-Soil	↓	1040	X		5			5	4	1									
AOI6-BH16-027-2-4-Soil	↓	1053	X		5			5	4	1									

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Rick Burns	4.15.16	0840	[signature]	4-15-16	0840
[signature]	4/15/16	1430			
			Haitza Fernandez	4/15/16	1430

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.8-0.4°C 0.3

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 1115

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

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Acct. # 10177 Group # 1651423 Sample # 8336823-50

COC # 496120

Client Information

Client: Evergreen 10177

Acct. #:

Project Name/#: Evergreen 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

2 of 3

Sample Identification	Collected Date	Collected Time	Grab	Composite	Sediment	Ground	Surface	Potable	NPDES	Soil ☑	Water	Other:	Total # of Containers	VOCs	Moisture, Lead, select VOCs	Remarks
AOI6-BH16-035-0-2-soil	4/13/16	1127	X							5			5	4	1	
AOI6-BH16-035-2-4-soil		1135	X							5			5	4	1	
AOI6-BH16-034-0-2-soil		1319	X							5			5	4	1	
AOI6-BH16-034-2-4-soil		1338	X							5			5	4	1	
AOI6-BH16-033-0-2-soil		1408	X							5			5	4	1	
AOI6-BH16-033-2-4-soil		1415	X							5			5	4	1	
AOI6-BH16-032-0-2-soil		1432	X							5			5	4	1	
AOI6-BH16-032-2-4-soil		1435	X							5			5	4	1	
TB-AOI6-4-13-16		0914											~~3~~ 1			trip Blank
AOI6-BH16-036-0-2-soil	4/14/16	0836	X							5			5	4	1	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Relinquished by	Date	Time	Received by	Date	Time
[signature]	4-15-16	0840	[signature]	4/15/16	0840
[signature]	4/15/16	1430			
			[signature]	4/15/16	1430

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS FedEx Other

Temperature upon receipt 0.8 - 0.4c - 0.3

Environmental Analysis Request/Chain of Custody

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Acct. # 10177 Group # 1651423 Sample # 8336823-50

COC # 496124

Client Information

Client: Evergreen 10177

Acct. #:

Project Name/#: Evergreen 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Connon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

Remarks

3 of 3

Sample Identification	Collected Date	Collected Time	Grab	Composite	Sediment	Ground	Surface	Potable	NPDES	Soil ☒	Water	Other:	Total # of Containers	VOCs	Moisture, Lead, Select VOCs
AOI6-BH16-036-2-4-soil	4/14/16	0849	X										5	4	1
AOI6-BH16-037-0-2-soil		0918	X										5	4	1
AOI6-BH16-037-2-4-soil		0926	X										5	4	1
AOI6-BH16-038-0-2-soil		1017	X										5	4	1
TB-AOI6-04-14-16		0850	X										3		
AOI6-BH16-030-0-2-soil		1114	X										5	4	1
AOI6-BH16-030-0-2-soil		1130	X										5	4	1
~~AOI6-BH16-030~~ AC															
AOI6-BH16-031-0-2-soil		1144	X										5	4	1
AOI6-BH16-031-2-4-soil		1201	X										5	4	1

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[illegible]	4.15.16	0848	[illegible]	4/15/16	0840
[illegible]	4/15/16	1430			
			Yoltza Fernandez	4/14/16	1430

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS FedEx Other

Temperature upon receipt 0.8-0.4°C-0.3

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Sample Administration Receipt Documentation Log

Doc Log ID: 143069

Group Number(s): 1651423

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	04/15/2016 14:30
Number of Packages:	3	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	6
Samples Intact:	Yes	Trip Blank Type:	See Below
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Trip Blank Type(s): MeOH - Sod. Sulfate

Unpacked by Maritza Fernandez (9906) at 15:53 on 04/15/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.8	DT	Wet	Y	Bagged	N
2	DT131	0.4	DT	Wet	Y	Bagged	N
3	DT131	0.3	DT	Wet	Y	Bagged	N

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Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: May 11, 2016

Project: Philadelphia Refinery

Submittal Date: 04/25/2016
Group Number: 1653975
SDG: MHF32
PO Number: 34004491
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-BH16-023-0-2-Soil Grab Soil	8349798
AOI6-TB-BH16-04/21/16 Methanol	8349799
AOI6-BH16-021-0-2-Soil Grab Soil	8349800
AOI6-BH16-020-0-2-Soil Grab Soil	8349801
AOI6-BH16-019-0-2-Soil Grab Soil	8349802
AOI6-BH16-DUP-Soil-001 Grab Soil	8349803
AOI6-BH16-019-2-4-Soil Grab Soil	8349804
AOI6-BH16-004-0-2-Soil Grab Soil	8349805
AOI6-BH16-DUP-Soil-002 Grab Soil	8349806
AOI6-BH16-004-2-4-Soil Grab Soil	8349807
AOI6-BH16-006-0-2-Soil Grab Soil	8349808
AOI6-BH16-006-2-4-Soil Grab Soil	8349809
AOI6-BH16-025-0-2-Soil Grab Soil	8349810
AOI6-BH16-025-2-4-Soil Grab Soil	8349811
AOI6-BH16-DUP-04-22-16-003 Grab Soil	8349812
AOI6-BH16-026-0-2-Soil Grab Soil	8349813

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-BH16-023-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349798
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 12:10 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M01 SDG#: MHF32-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	130	J	470	47	61.41
10237	1,2-Dibromoethane	106-93-4	N.D.		470	94	61.41
10237	1,2-Dichloroethane	107-06-2	N.D.		470	94	61.41
10237	Ethylbenzene	100-41-4	100	J	470	94	61.41
10237	Isopropylbenzene	98-82-8	340	J	470	94	61.41
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		470	47	61.41
10237	Toluene	108-88-3	200	J	470	94	61.41
10237	1,2,4-Trimethylbenzene	95-63-6	120	J	470	94	61.41
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		470	94	61.41
10237	Xylene (Total)	1330-20-7	210	J	470	94	61.41
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,100		52	10	2
10727	Benzo(a)anthracene	56-55-3	1,300		52	10	2
10727	Benzo(a)pyrene	50-32-8	1,700		52	10	2
10727	Benzo(b)fluoranthene	205-99-2	1,800		52	10	2
10727	Benzo(g,h,i)perylene	191-24-2	1,800		52	10	2
10727	Chrysene	218-01-9	1,500		52	10	2
10727	Fluorene	86-73-7	1,900		52	10	2
10727	Naphthalene	91-20-3	12,000		52	10	2
10727	Phenanthrene	85-01-8	4,800		52	10	2
10727	Pyrene	129-00-0	2,400		52	10	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	393		1.75	0.593	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	34.9		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 09:25	Anita M Dale	61.41
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 12:10	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-023-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349798
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 12:10 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M01 SDG#: MHF32-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 12:10	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 12:10	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 11:08	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:11	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-TB-BH16-04/21/16 Methanol
Philadelphia Refinery

LL Sample # G5 8349799
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 12:48

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

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Suite #3
Niagara Falls NY 14304

32M02 SDG#: MHF32-02TB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation*	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/kg	ug/kg	ug/kg	
10237	Benzene	71-43-2	N.D.	5	0.5	1
10237	1,2-Dibromoethane	106-93-4	N.D.	5	1	1
10237	1,2-Dichloroethane	107-06-2	N.D.	5	1	1
10237	Ethylbenzene	100-41-4	N.D.	5	1	1
10237	Isopropylbenzene	98-82-8	N.D.	5	1	1
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	1
10237	Toluene	108-88-3	N.D.	5	1	1
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	1	1
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	1	1
10237	Xylene (Total)	1330-20-7	N.D.	5	1	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	A161201AA	04/29/2016 11:05	Jennifer K Howe	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 12:48	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 12:48	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 12:48	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-021-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349800
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 13:21 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M03 SDG#: MHF32-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	62	J	240	24	43.68
10237	1,2-Dibromoethane	106-93-4	N.D.		240	48	43.68
10237	1,2-Dichloroethane	107-06-2	N.D.		240	48	43.68
10237	Ethylbenzene	100-41-4	N.D.		240	48	43.68
10237	Isopropylbenzene	98-82-8	N.D.		240	48	43.68
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		240	24	43.68
10237	Toluene	108-88-3	100	J	240	48	43.68
10237	1,2,4-Trimethylbenzene	95-63-6	110	J	240	48	43.68
10237	1,3,5-Trimethylbenzene	108-67-8	82	J	240	48	43.68
10237	Xylene (Total)	1330-20-7	100	J	240	48	43.68
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,000		37	7	2
10727	Benzo(a)anthracene	56-55-3	2,400		37	7	2
10727	Benzo(a)pyrene	50-32-8	2,200		37	7	2
10727	Benzo(b)fluoranthene	205-99-2	3,000		37	7	2
10727	Benzo(g,h,i)perylene	191-24-2	1,400		37	7	2
10727	Chrysene	218-01-9	2,300		37	7	2
10727	Fluorene	86-73-7	530		37	7	2
10727	Naphthalene	91-20-3	1,100		37	7	2
10727	Phenanthrene	85-01-8	3,200		37	7	2
10727	Pyrene	129-00-0	3,900		37	7	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	223		7.15	2.43	5
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 09:48	Anita M Dale	43.68
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 13:21	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-021-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349800
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 13:21 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M03 SDG#: MHF32-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 13:21	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 13:21	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 12:10	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 19:19	Suzanne M Will	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-020-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349801
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 14:30 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
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32M04 SDG#: MHF32-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	39	J	300	30	53.14
10237	1,2-Dibromoethane	106-93-4	N.D.		300	61	53.14
10237	1,2-Dichloroethane	107-06-2	N.D.		300	61	53.14
10237	Ethylbenzene	100-41-4	N.D.		300	61	53.14
10237	Isopropylbenzene	98-82-8	420		300	61	53.14
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		300	30	53.14
10237	Toluene	108-88-3	N.D.		300	61	53.14
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		300	61	53.14
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		300	61	53.14
10237	Xylene (Total)	1330-20-7	72	J	300	61	53.14
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	3,700		96	19	5
10727	Benzo(a)anthracene	56-55-3	7,400		96	19	5
10727	Benzo(a)pyrene	50-32-8	7,800		96	19	5
10727	Benzo(b)fluoranthene	205-99-2	9,800		96	19	5
10727	Benzo(g,h,i)perylene	191-24-2	5,100		96	19	5
10727	Chrysene	218-01-9	7,700		96	19	5
10727	Fluorene	86-73-7	2,200		96	19	5
10727	Naphthalene	91-20-3	3,300		96	19	5
10727	Phenanthrene	85-01-8	13,000		96	19	5
10727	Pyrene	129-00-0	13,000		96	19	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	199		1.48	0.503	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	12.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161241AA	05/03/2016 11:23	Anita M Dale	53.14
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 14:30	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-020-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349801
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 14:30 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M04 SDG#: MHF32-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201612341021	05/02/2016 17:31	Lois E Hiltz	n.a.
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/09/2016 11:32	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:19	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-019-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349802
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 15:15 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M05 SDG#: MHF32-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	6	0.6	0.88
10237	1,2-Dibromoethane	106-93-4	N.D.	6	1	0.88
10237	1,2-Dichloroethane	107-06-2	N.D.	6	1	0.88
10237	Ethylbenzene	100-41-4	N.D.	6	1	0.88
10237	Isopropylbenzene	98-82-8	N.D.	6	1	0.88
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	6	0.6	0.88
10237	Toluene	108-88-3	N.D.	6	1	0.88
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	6	1	0.88
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	6	1	0.88
10237	Xylene (Total)	1330-20-7	N.D.	6	1	0.88

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,400	43	9	2
10727	Benzo(a)anthracene	56-55-3	1,200	43	9	2
10727	Benzo(a)pyrene	50-32-8	1,300	43	9	2
10727	Benzo(b)fluoranthene	205-99-2	1,500	43	9	2
10727	Benzo(g,h,i)perylene	191-24-2	1,400	43	9	2
10727	Chrysene	218-01-9	1,300	43	9	2
10727	Fluorene	86-73-7	590	43	9	2
10727	Naphthalene	91-20-3	7,700	43	9	2
10727	Phenanthrene	85-01-8	3,300	43	9	2
10727	Pyrene	129-00-0	1,600	43	9	2
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	2,920	6.89	2.34	5
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	22.8	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-019-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349802
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 15:15 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M05 SDG#: MHF32-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161231AA	05/02/2016 16:10	Jennifer K Howe	0.88
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 15:15	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 15:15	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 15:15	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 12:52	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	2	161185708004	05/05/2016 00:41	Elaine F Stoltzfus	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-DUP-Soil-001 Grab Soil
Philadelphia Refinery

LL Sample # SW 8349803
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 15:25 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M06 SDG#: MHF32-06FD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**	**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.	5	0.5	0.82
10237	1,2-Dibromoethane	106-93-4	N.D.	5	1	0.82
10237	1,2-Dichloroethane	107-06-2	N.D.	5	1	0.82
10237	Ethylbenzene	100-41-4	N.D.	5	1	0.82
10237	Isopropylbenzene	98-82-8	N.D.	5	1	0.82
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	0.5	0.82
10237	Toluene	108-88-3	N.D.	5	1	0.82
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.	5	1	0.82
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.	5	1	0.82
10237	Xylene (Total)	1330-20-7	N.D.	5	1	0.82
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,400	42	8	2
10727	Benzo(a)anthracene	56-55-3	1,300	42	8	2
10727	Benzo(a)pyrene	50-32-8	1,400	42	8	2
10727	Benzo(b)fluoranthene	205-99-2	1,700	42	8	2
10727	Benzo(g,h,i)perylene	191-24-2	1,500	42	8	2
10727	Chrysene	218-01-9	1,400	42	8	2
10727	Fluorene	86-73-7	610	42	8	2
10727	Naphthalene	91-20-3	8,300	42	8	2
10727	Phenanthrene	85-01-8	3,200	42	8	2
10727	Pyrene	129-00-0	1,600	42	8	2
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	6,690	6.87	2.34	5
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	20.3	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	A161201AA	04/29/2016 16:21	Jennifer K Howe	0.82
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 15:25	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 15:25	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-DUP-Soil-001 Grab Soil
Philadelphia Refinery

LL Sample # SW 8349803
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 15:25 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M06 SDG#: MHF32-06FD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 15:25	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 13:12	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 19:23	Suzanne M Will	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-019-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349804
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 15:30 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M07 SDG#: MHF32-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2	J	6	0.6	0.87
10237	1,2-Dibromoethane	106-93-4	N.D.		6	1	0.87
10237	1,2-Dichloroethane	107-06-2	N.D.		6	1	0.87
10237	Ethylbenzene	100-41-4	N.D.		6	1	0.87
10237	Isopropylbenzene	98-82-8	2	J	6	1	0.87
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		6	0.6	0.87
10237	Toluene	108-88-3	2	J	6	1	0.87
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		6	1	0.87
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		6	1	0.87
10237	Xylene (Total)	1330-20-7	N.D.		6	1	0.87

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	390		45	9	2
10727	Benzo(a)anthracene	56-55-3	1,400		45	9	2
10727	Benzo(a)pyrene	50-32-8	1,400		45	9	2
10727	Benzo(b)fluoranthene	205-99-2	1,700		45	9	2
10727	Benzo(g,h,i)perylene	191-24-2	880		45	9	2
10727	Chrysene	218-01-9	1,400		45	9	2
10727	Fluorene	86-73-7	200		45	9	2
10727	Naphthalene	91-20-3	1,500		45	9	2
10727	Phenanthrene	85-01-8	1,100		45	9	2
10727	Pyrene	129-00-0	1,400		45	9	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	1,370		8.25	2.81	5
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.9		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-019-2-4-Soil Grab Soil Philadelphia Refinery

LL Sample # SW 8349804
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 15:30 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M07 SDG#: MHF32-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	A161201AA	04/29/2016 16:43	Jennifer K Howe	0.87
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 15:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 15:30	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 15:30	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 13:33	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 19:26	Suzanne M Will	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-004-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349805
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 16:15 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M08 SDG#: MHF32-08

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1	J	5	0.5	0.82
10237	1,2-Dibromoethane	106-93-4	N.D.		5	0.9	0.82
10237	1,2-Dichloroethane	107-06-2	N.D.		5	0.9	0.82
10237	Ethylbenzene	100-41-4	N.D.		5	0.9	0.82
10237	Isopropylbenzene	98-82-8	N.D.		5	0.9	0.82
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.82
10237	Toluene	108-88-3	3	J	5	0.9	0.82
10237	1,2,4-Trimethylbenzene	95-63-6	0.9	J	5	0.9	0.82
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	0.9	0.82
10237	Xylene (Total)	1330-20-7	4	J	5	0.9	0.82
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	430		39	8	2
10727	Benzo(a)anthracene	56-55-3	1,100		39	8	2
10727	Benzo(a)pyrene	50-32-8	1,100		39	8	2
10727	Benzo(b)fluoranthene	205-99-2	1,300		39	8	2
10727	Benzo(g,h,i)perylene	191-24-2	700		39	8	2
10727	Chrysene	218-01-9	1,100		39	8	2
10727	Fluorene	86-73-7	160		39	8	2
10727	Naphthalene	91-20-3	1,200		39	8	2
10727	Phenanthrene	85-01-8	1,100		39	8	2
10727	Pyrene	129-00-0	1,300		39	8	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	399		1.21	0.411	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	13.2		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161202AA	04/30/2016 04:07	Sara E Johnson	0.82
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 16:15	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 16:15	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-004-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349805
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 16:15 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M08 SDG#: MHF32-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 16:15	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 13:54	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:33	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-DUP-Soil-002 Grab Soil
Philadelphia Refinery

LL Sample # SW 8349806
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 16:25 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M09 SDG#: MHF32-09FD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2	J	5	0.5	0.89
10237	1,2-Dibromoethane	106-93-4	N.D.		5	1	0.89
10237	1,2-Dichloroethane	107-06-2	N.D.		5	1	0.89
10237	Ethylbenzene	100-41-4	1	J	5	1	0.89
10237	Isopropylbenzene	98-82-8	N.D.		5	1	0.89
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.89
10237	Toluene	108-88-3	3	J	5	1	0.89
10237	1,2,4-Trimethylbenzene	95-63-6	2	J	5	1	0.89
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	1	0.89
10237	Xylene (Total)	1330-20-7	5	J	5	1	0.89

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and the QC is again outside of the acceptance limits, indicating a matrix effect. The data is reported from the initial trial.

GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	600		39	8	2
10727	Benzo(a)anthracene	56-55-3	1,700		39	8	2
10727	Benzo(a)pyrene	50-32-8	1,500		39	8	2
10727	Benzo(b)fluoranthene	205-99-2	1,900		39	8	2
10727	Benzo(g,h,i)perylene	191-24-2	940		39	8	2
10727	Chrysene	218-01-9	1,700		39	8	2
10727	Fluorene	86-73-7	190		39	8	2
10727	Naphthalene	91-20-3	1,300		39	8	2
10727	Phenanthrene	85-01-8	1,700		39	8	2
10727	Pyrene	129-00-0	2,300		39	8	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	529		1.33	0.452	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	12.5		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-DUP-Soil-002 Grab Soil
Philadelphia Refinery

LL Sample # SW 8349806
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 16:25 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M09 SDG#: MHF32-09FD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161231AA	05/02/2016 16:34	Jennifer K Howe	0.89
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 16:25	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 16:25	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 16:25	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 14:14	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:37	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-004-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349807
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 16:36 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M10 SDG#: MHF32-10

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1	J	5	0.5	0.81
10237	1,2-Dibromoethane	106-93-4	N.D.		5	0.9	0.81
10237	1,2-Dichloroethane	107-06-2	N.D.		5	0.9	0.81
10237	Ethylbenzene	100-41-4	N.D.		5	0.9	0.81
10237	Isopropylbenzene	98-82-8	N.D.		5	0.9	0.81
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	0.5	0.81
10237	Toluene	108-88-3	2	J	5	0.9	0.81
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		5	0.9	0.81
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		5	0.9	0.81
10237	Xylene (Total)	1330-20-7	1	J	5	0.9	0.81
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	550		38	7	2
10727	Benzo(a)anthracene	56-55-3	1,600		38	7	2
10727	Benzo(a)pyrene	50-32-8	1,500		38	7	2
10727	Benzo(b)fluoranthene	205-99-2	1,700		38	7	2
10727	Benzo(g,h,i)perylene	191-24-2	840		38	7	2
10727	Chrysene	218-01-9	1,500		38	7	2
10727	Fluorene	86-73-7	200		38	7	2
10727	Naphthalene	91-20-3	1,100		38	7	2
10727	Phenanthrene	85-01-8	1,200		38	7	2
10727	Pyrene	129-00-0	1,900		38	7	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	189		1.17	0.398	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	11.0		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	X161231AA	05/02/2016 16:57	Jennifer K Howe	0.81
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 16:36	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/21/2016 16:36	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-004-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349807
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/21/2016 16:36 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M10 SDG#: MHF32-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/21/2016 16:36	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 14:35	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:41	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-006-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349808
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 09:40 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M11 SDG#: MHF32-11

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	N.D.		280	28	47.13
10237	1,2-Dibromoethane	106-93-4	N.D.		280	55	47.13
10237	1,2-Dichloroethane	107-06-2	N.D.		280	55	47.13
10237	Ethylbenzene	100-41-4	N.D.		280	55	47.13
10237	Isopropylbenzene	98-82-8	N.D.		280	55	47.13
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		280	28	47.13
10237	Toluene	108-88-3	88	J	280	55	47.13
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		280	55	47.13
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		280	55	47.13
10237	Xylene (Total)	1330-20-7	63	J	280	55	47.13
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	700		39	8	2
10727	Benzo(a)anthracene	56-55-3	1,200		39	8	2
10727	Benzo(a)pyrene	50-32-8	1,200		39	8	2
10727	Benzo(b)fluoranthene	205-99-2	1,300		39	8	2
10727	Benzo(g,h,i)perylene	191-24-2	760		39	8	2
10727	Chrysene	218-01-9	1,300		39	8	2
10727	Fluorene	86-73-7	360		39	8	2
10727	Naphthalene	91-20-3	1,600		39	8	2
10727	Phenanthrene	85-01-8	1,500		39	8	2
10727	Pyrene	129-00-0	2,000		39	8	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	142		1.50	0.510	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	14.5		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 11:19	Anita M Dale	47.13
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 09:40	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-006-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349808
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 09:40 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M11 SDG#: MHF32-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/22/2016 09:40	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/22/2016 09:40	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 14:55	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:44	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-006-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349809
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 09:52 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M12 SDG#: MHF32-12

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	23	J	220	22	39.18
10237	1,2-Dibromoethane	106-93-4	N.D.		220	44	39.18
10237	1,2-Dichloroethane	107-06-2	N.D.		220	44	39.18
10237	Ethylbenzene	100-41-4	N.D.		220	44	39.18
10237	Isopropylbenzene	98-82-8	N.D.		220	44	39.18
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		220	22	39.18
10237	Toluene	108-88-3	73	J	220	44	39.18
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		220	44	39.18
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		220	44	39.18
10237	Xylene (Total)	1330-20-7	65	J	220	44	39.18
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	430		38	7	2
10727	Benzo(a)anthracene	56-55-3	750		38	7	2
10727	Benzo(a)pyrene	50-32-8	740		38	7	2
10727	Benzo(b)fluoranthene	205-99-2	1,000		38	7	2
10727	Benzo(g,h,i)perylene	191-24-2	520		38	7	2
10727	Chrysene	218-01-9	820		38	7	2
10727	Fluorene	86-73-7	270		38	7	2
10727	Naphthalene	91-20-3	1,600		38	7	2
10727	Phenanthrene	85-01-8	1,100		38	7	2
10727	Pyrene	129-00-0	1,200		38	7	2
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	225		1.28	0.435	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	11.8		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 11:42	Anita M Dale	39.18
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 09:52	Client Supplied	1

*=This limit was used in the evaluation of the final result

Sample Description: AOI6-BH16-006-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349809
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 09:52 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M12 SDG#: MHF32-12

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/22/2016 09:52	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/22/2016 09:52	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 15:16	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:54	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-025-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349810
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 12:10 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M13 SDG#: MHF32-13

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2,700		220	22	40.78
10237	1,2-Dibromoethane	106-93-4	N.D.		220	45	40.78
10237	1,2-Dichloroethane	107-06-2	N.D.		220	45	40.78
10237	Ethylbenzene	100-41-4	120	J	220	45	40.78
10237	Isopropylbenzene	98-82-8	2,900		220	45	40.78
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		220	22	40.78
10237	Toluene	108-88-3	900		220	45	40.78
10237	1,2,4-Trimethylbenzene	95-63-6	95	J	220	45	40.78
10237	1,3,5-Trimethylbenzene	108-67-8	45	J	220	45	40.78
10237	Xylene (Total)	1330-20-7	530		220	45	40.78
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	4,400		92	18	5
10727	Benzo(a)anthracene	56-55-3	3,200		92	18	5
10727	Benzo(a)pyrene	50-32-8	2,300		92	18	5
10727	Benzo(b)fluoranthene	205-99-2	2,800		92	18	5
10727	Benzo(g,h,i)perylene	191-24-2	930		92	18	5
10727	Chrysene	218-01-9	2,800		92	18	5
10727	Fluorene	86-73-7	4,200		92	18	5
10727	Naphthalene	91-20-3	460		92	18	5
10727	Phenanthrene	85-01-8	13,000		92	18	5
10727	Pyrene	129-00-0	5,600		92	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	10.3		1.37	0.465	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.7		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 12:04	Anita M Dale	40.78
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 12:10	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/22/2016 12:10	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-025-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349810
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 12:10 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
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Suite #3
Niagara Falls NY 14304

32M13 SDG#: MHF32-13

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/22/2016 12:10	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/09/2016 11:53	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 18:58	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-025-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349811
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 12:40 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
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Niagara Falls NY 14304

32M14 SDG#: MHF32-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	1,400,000		24,000	2,400	4389.76
10237	1,2-Dibromoethane	106-93-4	N.D.		24,000	4,800	4389.76
10237	1,2-Dichloroethane	107-06-2	N.D.		24,000	4,800	4389.76
10237	Ethylbenzene	100-41-4	61,000		24,000	4,800	4389.76
10237	Isopropylbenzene	98-82-8	2,200,000		240,000	48,000	43897.64
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		24,000	2,400	4389.76
10237	Toluene	108-88-3	640,000		24,000	4,800	4389.76
10237	1,2,4-Trimethylbenzene	95-63-6	50,000		24,000	4,800	4389.76
10237	1,3,5-Trimethylbenzene	108-67-8	18,000	J	24,000	4,800	4389.76
10237	Xylene (Total)	1330-20-7	340,000		24,000	4,800	4389.76
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,200		19	4	1
10727	Benzo(a)anthracene	56-55-3	1,100		19	4	1
10727	Benzo(a)pyrene	50-32-8	690		19	4	1
10727	Benzo(b)fluoranthene	205-99-2	1,000		19	4	1
10727	Benzo(g,h,i)perylene	191-24-2	330		19	4	1
10727	Chrysene	218-01-9	970		19	4	1
10727	Fluorene	86-73-7	850		19	4	1
10727	Naphthalene	91-20-3	2,000		19	4	1
10727	Phenanthrene	85-01-8	4,100		19	4	1
10727	Pyrene	129-00-0	2,100		19	4	1
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	64.3		1.12	0.382	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 15:06	Anita M Dale	4389.76
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161231AA	05/02/2016 13:40	Anita M Dale	43897.64
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 12:40	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-025-2-4-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349811
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 12:40 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M14 SDG#: MHF32-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/22/2016 12:40	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 15:57	Linda M Hartenstine	1
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 19:02	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

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Analysis Report

Sample Description: AOI6-BH16-DUP-04-22-16-003 Grab Soil
Philadelphia Refinery

LL Sample # SW 8349812
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 12:20 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M15 SDG#: MHF32-15FD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	2,600		210	21	38.88
10237	1,2-Dibromoethane	106-93-4	N.D.		210	43	38.88
10237	1,2-Dichloroethane	107-06-2	N.D.		210	43	38.88
10237	Ethylbenzene	100-41-4	110	J	210	43	38.88
10237	Isopropylbenzene	98-82-8	2,600		210	43	38.88
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		210	21	38.88
10237	Toluene	108-88-3	750		210	43	38.88
10237	1,2,4-Trimethylbenzene	95-63-6	96	J	210	43	38.88
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		210	43	38.88
10237	Xylene (Total)	1330-20-7	480		210	43	38.88
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	4,900		92	18	5
10727	Benzo(a)anthracene	56-55-3	3,800		92	18	5
10727	Benzo(a)pyrene	50-32-8	2,700		92	18	5
10727	Benzo(b)fluoranthene	205-99-2	3,200		92	18	5
10727	Benzo(g,h,i)perylene	191-24-2	1,000		92	18	5
10727	Chrysene	218-01-9	3,200		92	18	5
10727	Fluorene	86-73-7	4,400		92	18	5
10727	Naphthalene	91-20-3	480		92	18	5
10727	Phenanthrene	85-01-8	14,000		92	18	5
10727	Pyrene	129-00-0	6,600		92	18	5
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	10.2		1.41	0.480	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 12:27	Anita M Dale	38.88
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 12:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/22/2016 12:20	Client Supplied	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-DUP-04-22-16-003 Grab Soil
Philadelphia Refinery

LL Sample # SW 8349812
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 12:20 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M15 SDG#: MHF32-15FD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/22/2016 12:20	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/09/2016 12:13	Linda M Hartenstine	5
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 19:05	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH16-026-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349813
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 14:35 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M16 SDG#: MHF32-16

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/kg**		**ug/kg**	**ug/kg**	
10237	Benzene	71-43-2	7,600		220	22	40.06
10237	1,2-Dibromoethane	106-93-4	N.D.		220	44	40.06
10237	1,2-Dichloroethane	107-06-2	N.D.		220	44	40.06
10237	Ethylbenzene	100-41-4	82	J	220	44	40.06
10237	Isopropylbenzene	98-82-8	1,800		220	44	40.06
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		220	22	40.06
10237	Toluene	108-88-3	N.D.		220	44	40.06
10237	1,2,4-Trimethylbenzene	95-63-6	N.D.		220	44	40.06
10237	1,3,5-Trimethylbenzene	108-67-8	N.D.		220	44	40.06
10237	Xylene (Total)	1330-20-7	92	J	220	44	40.06
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	710		74	15	2
10727	Benzo(a)anthracene	56-55-3	1,300		74	15	2
10727	Benzo(a)pyrene	50-32-8	1,300		74	15	2
10727	Benzo(b)fluoranthene	205-99-2	890		74	15	2
10727	Benzo(g,h,i)perylene	191-24-2	720		74	15	2
10727	Chrysene	218-01-9	2,200		74	15	2
10727	Fluorene	86-73-7	510		74	15	2
10727	Naphthalene	91-20-3	1,100		74	15	2
10727	Phenanthrene	85-01-8	1,900		74	15	2
10727	Pyrene	129-00-0	2,100		74	15	2
	Reporting limits were raised due to interference from the sample matrix.						
Metals	**SW-846 6010B**		**mg/kg**		**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	61.8		1.19	0.405	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.8		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	VOCs- Solid by 8260B	SW-846 8260B	1	Q161211AA	04/30/2016 12:49	Anita M Dale	40.06
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201611640932	04/21/2016 14:35	Client Supplied	1

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Analysis Report

Sample Description: AOI6-BH16-026-0-2-Soil Grab Soil
Philadelphia Refinery

LL Sample # SW 8349813
LL Group # 1653975
Account # 10177

Project Name: Philadelphia Refinery

Collected: 04/22/2016 14:35 by AC

Submitted: 04/25/2016 16:00
Reported: 05/11/2016 23:02

Conestoga-Rovers & Associates
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

32M16 SDG#: MHF32-16

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201611640932	04/22/2016 14:35	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201611640932	04/22/2016 14:35	Client Supplied	1
10727	TCL 8270 (microwave)	SW-846 8270C	1	16121SLH026	05/08/2016 16:38	Linda M Hartenstine	2
10809	BNA Soil Microwave	SW-846 3546	1	16121SLH026	05/03/2016 02:00	Sherry L Morrow	1
06955	Lead	SW-846 6010B	1	161185708004	04/29/2016 19:09	Suzanne M Will	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	161185708004	04/28/2016 22:36	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16118820008B	04/27/2016 20:40	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: A161201AA	Sample number(s): 8349799,8349803-8349804		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: Q161211AA	Sample number(s): 8349798,8349800,8349808-8349813		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: Q161231AA	Sample number(s): 8349811		
Isopropylbenzene	N.D.	250	50
Batch number: Q161241AA	Sample number(s): 8349801		
Benzene	N.D.	250	25
1,2-Dibromoethane	N.D.	250	50
1,2-Dichloroethane	N.D.	250	50
Ethylbenzene	N.D.	250	50
Isopropylbenzene	N.D.	250	50
Methyl Tertiary Butyl Ether	N.D.	250	25
Toluene	N.D.	250	50
1,2,4-Trimethylbenzene	N.D.	250	50
1,3,5-Trimethylbenzene	N.D.	250	50
Xylene (Total)	N.D.	250	50
Batch number: X161202AA	Sample number(s): 8349805		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: X161231AA	Sample number(s): 8349802,8349806-8349807		
Benzene	N.D.	5	0.5
1,2-Dibromoethane	N.D.	5	1
1,2-Dichloroethane	N.D.	5	1
Ethylbenzene	N.D.	5	1
Isopropylbenzene	N.D.	5	1
Methyl Tertiary Butyl Ether	N.D.	5	0.5
Toluene	N.D.	5	1
1,2,4-Trimethylbenzene	N.D.	5	1
1,3,5-Trimethylbenzene	N.D.	5	1
Xylene (Total)	N.D.	5	1
Batch number: 16121SLH026	Sample number(s): 8349798,8349800-8349813		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3
	mg/kg	mg/kg	mg/kg
Batch number: 161185708004	Sample number(s): 8349798,8349800-8349813		
Lead	N.D.	1.50	0.510

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: A161201AA	Sample number(s): 8349799,8349803-8349804								
Benzene	20	18.27	20	18	91	90	80-120	1	30
1,2-Dibromoethane	20	18.19	20	17.75	91	89	80-120	2	30
1,2-Dichloroethane	20	15.82	20	15.69	79	78	77-130	1	30
Ethylbenzene	20	18.08	20	17.88	90	89	80-120	1	30
Isopropylbenzene	20	17.65	20	17.44	88	87	70-120	1	30
Methyl Tertiary Butyl Ether	20	17.12	20	16.89	86	84	72-120	1	30
Toluene	20	18.43	20	18.2	92	91	80-120	1	30
1,2,4-Trimethylbenzene	20	17.83	20	17.79	89	89	74-120	0	30
1,3,5-Trimethylbenzene	20	17.61	20	17.58	88	88	73-120	0	30

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Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Xylene (Total)	60	53.78	60	52.89	90	88	80-120	2	30
Batch number: Q161211AA	Sample number(s): 8349798,8349800,8349808-8349813								
Benzene	1000	970.37	1000	975.51	97	98	80-120	1	30
1,2-Dibromoethane	1000	994.37	1000	960.74	99	96	80-120	3	30
1,2-Dichloroethane	1000	979.05	1000	973.1	98	97	77-130	1	30
Ethylbenzene	1000	953.94	1000	941.84	95	94	80-120	1	30
Isopropylbenzene	1000	993.71	1000	959.52	99	96	70-120	4	30
Methyl Tertiary Butyl Ether	1000	984.63	1000	974.29	98	97	72-120	1	30
Toluene	1000	995.97	1000	977.96	100	98	80-120	2	30
1,2,4-Trimethylbenzene	1000	991.95	1000	979.09	99	98	74-120	1	30
1,3,5-Trimethylbenzene	1000	992.04	1000	990.89	99	99	73-120	0	30
Xylene (Total)	3000	2890.55	3000	2859.01	96	95	80-120	1	30
Batch number: Q161231AA	Sample number(s): 8349811								
Isopropylbenzene	1000	1012.33	1000	948.5	101	95	70-120	7	30
Batch number: Q161241AA	Sample number(s): 8349801								
Benzene	1000	1088.87	1000	993.84	109	99	80-120	9	30
1,2-Dibromoethane	1000	1066.12	1000	953.64	107	95	80-120	11	30
1,2-Dichloroethane	1000	1102.1	1000	999.79	110	100	77-130	10	30
Ethylbenzene	1000	1060.2	1000	931.71	106	93	80-120	13	30
Isopropylbenzene	1000	1078.82	1000	942.98	108	94	70-120	13	30
Methyl Tertiary Butyl Ether	1000	1110.01	1000	992.58	111	99	72-120	11	30
Toluene	1000	1088	1000	978.57	109	98	80-120	11	30
1,2,4-Trimethylbenzene	1000	1106.43	1000	982.88	111	98	74-120	12	30
1,3,5-Trimethylbenzene	1000	1110.86	1000	976.76	111	98	73-120	13	30
Xylene (Total)	3000	3159.04	3000	2820.72	105	94	80-120	11	30
Batch number: X161202AA	Sample number(s): 8349805								
Benzene	20	20.51	20	20.58	103	103	80-120	0	30
1,2-Dibromoethane	20	18.38	20	18.36	92	92	80-120	0	30
1,2-Dichloroethane	20	21.04	20	21.17	105	106	77-130	1	30
Ethylbenzene	20	20.13	20	20.03	101	100	80-120	0	30
Isopropylbenzene	20	19.62	20	19.42	98	97	70-120	1	30
Methyl Tertiary Butyl Ether	20	17.65	20	18.1	88	91	72-120	3	30
Toluene	20	20.08	20	20	100	100	80-120	0	30
1,2,4-Trimethylbenzene	20	18.95	20	18.6	95	93	74-120	2	30
1,3,5-Trimethylbenzene	20	18.74	20	18.68	94	93	73-120	0	30
Xylene (Total)	60	58.22	60	57.49	97	96	80-120	1	30
Batch number: X161231AA	Sample number(s): 8349802,8349806-8349807								
Benzene	20	20.98	20	18.68	105	93	80-120	12	30
1,2-Dibromoethane	20	18.79	20	17.84	94	89	80-120	5	30
1,2-Dichloroethane	20	21.83	20	20.29	109	101	77-130	7	30
Ethylbenzene	20	20.23	20	18.08	101	90	80-120	11	30
Isopropylbenzene	20	19.54	20	17.35	98	87	70-120	12	30
Methyl Tertiary Butyl Ether	20	18.62	20	17.66	93	88	72-120	5	30
Toluene	20	20.26	20	18.11	101	91	80-120	11	30
1,2,4-Trimethylbenzene	20	18.7	20	16.91	94	85	74-120	10	30
1,3,5-Trimethylbenzene	20	18.55	20	16.69	93	83	73-120	11	30
Xylene (Total)	60	58.03	60	52.26	97	87	80-120	10	30

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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16121SLH026	Sample number(s): 8349798,8349800-8349813								
Anthracene	1666.67	1605.58			96		82-118		
Benzo(a)anthracene	1666.67	1551.14			93		76-119		
Benzo(a)pyrene	1666.67	1592.87			96		85-117		
Benzo(b)fluoranthene	1666.67	1442.61			87		78-129		
Benzo(g,h,i)perylene	1666.67	1345.71			81		77-118		
Chrysene	1666.67	1538.74			92		80-121		
Fluorene	1666.67	1509.98			91		86-118		
Naphthalene	1666.67	1496.04			90		82-112		
Phenanthrene	1666.67	1554.46			93		80-114		
Pyrene	1666.67	1534.29			92		81-114		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161185708004	Sample number(s): 8349798,8349800-8349813								
Lead	15	16.28			109		80-120		
	%	%	%	%					
Batch number: 16118820008B	Sample number(s): 8349798,8349800-8349813								
Moisture	89.5	89.45			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: Q161241AA	Sample number(s): 8349801 UNSPK: P353503									
Benzene	N.D.	1869.16	1739.53	1587.3	1753.33	93	110	80-120	1	30
1,2-Dibromoethane	N.D.	1869.16	1649.97	1587.3	1707.18	88	108	80-120	3	30
1,2-Dichloroethane	N.D.	1869.16	1746.94	1587.3	1756.64	93	111	77-130	1	30
Ethylbenzene	N.D.	1869.16	1661.44	1587.3	1677.39	89	106	80-120	1	30
Isopropylbenzene	N.D.	1869.16	1677.77	1587.3	1704.64	90	107	70-120	2	30
Methyl Tertiary Butyl Ether	N.D.	1869.16	1770.17	1587.3	1709.9	95	108	72-120	3	30
Toluene	N.D.	1869.16	1724.54	1587.3	1751.63	92	110	80-120	2	30
1,2,4-Trimethylbenzene	N.D.	1869.16	1710.61	1587.3	1769.72	92	111	74-120	3	30
1,3,5-Trimethylbenzene	N.D.	1869.16	1715.32	1587.3	1789.09	92	113	73-120	4	30
Xylene (Total)	N.D.	5607.47	5002.28	4761.91	5074.93	89	107	80-120	1	30
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16121SLH026	Sample number(s): 8349798,8349800-8349813 UNSPK: 8349798									
Anthracene	1396.86	1655.63	3108.67	1655.63	2776.99	103	83	82-118	11	30
Benzo(a)anthracene	827.56	1655.63	2693.22	1655.63	2393.46	113	95	76-119	12	30
Benzo(a)pyrene	1096.06	1655.63	2850	1655.63	2587.16	106	90	85-117	10	30

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P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Benzo(b)fluoranthene	1190.14	1655.63	2791.17	1655.63	2455.28	97	76*	78-129	13	30
Benzo(g,h,i)perylene	1174.93	1655.63	2813.62	1655.63	2443.89	99	77	77-118	14	30
Chrysene	951.16	1655.63	2659.82	1655.63	2447.18	103	90	80-121	8	30
Fluorene	1241.16	1655.63	2765.22	1655.63	2865.31	92	98	86-118	4	30
Naphthalene	7669.28	1655.63	9093.46	1655.63	8005.63	86 (2)	20 (2)	82-112	13	30
Phenanthrene	3157.08	1655.63	4910.47	1655.63	4490.56	106	81	80-114	9	30
Pyrene	1553.85	1655.63	3502.82	1655.63	2915.1	118*	82	81-114	18	30
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161185708004	Sample number(s): 8349798,8349800-8349813 UNSPK: P352281									
Lead	6.56	14.71	18.67	14.42	19.93	82	93	75-125	7	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161185708004	Sample number(s): 8349798,8349800-8349813 BKG: P352281			
Lead	6.56	5.05	26* (1)	20
	%	%		
Batch number: 16118820008B	Sample number(s): 8349798,8349800-8349813 BKG: 8349798			
Moisture	34.95	34.08	3	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- Solid by 8260B
Batch number: A161201AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8349799	98	105	101	93
8349803	98	109	97	81
8349804	96	102	113	79
Blank	95	101	100	91
LCS	94	100	102	100
LCSD	93	97	103	98
Limits:	50-141	54-135	52-141	50-131

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs- Solid by 8260B
Batch number: Q161211AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8349798	72	70	64	73
8349800	83	89	90	92
8349808	90	90	87	86
8349809	78	79	77	76
8349810	97	99	96	97
8349811	84	55	111	216*
8349812	91	92	92	91
8349813	96	97	96	97
Blank	93	96	92	90
LCS	91	92	92	90
LCSD	91	91	90	89
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: Q161241AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8349801	88	91	94	99
Blank	91	95	92	91
LCS	97	102	98	96
LCSD	87	87	87	86
MS	90	89	91	89
MSD	100	103	101	99
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161202AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8349805	100	102	104	89
Blank	102	101	100	96
LCS	101	96	103	100
LCSD	101	98	101	99
Limits:	50-141	54-135	52-141	50-131

Analysis Name: VOCs- Solid by 8260B
Batch number: X161231AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8349802	104	107	98	98
8349806	102	101	111	82
8349807	102	101	105	91
Blank	103	98	101	95
LCS	103	98	102	100
LCSD	103	98	102	100

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Conestoga-Rovers & Associates
Reported: 05/11/2016 23:02

Group Number: 1653975

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Limits: 50-141 54-135 52-141 50-131

Analysis Name: TCL 8270 (microwave)
Batch number: 16121SLH026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8349798	92	76	82
8349800	98	88	91
8349801	109	88	93
8349802	92	90	87
8349803	94	90	89
8349804	87	85	86
8349805	96	93	94
8349806	96	90	91
8349807	105	100	102
8349808	102	89	92
8349809	97	91	92
8349810	103	99	104
8349811	108	89	96
8349812	95	92	101
8349813	96	90	84
Blank	91	85	94
LCS	94	91	98
MS	103	72	88
MSD	96	74	74
Limits:	54-123	63-117	59-129

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1653975 Sample # ~~834470~~ 8349798-813 COC # 496122

Client Information

Client: Evergreen 10177

Acct. #:

Project Name/#: Evergreen Philly 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Connor

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix

Sediment ☐ Soil ☒ Water: Ground ☐ Potable ☐ Surface ☐ NPDES ☐ Other: ____

Analysis Requested / Preservation Codes

For Lab Use Only
FSC:
SCR#:

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	VOC	Moisture (Lead) Select VOC	Remarks
AOI6-BH16-023-0-2-Soil	4/21/16	1210	X		5			5	4	1	
AOI6-TB-BH16-04/21/16		1248	X					3			trip blank
AOI6-BH16-021-0-2-Soil		1321	X		X			5	4	1	
AOI6-BH16-020-0-2-Soil		1430	X		5			5	4	1	
AOI6-BH16-019-0-2-Soil		1515	X		5			5	4	1	
AOI6-BH16-DUP-Soil-001		1525	X		5			5	4	1	
AOI6-BH16-019-2-4-Soil		1530	X		5			5	4	1	
AOI6-BH16-004-0-2-Soil		1615	X		5			5	4	1	
AOI6-BH16-DUP-Soil-002		1625	X		5			5	4	1	
AOI6-BH16-004-2-4-Soil		1636	X		5			5	4	1	

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

1 of 2

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Alissa Conn	4/22/16	1800	[illegible]	4/25/16	0905
[illegible]	4/25/16	1600			
			[illegible]	4/25/16	1600

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.5 °C

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1653975 Sample # 8349798-813

COC # 496121

Client Information

Client: Evergreen 10177

Acct. #:

Project Name/#: Evergreen Philly 1110913

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix

Sediment ☐ Soil ☒ Water: Ground ☐ Potable ☐ Surface ☐ NPDES ☐ Other: ____

Analysis Requested / Preservation Codes

For Lab Use Only

FSC: ____

SCR#: ____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

2 of 2

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Total # of Containers	VOCs	Moisture, Lead, Selectivity	
AOI6-BH16-006-0-2-soil	4/22/16	0940	X		5	5	4	1	
AOI6-BH16-006-2-4-soil		0952	X		5	5	4	1	
AOI6-BH16-025-0-2-soil		1210	X		5	5	4	1	
~~AOI6-BH16-TB-04-22-16-003~~		~~1220~~	~~X~~		~~5~~	~~5~~	~~4~~	~~1~~	AC
AOI6-BH16-025-2-4-soil		1240	X		5	5	4	1	
AOI6-BH16-DUP-04-22-16-003		1220	X		5	5	4	1	
AOI6-BH16-026-0-2-soil			X		5	5	4	1	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Alissa Cannon	4/22/16	1800	[signature]	4-25-16	0900
[signature]	4-25-16	1600			
			[signature]	4/25/16	1600

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.5 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 144126

Group Number(s): 1653975

Client: Stantec

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	04/25/2016 16:00
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	No
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	3
Samples Intact:	Yes	Trip Blank Type:	See Below
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Trip Blank Type(s): 1-MeOH, 2-NaHSO4

Unpacked by Patrick Engle (3472) at 17:28 on 04/25/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.5	DT	Wet	Y	Bagged	N
2	DT121	0.5	DT	Wet	Y	Bagged	N

Sample Date/Time Discrepancy Details

Sample ID on COC	Date/Time on Label	Comments
AOI6-BH16-006-2-4-Soil	4/22/2016 09:50	Time = 0952 on COC
AOI6-BH16-025-2-4-Soil	4/22/2016 12:41	Time = 1240 on COC
AOI6-BH16-026-0-2-Soil	4/22/2016 14:35	No Time of Collection on COC
AOI6-BH16-026-0-2-Soil	4/21/2016 14:35	Date = 4/22/16 on COC

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Lancaster, PA 17605-2425
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: May 17, 2016

Project: Philadelphia Refinery

Submittal Date: 05/05/2016
Group Number: 1657425
SDG: MHF33
PO Number: 34004491
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
GW-11109613-B134D-05-03-16-AC-001 Grab Groundwater	8365504
GW-11109613-B132D-05-03-16-RM-002 Grab Groundwater	8365505
GW-11109613-DUP1-05-03-16-AC-003 Grab Groundwater	8365506
GW-11109613-B133D-05-03-16-RM-004 Grab Groundwater	8365507
GW-11109613-B48D-05-03-16-AC-005 Grab Groundwater	8365508
GW-11109613-B116-05-04-16-RM-006 Grab Groundwater	8365509
GW-11109613-B115-05-04-16-AC-007 Grab Groundwater	8365510
GW-11109613-B117-05-04-16-AC-008 Grab Groundwater	8365511
GW-11109613-B168-05-04-16-AC-009 Grab Groundwater	8365512
GW-11109613-B153-05-04-16-RM-010 Grab Groundwater	8365513
TB-11109613-05-04-16-RM-011 Water	8365514

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Lancaster Laboratories Environmental
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Analysis Report

Sample Description: GW-11109613-B134D-05-03-16-AC-001 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8365504
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 13:10 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B134D SDG#: MHF33-01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	2	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.069	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.051	0.010	1
08357	Chrysene	218-01-9	N.D.	0.051	0.010	1
08357	Fluorene	86-73-7	0.012 J	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.030	1
08357	Phenanthrene	85-01-8	0.27	0.061	0.030	1
08357	Pyrene	129-00-0	0.017 J	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00014 J	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 19:57	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 19:57	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/14/2016 18:39	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 13:31	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:32	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B134D-05-03-16-AC-001 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365504
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 13:10 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B134D SDG#: MHF33-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B132D-05-03-16-RM-002 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8365505
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 12:00 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B132D SDG#: MHF33-02

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	2		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.088		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.018	J	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.017	J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.018	J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.013	J	0.051	0.010	1
08357	Chrysene	218-01-9	0.015	J	0.051	0.010	1
08357	Fluorene	86-73-7	0.018	J	0.051	0.010	1
08357	Naphthalene	91-20-3	0.082		0.061	0.030	1
08357	Phenanthrene	85-01-8	0.18		0.061	0.030	1
08357	Pyrene	129-00-0	0.033	J	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0094	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 21:05	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 21:05	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 00:06	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 13:46	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:34	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B132D-05-03-16-RM-002 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8365505
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 12:00 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B132D SDG#: MHF33-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-DUP1-05-03-16-AC-003 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365506
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 13:30 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

--D1- SDG#: MHF33-03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	1	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.039 J	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.011 J	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.012 J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.013 J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.017 J	0.051	0.010	1
08357	Chrysene	218-01-9	N.D.	0.051	0.010	1
08357	Fluorene	86-73-7	0.011 J	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.030	1
08357	Phenanthrene	85-01-8	0.27	0.061	0.030	1
08357	Pyrene	129-00-0	0.020 J	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00014 J	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 21:28	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 21:28	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 00:35	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 14:02	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:35	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-DUP1-05-03-16-AC-003 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365506
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 13:30 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

--D1- SDG#: MHF33-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B133D-05-03-16-RM-004 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8365507
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 15:45 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B133D SDG#: MHF33-04

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	1	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.18	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.024 J	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.017 J	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.015 J	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.010 J	0.050	0.010	1
08357	Chrysene	218-01-9	0.021 J	0.050	0.010	1
08357	Fluorene	86-73-7	0.030 J	0.050	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.060	0.030	1
08357	Phenanthrene	85-01-8	0.49	0.060	0.030	1
08357	Pyrene	129-00-0	0.047 J	0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0014	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 21:51	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 21:51	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 01:05	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 14:17	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:37	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B133D-05-03-16-RM-004 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8365507
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 15:45 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B133D SDG#: MHF33-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

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Analysis Report

Sample Description: GW-11109613-B48D-05-03-16-AC-005 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8365508
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 16:50 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B48D- SDG#: MHF33-05

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	12	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.42	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.044 J	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.050	0.010	1
08357	Chrysene	218-01-9	0.034 J	0.050	0.010	1
08357	Fluorene	86-73-7	2.3	0.050	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.060	0.030	1
08357	Phenanthrene	85-01-8	2.4	0.060	0.030	1
08357	Pyrene	129-00-0	0.43	0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 22:13	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 22:13	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 01:35	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 14:33	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:39	Tara L Snyder	1

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Analysis Report

Sample Description: GW-11109613-B48D-05-03-16-AC-005 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365508
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/03/2016 16:50 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B48D- SDG#: MHF33-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B116-05-04-16-RM-006 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365509
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 09:55 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B116- SDG#: MHF33-06

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	0.5	J	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.27		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.058		0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.013	J	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.017	J	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.		0.050	0.010	1
08357	Chrysene	218-01-9	0.066		0.050	0.010	1
08357	Fluorene	86-73-7	1.5		0.050	0.010	1
08357	Naphthalene	91-20-3	0.070		0.060	0.030	1
08357	Phenanthrene	85-01-8	0.054	J	0.060	0.030	1
08357	Pyrene	129-00-0	0.65		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0094	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00088	J	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 22:36	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 22:36	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 02:05	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 14:49	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:41	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B116-05-04-16-RM-006 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365509
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 09:55 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B116- SDG#: MHF33-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B115-05-04-16-AC-007 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365510
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 12:15 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B115- SDG#: MHF33-07

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.065		0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.034	J	0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.012	J	0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.		0.052	0.010	1
08357	Chrysene	218-01-9	0.035	J	0.052	0.010	1
08357	Fluorene	86-73-7	0.13		0.052	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.063	0.031	1
08357	Phenanthrene	85-01-8	0.40		0.063	0.031	1
08357	Pyrene	129-00-0	0.24		0.052	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 22:59	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 22:59	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 02:34	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 15:04	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:42	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: GW-11109613-B115-05-04-16-AC-007 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365510
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 12:15 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B115- SDG#: MHF33-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B117-05-04-16-AC-008 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365511
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 12:35 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B117- SDG#: MHF33-08

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.8	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.46	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.34	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.42	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.22	0.051	0.010	1
08357	Chrysene	218-01-9	0.54	0.051	0.010	1
08357	Fluorene	86-73-7	0.74	0.051	0.010	1
08357	Naphthalene	91-20-3	0.11	0.061	0.031	1
08357	Phenanthrene	85-01-8	0.94	0.061	0.031	1
08357	Pyrene	129-00-0	3.3	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 23:22	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 23:22	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/15/2016 03:04	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 15:51	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	2	161276050002A	05/09/2016 15:29	Patrick J Engle	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B117-05-04-16-AC-008 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365511
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 12:35 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B117- SDG#: MHF33-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B168-05-04-16-AC-009 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365512
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 14:00 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B168- SDG#: MHF33-09

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	2	J	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	0.5	J	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.52		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.066		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.037	J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.038	J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.016	J	0.051	0.010	1
08357	Chrysene	218-01-9	0.063		0.051	0.010	1
08357	Fluorene	86-73-7	2.1		0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.061	0.030	1
08357	Phenanthrene	85-01-8	0.92		0.061	0.030	1
08357	Pyrene	129-00-0	0.41		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0094	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 23:44	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 23:44	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/16/2016 20:39	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 16:07	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:49	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B168-05-04-16-AC-009 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365512
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 14:00 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B168- SDG#: MHF33-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B153-05-04-16-RM-010 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365513
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 14:05 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B153- SDG#: MHF33-10

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.099		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.052		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.038	J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.040	J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.018	J	0.051	0.010	1
08357	Chrysene	218-01-9	0.058		0.051	0.010	1
08357	Fluorene	86-73-7	0.018	J	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.061	0.030	1
08357	Phenanthrene	85-01-8	0.043	J	0.061	0.030	1
08357	Pyrene	129-00-0	0.27		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/13/2016 00:07	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/13/2016 00:07	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16127WAI026	05/16/2016 21:09	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16127WAI026	05/07/2016 13:00	Shawn J McMullen	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 16:22	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1
06035	Lead	SW-846 6020	1	161276050002A	05/08/2016 20:51	Tara L Snyder	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B153-05-04-16-RM-010 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8365513
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 14:05 by AC

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B153- SDG#: MHF33-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161276050002	05/08/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-05-04-16-RM-011 Water
Philadelphia Refinery

LL Sample # WW 8365514
LL Group # 1657425
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/04/2016 15:15

Submitted: 05/05/2016 09:25
Reported: 05/17/2016 14:13

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

153-T SDG#: MHF33-11TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161332AA	05/12/2016 19:34	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161332AA	05/12/2016 19:34	Hu Yang	1
10398	EDB in Wastewater	SW-846 8011	1	161310023A	05/12/2016 16:38	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161310023A	05/11/2016 10:00	David S Schrum	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/17/2016 14:13

Group Number: 1657425

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Batch number: D161332AA	Sample number(s): 8365504-8365514		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: 16127WAI026	Sample number(s): 8365504-8365513		
Anthracene	N.D.	0.050	0.010
Benzo(a)anthracene	N.D.	0.050	0.010
Benzo(a)pyrene	N.D.	0.050	0.010
Benzo(b)fluoranthene	N.D.	0.050	0.010
Benzo(g,h,i)perylene	N.D.	0.050	0.010
Chrysene	N.D.	0.050	0.010
Fluorene	N.D.	0.050	0.010
Naphthalene	N.D.	0.060	0.030
Phenanthrene	N.D.	0.060	0.030
Pyrene	N.D.	0.050	0.010
Batch number: 161310023A	Sample number(s): 8365504-8365514		
Ethylene dibromide	N.D.	0.030	0.010
	mg/l	mg/l	mg/l
Batch number: 161276050002A	Sample number(s): 8365504-8365513		
Lead	N.D.	0.0010	0.00013

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: D161332AA	Sample number(s): 8365504-8365514								
Benzene	20	19.35			97		78-120		
1,2-Dichloroethane	20	19.61			98		72-127		
Ethylbenzene	20	20.79			104		78-120		
Isopropylbenzene	20	21.46			107		80-120		
Methyl Tertiary Butyl Ether	20	20.74			104		75-120		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/17/2016 14:13

Group Number: 1657425

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Toluene	20	20.93			105		80-120		
1,2,4-Trimethylbenzene	20	21.91			110		75-120		
1,3,5-Trimethylbenzene	20	21.18			106		75-120		
Xylene (Total)	60	64.93			108		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16127WAI026	Sample number(s): 8365504-8365513								
Anthracene	1.00	0.756	1.00	0.819	76	82	69-120	8	30
Benzo(a)anthracene	1.00	0.883	1.00	0.889	88	89	71-118	1	30
Benzo(a)pyrene	1.00	0.819	1.00	0.853	82	85	70-120	4	30
Benzo(b)fluoranthene	1.00	0.839	1.00	0.892	84	89	76-132	6	30
Benzo(g,h,i)perylene	1.00	0.758	1.00	0.793	76	79	58-129	5	30
Chrysene	1.00	0.803	1.00	0.816	80	82	66-119	2	30
Fluorene	1.00	0.810	1.00	0.865	81	86	69-116	7	30
Naphthalene	1.00	0.811	1.00	0.966	81	97	61-112	17	30
Phenanthrene	1.00	0.880	1.00	0.911	88	91	69-113	3	30
Pyrene	1.00	0.736	1.00	0.758	74	76	64-115	3	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161310023A	Sample number(s): 8365504-8365514								
Ethylene dibromide	0.128	0.122	0.128	0.126	95	98	60-140	3	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161276050002A	Sample number(s): 8365504-8365513								
Lead	0.0150	0.0154			103		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: D161332AA	Sample number(s): 8365504-8365514 UNSPK: 8365504									
Benzene	N.D.	20	19.46	20	20.27	97	101	78-120	4	30
1,2-Dichloroethane	N.D.	20	19.23	20	19.85	96	99	72-127	3	30
Ethylbenzene	N.D.	20	21.48	20	21.88	107	109	78-120	2	30
Isopropylbenzene	N.D.	20	22.1	20	23.08	110	115	80-120	4	30
Methyl Tertiary Butyl Ether	1.81	20	20.99	20	22.01	96	101	75-120	5	30
Toluene	N.D.	20	21.13	20	21.86	106	109	80-120	3	30
1,2,4-Trimethylbenzene	N.D.	20	21.93	20	22.64	110	113	75-120	3	30
1,3,5-Trimethylbenzene	N.D.	20	21.58	20	21.73	108	109	75-120	1	30
Xylene (Total)	N.D.	60	67.22	60	68.28	112	114	80-120	2	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161310023A	Sample number(s): 8365504-8365514 UNSPK: P366680									

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/17/2016 14:13

Group Number: 1657425

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Ethylene dibromide	N.D.	0.122	0.122	0.122	0.120	100	98	60-140	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 161276050002A	Sample number(s): 8365504-8365513 UNSPK: P365541									
Lead	N.D.	0.0150	0.0159	0.0150	0.0156	106	104	75-125	2	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 161276050002A	Sample number(s): 8365504-8365513 BKG: P365541			
Lead	N.D.	N.D.	0 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: D161332AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8365504	104	95	102	101
8365505	101	98	100	102
8365506	99	94	101	100
8365507	101	94	101	102
8365508	102	97	100	100
8365509	104	96	94	99
8365510	105	96	99	105
8365511	96	95	100	102
8365512	103	99	100	103
8365513	98	97	101	102
8365514	101	100	101	100
Blank	103	98	97	100
LCS	98	96	101	101
MS	101	98	101	101
MSD	100	102	103	102
Limits:	80-116	77-113	80-113	78-113

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/17/2016 14:13

Group Number: 1657425

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAHs in waters by SIM
Batch number: 16127WAI026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8365504	81	67	75
8365505	79	62	75
8365506	81	70	78
8365507	63	65	80
8365508	78	79	79
8365509	56	69	82
8365510	80	81	78
8365511	125	73	83
8365512	87	79	79
8365513	69	81	76
Blank	87	83	77
LCS	64	80	71
LCSD	73	84	75
Limits:	50-133	41-137	43-126

Analysis Name: EDB in Wastewater
Batch number: 161310023A

	1,1,2,2-Tetrachloroethane
8365504	101
8365505	107
8365506	101
8365507	107
8365508	105
8365509	109
8365510	106
8365511	106
8365512	111
8365513	110
8365514	104
Blank	95
LCS	97
LCSD	99
MS	102
MSD	103
Limits:	46-136

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1657425 Sample # 8365504-14

COC # 500116

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philadelphia, 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

1 of 2

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	Surface	NPDES	Water	Other:	Total # of Containers	Lead	Select VOCs 8260	EDB 8011	Select SVOCs 8270 SIM
GW-11109613-B134D-05-03-16-AC-001	05-03-16	1310	X						X			X		8	1	3	2	2
GW-11109613-B132D-05-03-16-RM-002	↓	1200	X						X			X		8	1	3	2	2
GW-11109613-DUP1-05-03-16-AC-003	↓	1330	X						X			X		8	1	3	2	2
GW-11109613-B133D-05-03-16-RM-004	↓	1545	X						X			X		8	1	3	2	2
GW-11109613-B48D-05-03-16-AC-005	↓	1650	X						X			X		8	1	3	2	2
GW-11109613-B116-05-04-16-RM-006	05-04-16	0955	X						X			X		8	1	3	2	2
GW-11109613-B115-05-04-16-AC-007	↓	1215	X						X			X		8	1	3	2	2
GW-11109613-B117-05-04-16-AC-008	↓	1235	X						X			X		8	1	3	2	2
GW-11109613-B168-05-04-16-AC-009	↓	1400	X						X			X		8	1	3	2	2
GW-11109613-B153-05-04-16-RM-010	↓	1405	X						X			X		9	2	3	2	2

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	5/4/16	1530			
			[signature]	5-5-16	925

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.7-1.2°C

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1657425 Sample # 8365504-14

COC # 500117

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philadelphia 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐

Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐

Other: _____

Analysis Requested

Preservation Codes

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	NPDES	Surface	Other	Total # of Containers	EDB 8011	Select VOCs 8260	Remarks
TB-11109613-05-04-16-RM-011	05-04-16	1515	X					X					4	2	2	trip blanks

Remarks: 2 of 2

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	5/4/16	1530			
			[signature]	5-5-16	935

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.7-1.2 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 145432

Group Number(s): 1657425

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	05/05/2016 9:25
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Joseph Huber (7831) at 12:02 on 05/05/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.7	DT	Wet	Y	Bagged	N
2	DT131	1.2	DT	Wet	Y	Bagged	N

General Comments: Recv'd metals batch QC for GW-1109613-B153-05-04-16-RM-010

2425 New Holland Pike
Lancaster, PA 17605-2425

T 717-656-2300
F 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: May 25, 2016

Project: Philadelphia Refinery

Submittal Date: 05/07/2016
Group Number: 1658374
SDG: MHF34
PO Number: 34004491
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
GW-11109613-B131-05-05-16-RM-012 Grab Groundwater	8370267
GW-11109613-B155-05-05-16-AC-013 Grab Groundwater	8370268
GW-11109613-B45-05-05-16-RM-014 Grab Groundwater	8370269
GW-11109613-B165-05-05-16-AC-015 Grab Groundwater	8370270
GW-11109613-B174-05-05-16-RM-016 Grab Groundwater	8370271
GW-11109613-B170-05-05-16-AC-017 Grab Groundwater	8370272
GW-11109613-B173-05-05-16-RM-018 Grab Groundwater	8370273
GW-11109613-DUP2-05-05-16-AC-019 Grab Groundwater	8370274
GW-11109613-B133-05-05-16-RM-020 Grab Groundwater	8370275
GW-11109613-B172-05-05-16-AC-021 Grab Groundwater	8370276
GW-11109613-U4-05-05-16-AC-022 Grab Groundwater	8370277
TB-11109613-05-06-16-AC-023 Water	8370278

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: GW-11109613-B131-05-05-16-RM-012 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370267
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 08:40 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR131 SDG#: MHF34-01

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	1		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	8		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	0.6	J	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.76		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.37		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.090		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.12		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.021	J	0.051	0.010	1
08357	Chrysene	218-01-9	0.29		0.051	0.010	1
08357	Fluorene	86-73-7	1.9		0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.061	0.030	1
08357	Phenanthrene	85-01-8	0.66		0.061	0.030	1
08357	Pyrene	129-00-0	2.3		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 12:08	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 12:08	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/19/2016 22:50	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 21:27	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B131-05-05-16-RM-012 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370267
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 08:40 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR131 SDG#: MHF34-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:34	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B155-05-05-16-AC-013 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370268
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 11:04 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR155 SDG#: MHF34-02

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	120,000		2,000	1,000	2000
10945	1,2-Dichloroethane	107-06-2	N.D.		50	25	50
10945	Ethylbenzene	100-41-4	120		50	25	50
10945	Isopropylbenzene	98-82-8	79	J	100	25	50
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		50	25	50
10945	Toluene	108-88-3	820		50	25	50
10945	1,2,4-Trimethylbenzene	95-63-6	62	J	100	25	50
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		100	25	50
10945	Xylene (Total)	1330-20-7	150		50	25	50
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	3.7		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.31		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.25		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.24		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.088		0.051	0.010	1
08357	Chrysene	218-01-9	0.27		0.051	0.010	1
08357	Fluorene	86-73-7	6.6		0.051	0.010	1
08357	Naphthalene	91-20-3	42		1.2	0.61	20
08357	Phenanthrene	85-01-8	12		1.2	0.61	20
08357	Pyrene	129-00-0	1.3		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 12:31	Anita M Dale	50
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161361AA	05/16/2016 03:47	Hu Yang	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 12:31	Anita M Dale	50
01163	GC/MS VOA Water Prep	SW-846 5030B	2	D161361AA	05/16/2016 03:47	Hu Yang	2000
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/19/2016 23:20	Catherine E Bachman	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B155-05-05-16-AC-013 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370268
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 11:04 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR155 SDG#: MHF34-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 12:10	Catherine E Bachman	20
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 22:14	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:36	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-B45-05-05-16-RM-014 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370269
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 10:00 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR045 SDG#: MHF34-03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.042 J	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.021 J	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.030 J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.043 J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.033 J	0.051	0.010	1
08357	Chrysene	218-01-9	0.050 J	0.051	0.010	1
08357	Fluorene	86-73-7	0.042 J	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.031	1
08357	Phenanthrene	85-01-8	0.065	0.061	0.031	1
08357	Pyrene	129-00-0	0.085	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00014 J	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 10:37	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 10:37	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/19/2016 23:49	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 22:30	Heather M Miller	1

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Analysis Report

Sample Description: GW-11109613-B45-05-05-16-RM-014 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370269
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 10:00 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR045 SDG#: MHF34-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:38	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-B165-05-05-16-AC-015 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370270
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 10:10 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR165 SDG#: MHF34-04

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	4		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	5		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	2		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.48		0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.17		0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.039	J	0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.050	J	0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.025	J	0.052	0.010	1
08357	Chrysene	218-01-9	0.13		0.052	0.010	1
08357	Fluorene	86-73-7	1.4		0.052	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.063	0.031	1
08357	Phenanthrene	85-01-8	0.37		0.063	0.031	1
08357	Pyrene	129-00-0	1.2		0.052	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0096	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0010		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 11:00	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 11:00	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 00:19	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 22:46	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B165-05-05-16-AC-015 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370270
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 10:10 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR165 SDG#: MHF34-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:07	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-B174-05-05-16-RM-016 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370271
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 12:15 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR174 SDG#: MHF34-05

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	5		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.096		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.048	J	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.032	J	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.038	J	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.015	J	0.050	0.010	1
08357	Chrysene	218-01-9	0.042	J	0.050	0.010	1
08357	Fluorene	86-73-7	0.25		0.050	0.010	1
08357	Naphthalene	91-20-3	0.099		0.060	0.030	1
08357	Phenanthrene	85-01-8	0.43		0.060	0.030	1
08357	Pyrene	129-00-0	0.19		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 13:17	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 13:17	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 00:48	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 23:02	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B174-05-05-16-RM-016 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370271
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 12:15 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR174 SDG#: MHF34-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:40	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B170-05-05-16-AC-017 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370272
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 12:22 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR170 SDG#: MHF34-06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	5	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	6	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	2	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.36	0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.10	0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.11	0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.12	0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.047 J	0.052	0.010	1
08357	Chrysene	218-01-9	0.11	0.052	0.010	1
08357	Fluorene	86-73-7	2.5	0.052	0.010	1
08357	Naphthalene	91-20-3	2.3	0.062	0.031	1
08357	Phenanthrene	85-01-8	1.3	0.062	0.031	1
08357	Pyrene	129-00-0	0.35	0.052	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 13:39	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 13:39	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 01:17	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 23:18	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B170-05-05-16-AC-017 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370272
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 12:22 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR170 SDG#: MHF34-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:41	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B173-05-05-16-RM-018 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370273
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 13:45 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR173 SDG#: MHF34-07

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	14		10	5	10
10945	1,2-Dichloroethane	107-06-2	N.D.		10	5	10
10945	Ethylbenzene	100-41-4	N.D.		10	5	10
10945	Isopropylbenzene	98-82-8	27		20	5	10
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		10	5	10
10945	Toluene	108-88-3	5	J	10	5	10
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		20	5	10
10945	1,3,5-Trimethylbenzene	108-67-8	13	J	20	5	10
10945	Xylene (Total)	1330-20-7	N.D.		10	5	10
Reporting limits were raised due to sample foaming.							
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	6.0		0.51	0.10	10
08357	Benzo(a)anthracene	56-55-3	2.1		0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	1.0		0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	1.0		0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	0.25	J	0.51	0.10	10
08357	Chrysene	218-01-9	1.4		0.51	0.10	10
08357	Fluorene	86-73-7	16		0.51	0.10	10
08357	Naphthalene	91-20-3	13		0.61	0.31	10
08357	Phenanthrene	85-01-8	23		0.61	0.31	10
08357	Pyrene	129-00-0	6.4		0.51	0.10	10
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	0.020	J	0.029	0.0097	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00075	J	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 14:02	Anita M Dale	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 14:02	Anita M Dale	10
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 12:39	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B173-05-05-16-RM-018 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370273
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 13:45 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR173 SDG#: MHF34-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 23:34	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:47	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-DUP2-05-05-16-AC-019 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370274
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 12:40 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PRFD2 SDG#: MHF34-08

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	5	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	5	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	1	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.37	0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.10	0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.090	0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.088	0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.043 J	0.052	0.010	1
08357	Chrysene	218-01-9	0.11	0.052	0.010	1
08357	Fluorene	86-73-7	2.3	0.052	0.010	1
08357	Naphthalene	91-20-3	4.8	0.063	0.031	1
08357	Phenanthrene	85-01-8	1.8	0.063	0.031	1
08357	Pyrene	129-00-0	0.34	0.052	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 14:25	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 14:25	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 02:16	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/16/2016 23:49	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: GW-11109613-DUP2-05-05-16-AC-019 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370274
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 12:40 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PRFD2 SDG#: MHF34-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:49	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B133-05-05-16-RM-020 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370275
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 15:45 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR133 SDG#: MHF34-09

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	59		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	1		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	0.7	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	2		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	11		0.51	0.10	10
08357	Benzo(a)anthracene	56-55-3	1.7		0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	0.72		0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	0.81		0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	0.23	J	0.51	0.10	10
08357	Chrysene	218-01-9	1.3		0.51	0.10	10
08357	Fluorene	86-73-7	33		0.51	0.10	10
08357	Naphthalene	91-20-3	N.D.		0.61	0.30	10
08357	Phenanthrene	85-01-8	56		0.61	0.30	10
08357	Pyrene	129-00-0	7.4		0.51	0.10	10
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0096	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 14:48	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 14:48	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 13:09	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/17/2016 00:06	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B133-05-05-16-RM-020 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370275
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 15:45 by RM

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR133 SDG#: MHF34-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:51	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B172-05-05-16-AC-021 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370276
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 13:45 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR172 SDG#: MHF34-10

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	13	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	7	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	0.6 J	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.33	0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.49	0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.45	0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.50	0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.19	0.052	0.010	1
08357	Chrysene	218-01-9	0.51	0.052	0.010	1
08357	Fluorene	86-73-7	0.42	0.052	0.010	1
08357	Naphthalene	91-20-3	0.27	0.062	0.031	1
08357	Phenanthrene	85-01-8	0.38	0.062	0.031	1
08357	Pyrene	129-00-0	1.4	0.052	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00018 J	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 15:11	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 15:11	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 03:15	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/17/2016 00:21	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B172-05-05-16-AC-021 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8370276
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 13:45 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PR172 SDG#: MHF34-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:52	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-U4-05-05-16-AC-022 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370277
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 15:50 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PRU4- SDG#: MHF34-11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	2	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	0.9 J	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.058	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.42	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.78	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.33	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.44	0.051	0.010	1
08357	Chrysene	218-01-9	1.1	0.051	0.010	1
08357	Fluorene	86-73-7	0.085	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.062	0.031	1
08357	Phenanthrene	85-01-8	N.D.	0.062	0.031	1
08357	Pyrene	129-00-0	1.1	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00050 J	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 15:34	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 15:34	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16131WAL026	05/20/2016 03:44	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16131WAL026	05/11/2016 08:30	Kayla Yuditsky	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/17/2016 00:37	Heather M Miller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-U4-05-05-16-AC-022 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8370277
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/05/2016 15:50 by AC

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PRU4- SDG#: MHF34-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161336050002A	05/13/2016 12:54	Scott P Cuff	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161336050002	05/12/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-05-06-16-AC-023 Water
Philadelphia Refinery

LL Sample # WW 8370278
LL Group # 1658374
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/06/2016 09:00

Submitted: 05/07/2016 10:30
Reported: 05/25/2016 09:10

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

PRTRB SDG#: MHF34-12TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 15:57	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 15:57	Anita M Dale	1
10398	EDB in Wastewater	SW-846 8011	1	161330023A	05/17/2016 01:25	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330023A	05/13/2016 08:30	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/25/2016 09:10

Group Number: 1658374

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Batch number: D161342AA	Sample number(s): 8370267-8370278		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: D161361AA	Sample number(s): 8370268		
Benzene	N.D.	1	0.5
Batch number: 16131WAL026	Sample number(s): 8370267-8370277		
Anthracene	N.D.	0.050	0.010
Benzo(a)anthracene	N.D.	0.050	0.010
Benzo(a)pyrene	N.D.	0.050	0.010
Benzo(b)fluoranthene	N.D.	0.050	0.010
Benzo(g,h,i)perylene	N.D.	0.050	0.010
Chrysene	N.D.	0.050	0.010
Fluorene	N.D.	0.050	0.010
Naphthalene	N.D.	0.060	0.030
Phenanthrene	N.D.	0.060	0.030
Pyrene	N.D.	0.050	0.010
Batch number: 161330023A	Sample number(s): 8370267-8370278		
Ethylene dibromide	N.D.	0.030	0.010
	mg/l	mg/l	mg/l
Batch number: 161336050002A	Sample number(s): 8370267-8370277		
Lead	N.D.	0.0010	0.00013

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: D161342AA	Sample number(s): 8370267-8370278								
Benzene	20	17.51			88		78-120		
1,2-Dichloroethane	20	17.75			89		72-127		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/25/2016 09:10

Group Number: 1658374

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Ethylbenzene	20	18.77			94		78-120		
Isopropylbenzene	20	19.52			98		80-120		
Methyl Tertiary Butyl Ether	20	16.29			81		75-120		
Toluene	20	18.64			93		80-120		
1,2,4-Trimethylbenzene	20	20.1			100		75-120		
1,3,5-Trimethylbenzene	20	19.48			97		75-120		
Xylene (Total)	60	57.33			96		80-120		
Batch number: D161361AA	Sample number(s): 8370268								
Benzene	20	16.46			82		78-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16131WAL026	Sample number(s): 8370267-8370277								
Anthracene	1.00	0.918	1.00	0.900	92	90	69-120	2	30
Benzo(a)anthracene	1.00	0.867	1.00	0.842	87	84	71-118	3	30
Benzo(a)pyrene	1.00	0.912	1.00	0.878	91	88	70-120	4	30
Benzo(b)fluoranthene	1.00	0.981	1.00	0.949	98	95	76-132	3	30
Benzo(g,h,i)perylene	1.00	0.837	1.00	0.789	84	79	58-129	6	30
Chrysene	1.00	0.885	1.00	0.846	89	85	66-119	5	30
Fluorene	1.00	0.869	1.00	0.848	87	85	69-116	3	30
Naphthalene	1.00	0.873	1.00	0.850	87	85	61-112	3	30
Phenanthrene	1.00	0.977	1.00	0.945	98	94	69-113	3	30
Pyrene	1.00	0.876	1.00	0.842	88	84	64-115	4	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161330023A	Sample number(s): 8370267-8370278								
Ethylene dibromide	0.128	0.122	0.128	0.122	95	95	60-140	0	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161336050002A	Sample number(s): 8370267-8370277								
Lead	0.0150	0.0150			100		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: D161342AA	Sample number(s): 8370267-8370278 UNSPK: 8370270									
Benzene	3.94	20	22.86	20	23.08	95	96	78-120	1	30
1,2-Dichloroethane	N.D.	20	20.14	20	18.61	101	93	72-127	8	30
Ethylbenzene	N.D.	20	20.6	20	20.94	103	105	78-120	2	30
Isopropylbenzene	4.82	20	26.46	20	26.89	108	110	80-120	2	30
Methyl Tertiary Butyl Ether	1.53	20	23.57	20	20.43	110	95	75-120	14	30
Toluene	N.D.	20	18.92	20	20.46	95	102	80-120	8	30
1,2,4-Trimethylbenzene	N.D.	20	21.08	20	21.55	105	108	75-120	2	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/25/2016 09:10

Group Number: 1658374

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,3,5-Trimethylbenzene	N.D.	20	20.79	20	21.17	104	106	75-120	2	30
Xylene (Total)	N.D.	60	63.7	60	64.37	106	107	80-120	1	30
Batch number: D161361AA	Sample number(s): 8370268 UNSPK: P377761									
Benzene	N.D.	20	16.99	20	17.57	85	88	78-120	3	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161330023A	Sample number(s): 8370267-8370278 UNSPK: P369332									
Ethylene dibromide	N.D.	0.123	0.121			99		60-140		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 161336050002A	Sample number(s): 8370267-8370277 UNSPK: 8370270									
Lead	0.00102	0.0150	0.0165	0.0150	0.0162	103	101	75-125	2	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 161330023A	Sample number(s): 8370267-8370278 BKG: P369333			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	mg/l	mg/l		
Batch number: 161336050002A	Sample number(s): 8370267-8370277 BKG: 8370270			
Lead	0.00102	0.00103	1 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: D161342AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8370267	99	95	102	103
8370268	97	96	104	102
8370269	100	99	102	99
8370270	103	95	98	106
8370271	99	97	100	100
8370272	99	98	101	115*
8370273	97	95	102	102

*- Outside of specification
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(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/25/2016 09:10

Group Number: 1658374

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8370274	90	83	101	113
8370275	98	94	102	106
8370276	101	92	101	103
8370277	99	98	100	101
8370278	98	95	102	100
Blank	100	97	101	99
LCS	99	96	101	101
MS	102	100	95	105
MSD	98	98	102	103
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 16131WAL026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8370267	128	82	78
8370268	123	80	83
8370269	90	85	77
8370270	102	83	78
8370271	86	87	76
8370272	100	88	93
8370273	111	78	91
8370274	115	86	87
8370275	201*	80	83
8370276	89	85	79
8370277	74	92	79
Blank	86	84	73
LCS	92	89	78
LCSD	89	86	75
Limits:	50-133	41-137	43-126

Analysis Name: EDB in Wastewater
Batch number: 161330023A

	1,1,2,2-Tetrachloroethane
8370267	129
8370268	130
8370269	108
8370270	104
8370271	107
8370272	146*
8370273	116
8370274	119
8370275	124
8370276	107
8370277	111
8370278	106
Blank	102
DUP	115

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/25/2016 09:10

Group Number: 1658374

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	1,1,2,2-Tetrachloroethane
LCS	95
LCSD	98
MS	100
Limits:	46-136

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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Acct. # 10177 Group # 1658374 Sample # 8370267-78

COC # 500118

Client Information

Client: Evergreen	Acct. #:
Project Name/#: Evergreen Philadelphia 11109613	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: A Cannon	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only: FSC: ____ SCR#: ____

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Lead	Select VOCs 8260	Select SVOCs 8270 SIM	EDB 8011	Remarks
GW-11109613-B131-05-05-16-RM-012	05-05-16	0840	x			x		8	1	3	2	2	1 of 2
GW-11109613-B155-05-05-16-AC-013	↓	1104	x			x		8	1	3	2	2	
GW-11109613-B45-05-05-16-RM-014	↓	1000	x			x		8	1	3	2	2	AC
GW-11109613-B165-05-05-16-AC-015	↓	1010	x			x		8	1	3	2	2	
GW-11109613-B174-05-05-16-RM-016	↓	1215	x			x		9	2	3	2	2	QAQC
GW-11109613-B170-05-05-16-AC-017	↓	1222	x			x		8	1	3	2	2	
GW-11109613-B173-05-05-16-RM-018	↓	1345	x			x		8	1	3	2	2	
GW-11109613-DUP2-05-05-16-AC-019	↓	1240	x			x		8	1	3	2	2	
GW-11109613-B133-05-05-16-RM-020	↓	1545	x			x		8	1	3	2	2	
GW-11109613-B172-05-05-16-AC-021	↓	1345	x			x		8	1	3	2	2	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	5/6/16	1200			
			[signature]	5/7/16	1830

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx X Other ____

Temperature upon receipt 1.7 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0216

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1658374 Sample # 8370267-78

COC # 500115

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philadelphia 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#: 185094

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	Surface	NPDES	Water	Other:	Total # of Containers	Lead	Select VOCs 8260	Select SVOCs 8270 SIM	EDB 8011	Remarks
GW-11109613-U4-05-05-16-AC-022	05-05-16	1550	X						X			X		8	1	3	2	2	
TB-11109613-05-06-16-AC-023	05/06/16	0900	X						X			X	4	~~2~~ 1		2		2	trip blanks

Matrix: Soil ☐ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☒ Surface ☐ NPDES ☐ Other: ____

Analysis Requested — Preservation Codes

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

2 of 2

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	4/29/16	0910			
[illegible]	5/6/16	1200			
			[illegible]	5/7/16	1030

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ✓ Other ____

Temperature upon receipt 1.7 / 2.6 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

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Sample Administration Receipt Documentation Log

Doc Log ID: 145763

Group Number(s): 1658374

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	05/07/2016 10:30
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Krista Abel (3058) at 12:43 on 05/07/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.7	DT	Wet	Y	Bagged	N
2	DT146	2.6	DT	Wet	Y	Bagged	N

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Lancaster, PA 17605-2425
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F | 717-656-2681
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: May 23, 2016

Project: Philadelphia Refinery

Submittal Date: 05/10/2016
Group Number: 1659064
SDG: MHF35
PO Number: 34004491
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
GW-11109613-B169-05-09-16-MM-024 Grab Groundwater	8373129
GW-11109613-B152-05-09-16-AC-025 Grab Groundwater	8373130
GW-11109613-URS4-05-09-16-MM-026 Grab Groundwater	8373131
GW-11109613-DUP3-05-09-16-AC-027 Grab Groundwater	8373132
GW-11109613-URS1-05-09-16-MM-028 Grab Groundwater	8373133
GW-11109613-B145-05-09-16-AC-029 Grab Groundwater	8373134
GW-11109613-URS3-05-09-16-MM-030 Grab Groundwater	8373135
GW-11109613-B164-05-09-16-AC-031 Grab Groundwater	8373136
GW-11109613-B125-05-09-16-MM-032 Grab Groundwater	8373137
GW-11109613-B158-05-09-16-AC-033 Grab Groundwater	8373138
TB-11109613-05-10-16-AC-034 Water	8373139
GW-11109613-B126-05-10-16-MM-035 Grab Groundwater	8373140

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: GW-11109613-B169-05-09-16-MM-024 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373129
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 10:00 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3501 SDG#: MHF35-01

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	0.7	J	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.084		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.17		0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.17		0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.19		0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.12		0.050	0.010	1
08357	Chrysene	218-01-9	0.17		0.050	0.010	1
08357	Fluorene	86-73-7	0.043	J	0.050	0.010	1
08357	Naphthalene	91-20-3	0.071		0.060	0.030	1
08357	Phenanthrene	85-01-8	0.069		0.060	0.030	1
08357	Pyrene	129-00-0	0.27		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0338		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 16:20	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 16:20	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/20/2016 13:39	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 19:54	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 10:55	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B169-05-09-16-MM-024 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373129
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 10:00 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3501 SDG#: MHF35-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B152-05-09-16-AC-025 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373130
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 12:10 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3502 SDG#: MHF35-02

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	42	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	3	1	0.5	1
10945	Isopropylbenzene	98-82-8	120	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	16	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	5	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	3	2	0.5	1
10945	Xylene (Total)	1330-20-7	28	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	2.6	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.12	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.088	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.11	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.058	0.050	0.010	1
08357	Chrysene	218-01-9	0.13	0.050	0.010	1
08357	Fluorene	86-73-7	2.3	0.050	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.060	0.030	1
08357	Phenanthrene	85-01-8	4.9	0.060	0.030	1
08357	Pyrene	129-00-0	1.5	0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 16:42	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 16:42	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/20/2016 14:08	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 20:25	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:00	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B152-05-09-16-AC-025 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8373130
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 12:10 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3502 SDG#: MHF35-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS4-05-09-16-MM-026 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373131
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 14:00 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3503 SDG#: MHF35-03

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	2		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.052		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.012	J	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.		0.050	0.010	1
08357	Chrysene	218-01-9	N.D.		0.050	0.010	1
08357	Fluorene	86-73-7	0.019	J	0.050	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.060	0.030	1
08357	Phenanthrene	85-01-8	0.055	J	0.060	0.030	1
08357	Pyrene	129-00-0	0.074		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0098	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 17:05	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 17:05	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/20/2016 14:38	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 20:56	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:02	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS4-05-09-16-MM-026 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373131
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 14:00 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3503 SDG#: MHF35-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-DUP3-05-09-16-AC-027 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373132
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 12:30 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3504 SDG#: MHF35-04FD

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	39	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	3	1	0.5	1
10945	Isopropylbenzene	98-82-8	110	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	15	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	4	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	3	2	0.5	1
10945	Xylene (Total)	1330-20-7	25	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	2.1	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.14	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.11	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.13	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.081	0.051	0.010	1
08357	Chrysene	218-01-9	0.14	0.051	0.010	1
08357	Fluorene	86-73-7	2.3	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.030	1
08357	Phenanthrene	85-01-8	3.8	0.061	0.030	1
08357	Pyrene	129-00-0	1.6	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 17:28	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 17:28	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/20/2016 15:07	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 21:11	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:04	Choon Y Tian	1

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Analysis Report

Sample Description: GW-11109613-DUP3-05-09-16-AC-027 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8373132
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 12:30 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3504 SDG#: MHF35-04FD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

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Analysis Report

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Sample Description: GW-11109613-URS1-05-09-16-MM-028 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373133
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 13:30 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3505 SDG#: MHF35-05

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.33		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.038	J	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.028	J	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.034	J	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.012	J	0.050	0.010	1
08357	Chrysene	218-01-9	0.035	J	0.050	0.010	1
08357	Fluorene	86-73-7	5.2		0.050	0.010	1
08357	Naphthalene	91-20-3	0.29		0.060	0.030	1
08357	Phenanthrene	85-01-8	0.73		0.060	0.030	1
08357	Pyrene	129-00-0	0.18		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0098	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 17:51	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 17:51	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/20/2016 15:37	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 21:27	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:05	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS1-05-09-16-MM-028 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373133
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 13:30 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3505 SDG#: MHF35-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

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Analysis Report

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Sample Description: GW-11109613-B145-05-09-16-AC-029 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373134
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 13:15 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3506 SDG#: MHF35-06

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	6		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	1		1	0.5	1
10945	Isopropylbenzene	98-82-8	77		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	2		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	1	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	1	J	2	0.5	1
10945	Xylene (Total)	1330-20-7	6		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	7.4		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.68		0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.33		0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.36		0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.11		0.050	0.010	1
08357	Chrysene	218-01-9	0.47		0.050	0.010	1
08357	Fluorene	86-73-7	34		0.50	0.10	10
08357	Naphthalene	91-20-3	4.4		0.060	0.030	1
08357	Phenanthrene	85-01-8	23		0.60	0.30	10
08357	Pyrene	129-00-0	4.2		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.030	0.0099	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00070	J	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 18:14	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 18:14	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 09:48	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 13:52	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 22:13	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1

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Analysis Report

Sample Description: GW-11109613-B145-05-09-16-AC-029 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8373134
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 13:15 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3506 SDG#: MHF35-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:07	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

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Analysis Report

Sample Description: GW-11109613-URS3-05-09-16-MM-030 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373135
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 15:35 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3507 SDG#: MHF35-07

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	4		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	0.6	J	1	0.5	1
10945	Isopropylbenzene	98-82-8	55		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	2		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	0.8	J	2	0.5	1
10945	Xylene (Total)	1330-20-7	9		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	21		0.51	0.10	10
08357	Benzo(a)anthracene	56-55-3	66		0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	47		0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	56		0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	14		0.51	0.10	10
08357	Chrysene	218-01-9	46		0.51	0.10	10
08357	Fluorene	86-73-7	27		0.51	0.10	10
08357	Naphthalene	91-20-3	3.2		0.61	0.31	10
08357	Phenanthrene	85-01-8	55		0.61	0.31	10
08357	Pyrene	129-00-0	130		2.6	0.51	50
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	0.011	J	0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0013		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161342AA	05/13/2016 18:37	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161342AA	05/13/2016 18:37	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 10:17	Catherine E Bachman	10
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 14:21	Catherine E Bachman	50
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 22:29	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1

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Analysis Report

Sample Description: GW-11109613-URS3-05-09-16-MM-030 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373135
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 15:35 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3507 SDG#: MHF35-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 10:44	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

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Analysis Report

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Sample Description: GW-11109613-B164-05-09-16-AC-031 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373136
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 17:00 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3508 SDG#: MHF35-08

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	5	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.026 J	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.027 J	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.047 J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.049 J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.035 J	0.051	0.010	1
08357	Chrysene	218-01-9	0.027 J	0.051	0.010	1
08357	Fluorene	86-73-7	0.081	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.062	0.031	1
08357	Phenanthrene	85-01-8	N.D.	0.062	0.031	1
08357	Pyrene	129-00-0	0.043 J	0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0011	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161341AA	05/13/2016 12:19	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161341AA	05/13/2016 12:19	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 10:49	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 22:44	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:09	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B164-05-09-16-AC-031 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373136
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 17:00 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3508 SDG#: MHF35-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B125-05-09-16-MM-032 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373137
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 17:30 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3509 SDG#: MHF35-09

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	9		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	0.6	J	1	0.5	1
10945	Isopropylbenzene	98-82-8	8		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	3		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	2	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	3		2	0.5	1
10945	Xylene (Total)	1330-20-7	30		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.5		0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.45		0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.23		0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.25		0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.070		0.050	0.010	1
08357	Chrysene	218-01-9	0.34		0.050	0.010	1
08357	Fluorene	86-73-7	4.8		0.050	0.010	1
08357	Naphthalene	91-20-3	0.40		0.060	0.030	1
08357	Phenanthrene	85-01-8	1.2		0.060	0.030	1
08357	Pyrene	129-00-0	2.1		0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00024	J	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161341AA	05/13/2016 11:56	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161341AA	05/13/2016 11:56	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 11:21	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 23:00	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:11	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B125-05-09-16-MM-032 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373137
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 17:30 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3509 SDG#: MHF35-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B158-05-09-16-AC-033 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373138
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 15:30 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3510 SDG#: MHF35-10

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.027 J	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.058	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.045 J	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.051	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.029 J	0.050	0.010	1
08357	Chrysene	218-01-9	0.051	0.050	0.010	1
08357	Fluorene	86-73-7	0.064	0.050	0.010	1
08357	Naphthalene	91-20-3	0.042 J	0.060	0.030	1
08357	Phenanthrene	85-01-8	0.040 J	0.060	0.030	1
08357	Pyrene	129-00-0	0.22	0.050	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0012	0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161341AA	05/13/2016 10:48	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161341AA	05/13/2016 10:48	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 11:52	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 23:15	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:12	Choon Y Tian	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B158-05-09-16-AC-033 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8373138
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/09/2016 15:30 by AC

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3510 SDG#: MHF35-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-05-10-16-AC-034 Water
Philadelphia Refinery

LL Sample # WW 8373139
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 10:00

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3511 SDG#: MHF35-11TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161341AA	05/13/2016 10:25	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161341AA	05/13/2016 10:25	Anita M Dale	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 23:31	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B126-05-10-16-MM-035 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373140
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 09:45 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3512 SDG#: MHF35-12

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	95		10	5	10
10945	1,2-Dichloroethane	107-06-2	N.D.		10	5	10
10945	Ethylbenzene	100-41-4	13		10	5	10
10945	Isopropylbenzene	98-82-8	60		20	5	10
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		10	5	10
10945	Toluene	108-88-3	40		10	5	10
10945	1,2,4-Trimethylbenzene	95-63-6	8	J	20	5	10
10945	1,3,5-Trimethylbenzene	108-67-8	7	J	20	5	10
10945	Xylene (Total)	1330-20-7	64		10	5	10
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	9.1		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.71		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.38		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.36		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.11		0.051	0.010	1
08357	Chrysene	218-01-9	0.60		0.051	0.010	1
08357	Fluorene	86-73-7	43		0.51	0.10	10
08357	Naphthalene	91-20-3	22		0.61	0.31	10
08357	Phenanthrene	85-01-8	53		0.61	0.31	10
08357	Pyrene	129-00-0	4.7		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D161341AA	05/13/2016 12:42	Anita M Dale	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D161341AA	05/13/2016 12:42	Anita M Dale	10
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 12:22	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16132WAK026	05/21/2016 14:51	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16132WAK026	05/12/2016 08:00	Jessica M Cook	1
10398	EDB in Wastewater	SW-846 8011	1	161330026A	05/16/2016 23:46	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161330026A	05/13/2016 08:30	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B126-05-10-16-MM-035 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8373140
LL Group # 1659064
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 09:45 by MM

Submitted: 05/10/2016 16:05
Reported: 05/23/2016 19:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3512 SDG#: MHF35-12

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	161376050002A	05/18/2016 11:14	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161376050002	05/17/2016 08:28	James L Mertz	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/23/2016 19:26

Group Number: 1659064

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Batch number: D161341AA	Sample number(s): 8373136-8373140		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: D161342AA	Sample number(s): 8373129-8373135		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: 16132WAK026	Sample number(s): 8373129-8373138,8373140		
Anthracene	N.D.	0.050	0.010
Benzo(a)anthracene	N.D.	0.050	0.010
Benzo(a)pyrene	N.D.	0.050	0.010
Benzo(b)fluoranthene	N.D.	0.050	0.010
Benzo(g,h,i)perylene	N.D.	0.050	0.010
Chrysene	N.D.	0.050	0.010
Fluorene	N.D.	0.050	0.010
Naphthalene	N.D.	0.060	0.030
Phenanthrene	N.D.	0.060	0.030
Pyrene	N.D.	0.050	0.010
Batch number: 161330026A	Sample number(s): 8373129-8373140		
Ethylene dibromide	N.D.	0.030	0.010
	mg/l	mg/l	mg/l
Batch number: 161376050002A	Sample number(s): 8373129-8373138,8373140		
Lead	N.D.	0.0010	0.00013

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/23/2016 19:26

Group Number: 1659064

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: D161341AA	Sample number(s): 8373136-8373140								
Benzene	20	17.98			90		78-120		
1,2-Dichloroethane	20	17.84			89		72-127		
Ethylbenzene	20	19.34			97		78-120		
Isopropylbenzene	20	19.65			98		80-120		
Methyl Tertiary Butyl Ether	20	15.46			77		75-120		
Toluene	20	19.18			96		80-120		
1,2,4-Trimethylbenzene	20	19.89			99		75-120		
1,3,5-Trimethylbenzene	20	19.66			98		75-120		
Xylene (Total)	60	59.76			100		80-120		
Batch number: D161342AA	Sample number(s): 8373129-8373135								
Benzene	20	17.51			88		78-120		
1,2-Dichloroethane	20	17.75			89		72-127		
Ethylbenzene	20	18.77			94		78-120		
Isopropylbenzene	20	19.52			98		80-120		
Methyl Tertiary Butyl Ether	20	16.29			81		75-120		
Toluene	20	18.64			93		80-120		
1,2,4-Trimethylbenzene	20	20.1			100		75-120		
1,3,5-Trimethylbenzene	20	19.48			97		75-120		
Xylene (Total)	60	57.33			96		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16132WAK026	Sample number(s): 8373129-8373138,8373140								
Anthracene	1.00	0.890	1.00	0.875	89	88	69-120	2	30
Benzo(a)anthracene	1.00	0.832	1.00	0.825	83	83	71-118	1	30
Benzo(a)pyrene	1.00	0.850	1.00	0.838	85	84	70-120	1	30
Benzo(b)fluoranthene	1.00	0.910	1.00	0.893	91	89	76-132	2	30
Benzo(g,h,i)perylene	1.00	0.790	1.00	0.775	79	78	58-129	2	30
Chrysene	1.00	0.837	1.00	0.831	84	83	66-119	1	30
Fluorene	1.00	0.832	1.00	0.815	83	82	69-116	2	30
Naphthalene	1.00	0.819	1.00	0.803	82	80	61-112	2	30
Phenanthrene	1.00	0.921	1.00	0.903	92	90	69-113	2	30
Pyrene	1.00	0.821	1.00	0.805	82	80	64-115	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161330026A	Sample number(s): 8373129-8373140								
Ethylene dibromide	0.128	0.134	0.128	0.129	105	101	60-140	4	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161376050002A	Sample number(s): 8373129-8373138,8373140								
Lead	0.0150	0.0155			103		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/23/2016 19:26

Group Number: 1659064

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: D161341AA	Sample number(s): 8373136-8373140 UNSPK: 8373138									
Benzene	N.D.	20	19.14	20	18.12	96	91	78-120	5	30
1,2-Dichloroethane	N.D.	20	17.8	20	16.86	89	84	72-127	5	30
Ethylbenzene	N.D.	20	20.33	20	19.53	102	98	78-120	4	30
Isopropylbenzene	N.D.	20	21.12	20	20.15	106	101	80-120	5	30
Methyl Tertiary Butyl Ether	N.D.	20	18.22	20	16.95	91	85	75-120	7	30
Toluene	N.D.	20	20.16	20	18.95	101	95	80-120	6	30
1,2,4-Trimethylbenzene	N.D.	20	20.49	20	19.46	102	97	75-120	5	30
1,3,5-Trimethylbenzene	N.D.	20	20.04	20	19.3	100	97	75-120	4	30
Xylene (Total)	N.D.	60	62.79	60	59.45	105	99	80-120	5	30
Batch number: D161342AA	Sample number(s): 8373129-8373135 UNSPK: P370270									
Benzene	3.94	20	22.86	20	23.08	95	96	78-120	1	30
1,2-Dichloroethane	N.D.	20	20.14	20	18.61	101	93	72-127	8	30
Ethylbenzene	N.D.	20	20.6	20	20.94	103	105	78-120	2	30
Isopropylbenzene	4.82	20	26.46	20	26.89	108	110	80-120	2	30
Methyl Tertiary Butyl Ether	1.53	20	23.57	20	20.43	110	95	75-120	14	30
Toluene	N.D.	20	18.92	20	20.46	95	102	80-120	8	30
1,2,4-Trimethylbenzene	N.D.	20	21.08	20	21.55	105	108	75-120	2	30
1,3,5-Trimethylbenzene	N.D.	20	20.79	20	21.17	104	106	75-120	2	30
Xylene (Total)	N.D.	60	63.7	60	64.37	106	107	80-120	1	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161330026A	Sample number(s): 8373129-8373140 UNSPK: 8373129									
Ethylene dibromide	N.D.	0.125	0.124			99		60-140		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 161376050002A	Sample number(s): 8373129-8373138,8373140 UNSPK: 8373135									
Lead	0.00134	0.0150	0.0180	0.0150	0.0178	111	110	75-125	1	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 161330026A	Sample number(s): 8373129-8373140 BKG: 8373130			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	mg/l	mg/l		
Batch number: 161376050002A	Sample number(s): 8373129-8373138,8373140 BKG: 8373135			
Lead	0.00134	0.00145	7 (1)	20

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/23/2016 19:26

Group Number: 1659064

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: D161341AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8373136	99	94	101	100
8373137	99	97	101	103
8373138	101	94	100	100
8373139	101	93	100	98
8373140	99	95	101	101
Blank	101	94	101	100
LCS	101	97	99	101
MS	100	97	100	102
MSD	100	95	101	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: D161342AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8373129	98	97	99	101
8373130	101	95	95	106
8373131	99	99	100	99
8373132	99	95	99	104
8373133	102	95	103	101
8373134	89	96	100	101
8373135	97	96	101	105
Blank	100	97	101	99
LCS	99	96	101	101
MS	102	100	95	105
MSD	98	98	102	103
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 16132WAK026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8373129	90	76	76
8373130	110	66	89
8373131	85	74	74
8373132	88	62	91
8373133	93	78	75
8373134	124	77	82
8373135	183*	88	80
8373136	69	73	78
8373137	83	67	77
8373138	68	68	76
8373140	100	73	83
Blank	92	85	73
LCS	93	86	77
LCSD	91	85	75

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/23/2016 19:26

Group Number: 1659064

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Limits: 50-133 41-137 43-126

Analysis Name: EDB in Wastewater
Batch number: 161330026A

	1,1,2,2-Tetrachloroethane
8373129	109
8373130	120
8373131	105
8373132	120
8373133	117
8373134	116
8373135	115
8373136	106
8373137	111
8373138	108
8373139	69
8373140	108
Blank	95
DUP	123
LCS	100
LCSD	95
MS	106
Limits:	46-136

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1659064 Sample # 8373129-40

COC # 500119

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philly / 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Water: Ground	Water: Potable	Water: Surface	Water: NPDES	Other:	Total # of Containers	Lead	Select VOCs 8260	Select SVOCs 8270 SIM	EDB Soil							Remarks
GW-11109613-B169-05-09-16-MM-024	5-09-16	1000	X					X					8	1	3	2	2							
GW-11109613-B152-05-09-16-AC-025		1210	X					X					8	1	3	2	2							
GW-11109613-URS4-05-09-16-MM-026		1400	X					X					8	1	3	2	2							
GW-11109613-DUP3-05-09-16-AC-027		1230	X					X					8	1	3	2	2							
GW-11109613-URS1-05-09-16-MM-028		1330	X					X					8	1	3	2	2							
GW-11109613-B145-05-09-16-AC-029		1315	X					X					9	2	3	2	2							QAQC
GW-11109613-URS3-05-09-16-MM-030		1535	X					X					8	1	3	2	2							
GW-11109613-B164-05-09-16-AC-031		1700	X					X					8	1	3	2	2							
GW-11109613-B125-05-09-16-MM-032		1730	X					X					8	1	3	2	2							
GW-11109613-B158-05-09-16-AC-033		1530	X					X					8	1	3	2	2							

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	5-10-16	1045	[signature]	5-10-16	1045
[signature]	5-10-16	1607			
			[signature]	5-10-16	1605

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 16.2.4 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1659064 Sample # 8373129-40

COC # 499227

Client Information

Client: Evergreen
Acct. #:
Project Name/#: Evergreen Philly
PWSID #:
Project Manager: David Steele
P.O. #:
Sampler: Alissa Cannon
Quote #:
State where samples were collected: Pennsylvania
For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#: 187581

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Lead	Select VOCs 8260	Select 8VOCs 8270 SIM	EDB 8011	Remarks
TB-11109613-05-10-16-AG-034	05-10-16	1000				X		4		2		2	
GW-11109613-B126-05-10-16-MM-035	05/10/16	0945	X					8	1	3	2	2	3 Select VOCs 8260 AC

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage [signature]	4-14-16	0918			
[signature]	5-10-16	1045	[signature]	5-10-16	1045
[signature]	5-10-16	1608			
			[signature]	5-10-16	1605

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.6-2.4°C

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Sample Administration Receipt Documentation Log

Doc Log ID: 145949

Group Number(s): 1659064

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	05/10/2016 16:05
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	No	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	4
Samples Intact:	Yes	Trip Blank Type:	HCL
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Joseph Huber (7831) at 16:42 on 05/10/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.6	DT	Wet	Y	Bagged	N
2	DT121	2.4	DT	Wet	Y	Bagged	N

General Comments: Recv'd metals batch QC for 029

2425 New Holland Pike
Lancaster, PA 17605-2425

T 717-656-2300
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: May 27, 2016

Project: Philadelphia Refinery

Submittal Date: 05/12/2016
Group Number: 1660120
SDG: MHF36
PO Number: 11109613
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
GW-11109613-B154-05-10-16-MM-036 Grab Groundwater	8378032
GW-11109613-B163-05-10-16-AC-037 Grab Groundwater	8378033
TB-11109613-05-10-16-AC-038 Water	8378034
GW-11109613-B162-05-10-16-AC-039 Grab Groundwater	8378035
GW-11109613-URS5-05-10-16-MM-040 Grab Groundwater	8378036
GW-11109613-B134-05-11-16-MM-041 Grab Groundwater	8378037
GW-11109613-B132-05-11-16-AC-042 Grab Groundwater	8378038
GW-11109613-B39-05-11-16-MM-043 Grab Groundwater	8378039
GW-11109613-B144-05-11-16-AC-044 Grab Groundwater	8378040
GW-11109613-B175-05-11-16-MM-045 Grab Groundwater	8378041
GW-11109613-B150-05-11-16-AC-046 Grab Groundwater	8378042
GW-11109613-B154-05-10-16-MM-038 Grab Groundwater	8378043

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: GW-11109613-B154-05-10-16-MM-036 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378032
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 11:10 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH361 SDG#: MHF36-01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	49	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	4	1	0.5	1
10945	Isopropylbenzene	98-82-8	120	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	13	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	4	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	5	2	0.5	1
10945	Xylene (Total)	1330-20-7	22	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	4.7	0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	1.7	0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	1.4	0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	1.5	0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.50	0.052	0.010	1
08357	Chrysene	218-01-9	1.4	0.052	0.010	1
08357	Fluorene	86-73-7	10	0.052	0.010	1
08357	Naphthalene	91-20-3	3.3	0.062	0.031	1
08357	Phenanthrene	85-01-8	17	0.62	0.31	10
08357	Pyrene	129-00-0	3.4	0.052	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 14:23	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 14:23	Brett W Kenyon	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 10:48	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 22:55	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1

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Analysis Report

Sample Description: GW-11109613-B154-05-10-16-MM-036 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378032
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 11:10 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH361 SDG#: MHF36-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 12:25	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 18:55	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-B163-05-10-16-AC-037 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378033
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 12:40 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH362 SDG#: MHF36-02

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	0.9	J	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.044	J	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.097		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.090		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.17		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.064		0.051	0.010	1
08357	Chrysene	218-01-9	0.13		0.051	0.010	1
08357	Fluorene	86-73-7	1.2		0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.061	0.031	1
08357	Phenanthrene	85-01-8	0.037	J	0.061	0.031	1
08357	Pyrene	129-00-0	0.27		0.051	0.010	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 14:48	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 14:48	Brett W Kenyon	1

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Analysis Report

Sample Description: GW-11109613-B163-05-10-16-AC-037 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378033
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 12:40 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH362 SDG#: MHF36-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 11:18	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 13:28	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 18:45	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-05-10-16-AC-038 Water
Philadelphia Refinery

LL Sample # WW 8378034
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 16:00

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH363 SDG#: MHF36-03TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 12:23	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 12:23	Brett W Kenyon	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 13:59	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1

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Analysis Report

Sample Description: GW-11109613-B162-05-10-16-AC-039 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8378035
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 14:30 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

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Suite #3
Niagara Falls NY 14304

MH364 SDG#: MHF36-04

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.62	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.41	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.32	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.34	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.17	0.051	0.010	1
08357	Chrysene	218-01-9	0.47	0.051	0.010	1
08357	Fluorene	86-73-7	1.4	0.051	0.010	1
08357	Naphthalene	91-20-3	0.61	0.061	0.030	1
08357	Phenanthrene	85-01-8	0.56	0.061	0.030	1
08357	Pyrene	129-00-0	1.1	0.051	0.010	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0094	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00031 J	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 15:12	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 15:12	Brett W Kenyon	1

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Analysis Report

Sample Description: GW-11109613-B162-05-10-16-AC-039 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378035
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 14:30 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH364 SDG#: MHF36-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 11:47	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 14:14	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 18:57	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

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Analysis Report

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Sample Description: GW-11109613-URS5-05-10-16-MM-040 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378036
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 16:50 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH365 SDG#: MHF36-05

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	4,000		25	13	25
10945	1,2-Dichloroethane	107-06-2	N.D.		25	13	25
10945	Ethylbenzene	100-41-4	560		25	13	25
10945	Isopropylbenzene	98-82-8	22	J	50	13	25
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		25	13	25
10945	Toluene	108-88-3	8,600		250	130	250
10945	1,2,4-Trimethylbenzene	95-63-6	190		50	13	25
10945	1,3,5-Trimethylbenzene	108-67-8	56		50	13	25
10945	Xylene (Total)	1330-20-7	3,000		25	13	25
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	5.6		0.51	0.10	10
08357	Benzo(a)anthracene	56-55-3	0.96		0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	0.27	J	0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	0.24	J	0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	N.D.		0.51	0.10	10
08357	Chrysene	218-01-9	0.53		0.51	0.10	10
08357	Fluorene	86-73-7	14		0.51	0.10	10
08357	Naphthalene	91-20-3	260		6.1	3.0	100
08357	Phenanthrene	85-01-8	20		0.61	0.30	10
08357	Pyrene	129-00-0	3.5		0.51	0.10	10
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 17:12	Brett W Kenyon	25
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 17:36	Brett W Kenyon	250
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 17:12	Brett W Kenyon	25
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Z161372AA	05/16/2016 17:36	Brett W Kenyon	250
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 23:25	Catherine E Bachman	10

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Analysis Report

Sample Description: GW-11109613-URS5-05-10-16-MM-040 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378036
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 16:50 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH365 SDG#: MHF36-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/25/2016 12:35	Catherine E Bachman	100
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 14:30	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:02	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B134-05-11-16-MM-041 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378037
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 10:00 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH366 SDG#: MHF36-06

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	2		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	100		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	0.6	J	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	0.7	J	2	0.5	1
10945	Xylene (Total)	1330-20-7	0.5	J	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	2.0		0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.46		0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.25		0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.30		0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.075		0.052	0.010	1
08357	Chrysene	218-01-9	0.39		0.052	0.010	1
08357	Fluorene	86-73-7	8.7		0.052	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.062	0.031	1
08357	Phenanthrene	85-01-8	7.1		0.062	0.031	1
08357	Pyrene	129-00-0	1.8		0.052	0.010	1
	The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.						
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 15:36	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 15:36	Brett W Kenyon	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 12:47	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B134-05-11-16-MM-041 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378037
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 10:00 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH366 SDG#: MHF36-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 14:45	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:03	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: GW-11109613-B132-05-11-16-AC-042 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378038
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 09:20 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH367 SDG#: MHF36-07

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	8	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	13	0.51	0.10	10
08357	Benzo(a)anthracene	56-55-3	7.7	0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	4.4	0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	5.6	0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	1.5	0.51	0.10	10
08357	Chrysene	218-01-9	5.1	0.51	0.10	10
08357	Fluorene	86-73-7	51	0.51	0.10	10
08357	Naphthalene	91-20-3	1.4	0.61	0.31	10
08357	Phenanthrene	85-01-8	74	0.61	0.31	10
08357	Pyrene	129-00-0	19	0.51	0.10	10
Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 16:00	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 16:00	Brett W Kenyon	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 23:55	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 15:01	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B132-05-11-16-AC-042 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378038
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 09:20 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH367 SDG#: MHF36-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:05	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-B39-05-11-16-MM-043 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378039
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 11:25 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH368 SDG#: MHF36-08

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	3		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	11		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	0.7	J	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	4		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	5.8		0.50	0.10	10
08357	Benzo(a)anthracene	56-55-3	3.0		0.50	0.10	10
08357	Benzo(a)pyrene	50-32-8	2.5		0.50	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	3.1		0.50	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	1.5		0.50	0.10	10
08357	Chrysene	218-01-9	2.6		0.50	0.10	10
08357	Fluorene	86-73-7	14		0.50	0.10	10
08357	Naphthalene	91-20-3	8.0		0.60	0.30	10
08357	Phenanthrene	85-01-8	25		0.60	0.30	10
08357	Pyrene	129-00-0	6.4		0.50	0.10	10
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0167		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 16:24	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 16:24	Brett W Kenyon	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/25/2016 00:25	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 15:16	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B39-05-11-16-MM-043 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8378039
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 11:25 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH368 SDG#: MHF36-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:07	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

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Analysis Report

Sample Description: GW-11109613-B144-05-11-16-AC-044 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8378040
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 12:30 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH369 SDG#: MHF36-09

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	130	5	3	5
10945	1,2-Dichloroethane	107-06-2	N.D.	5	3	5
10945	Ethylbenzene	100-41-4	260	5	3	5
10945	Isopropylbenzene	98-82-8	35	10	3	5
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	3	5
10945	Toluene	108-88-3	74	5	3	5
10945	1,2,4-Trimethylbenzene	95-63-6	460	10	3	5
10945	1,3,5-Trimethylbenzene	108-67-8	140	10	3	5
10945	Xylene (Total)	1330-20-7	1,600	5	3	5
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	5.4	0.50	0.10	10
08357	Benzo(a)anthracene	56-55-3	2.0	0.50	0.10	10
08357	Benzo(a)pyrene	50-32-8	1.2	0.50	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	1.6	0.50	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	0.42 J	0.50	0.10	10
08357	Chrysene	218-01-9	2.0	0.50	0.10	10
08357	Fluorene	86-73-7	1.1	0.50	0.10	10
08357	Naphthalene	91-20-3	19	0.60	0.30	10
08357	Phenanthrene	85-01-8	6.6	0.60	0.30	10
08357	Pyrene	129-00-0	4.3	0.50	0.10	10

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was re-analyzed and internal standard areas are again outside of the QC acceptance limits, indicating a matrix effect. The reported data is from the initial analysis of the sample.

Pesticides/PCBs	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00024 J	0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 18:00	Brett W Kenyon	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 18:00	Brett W Kenyon	5

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B144-05-11-16-AC-044 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378040
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 12:30 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH369 SDG#: MHF36-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/25/2016 00:54	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 15:32	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:09	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: GW-11109613-B175-05-11-16-MM-045 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378041
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 13:50 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH360 SDG#: MHF36-10

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	260		5	3	5
10945	1,2-Dichloroethane	107-06-2	N.D.		5	3	5
10945	Ethylbenzene	100-41-4	25		5	3	5
10945	Isopropylbenzene	98-82-8	150		10	3	5
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	3	5
10945	Toluene	108-88-3	70		5	3	5
10945	1,2,4-Trimethylbenzene	95-63-6	4	J	10	3	5
10945	1,3,5-Trimethylbenzene	108-67-8	51		10	3	5
10945	Xylene (Total)	1330-20-7	33		5	3	5
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.7		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	1.3		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.89		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	1.1		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.38		0.051	0.010	1
08357	Chrysene	218-01-9	1.2		0.051	0.010	1
08357	Fluorene	86-73-7	5.9		0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.061	0.030	1
08357	Phenanthrene	85-01-8	8.7		0.061	0.030	1
08357	Pyrene	129-00-0	2.3		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0069		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 18:24	Brett W Kenyon	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 18:24	Brett W Kenyon	5
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 14:47	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 16:19	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B175-05-11-16-MM-045 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8378041
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 13:50 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

MH360 SDG#: MHF36-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:10	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B150-05-11-16-AC-046 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378042
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 15:15 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3611 SDG#: MHF36-11

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	480,000		20,000	10,000	20000
10945	1,2-Dichloroethane	107-06-2	N.D.		200	100	200
10945	Ethylbenzene	100-41-4	320		200	100	200
10945	Isopropylbenzene	98-82-8	12,000		400	100	200
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		200	100	200
10945	Toluene	108-88-3	55,000		2,000	1,000	2000
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		400	100	200
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		400	100	200
10945	Xylene (Total)	1330-20-7	1,400		200	100	200
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.86		0.52	0.10	10
08357	Benzo(a)anthracene	56-55-3	0.52		0.52	0.10	10
08357	Benzo(a)pyrene	50-32-8	0.40	J	0.52	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	0.53		0.52	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	0.22	J	0.52	0.10	10
08357	Chrysene	218-01-9	0.53		0.52	0.10	10
08357	Fluorene	86-73-7	2.8		0.52	0.10	10
08357	Naphthalene	91-20-3	52		0.62	0.31	10
08357	Phenanthrene	85-01-8	4.5		0.62	0.31	10
08357	Pyrene	129-00-0	0.93		0.52	0.10	10
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0097	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 18:48	Brett W Kenyon	200
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 19:12	Brett W Kenyon	2000
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161381AA	05/17/2016 19:19	Brett W Kenyon	20000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 18:48	Brett W Kenyon	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Z161372AA	05/16/2016 19:12	Brett W Kenyon	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	3	Z161381AA	05/17/2016 19:19	Brett W Kenyon	20000

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B150-05-11-16-AC-046 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378042
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/11/2016 15:15 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3611 SDG#: MHF36-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/25/2016 01:24	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 16:34	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:12	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B154-05-10-16-MM-038 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378043
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 12:15 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3612 SDG#: MHF36-12

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	51,000		2,000	1,000	2000
10945	1,2-Dichloroethane	107-06-2	N.D.		200	100	200
10945	Ethylbenzene	100-41-4	N.D.		200	100	200
10945	Isopropylbenzene	98-82-8	150	J	400	100	200
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		200	100	200
10945	Toluene	108-88-3	180	J	200	100	200
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		400	100	200
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		400	100	200
10945	Xylene (Total)	1330-20-7	N.D.		200	100	200
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.5		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.12		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.10		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.084		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.054		0.051	0.010	1
08357	Chrysene	218-01-9	0.099		0.051	0.010	1
08357	Fluorene	86-73-7	7.0		0.051	0.010	1
08357	Naphthalene	91-20-3	20		0.62	0.31	10
08357	Phenanthrene	85-01-8	4.9		0.062	0.031	1
08357	Pyrene	129-00-0	0.51		0.051	0.010	1
Pesticides/PCBs	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.00013	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 19:36	Brett W Kenyon	200
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z161372AA	05/16/2016 20:00	Brett W Kenyon	2000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z161372AA	05/16/2016 19:36	Brett W Kenyon	200
01163	GC/MS VOA Water Prep	SW-846 5030B	2	Z161372AA	05/16/2016 20:00	Brett W Kenyon	2000
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/24/2016 15:46	Catherine E Bachman	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B154-05-10-16-MM-038 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8378043
LL Group # 1660120
Account # 10177

Project Name: Philadelphia Refinery

Collected: 05/10/2016 12:15 by AC

Submitted: 05/12/2016 16:00
Reported: 05/27/2016 08:57

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M3612 SDG#: MHF36-12

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16134WAA026	05/25/2016 01:54	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16134WAA026	05/13/2016 16:00	Ryan A Schafran	1
10398	EDB in Wastewater	SW-846 8011	1	161380008A	05/19/2016 16:50	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	161380008A	05/17/2016 18:15	Shawn J McMullen	1
06035	Lead	SW-846 6020	1	161396050002A	05/20/2016 19:14	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	161396050002	05/19/2016 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/27/2016 08:57

Group Number: 1660120

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Batch number: Z161372AA	Sample number(s): 8378032-8378043		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: Z161381AA	Sample number(s): 8378042		
Benzene	N.D.	1	0.5
Batch number: 16134WAA026	Sample number(s): 8378032-8378033,8378035-8378043		
Anthracene	N.D.	0.050	0.010
Benzo(a)anthracene	N.D.	0.050	0.010
Benzo(a)pyrene	N.D.	0.050	0.010
Benzo(b)fluoranthene	N.D.	0.050	0.010
Benzo(g,h,i)perylene	N.D.	0.050	0.010
Chrysene	N.D.	0.050	0.010
Fluorene	N.D.	0.050	0.010
Naphthalene	N.D.	0.060	0.030
Phenanthrene	N.D.	0.060	0.030
Pyrene	N.D.	0.050	0.010
Batch number: 161380008A	Sample number(s): 8378032-8378043		
Ethylene dibromide	N.D.	0.030	0.010
	mg/l	mg/l	mg/l
Batch number: 161396050002A	Sample number(s): 8378032-8378033,8378035-8378043		
Lead	N.D.	0.0010	0.00013

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Z161372AA	Sample number(s): 8378032-8378043								
Benzene	20	18.42	20	18.77	92	94	78-120	2	30
1,2-Dichloroethane	20	18.83	20	19.18	94	96	72-127	2	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/27/2016 08:57

Group Number: 1660120

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Ethylbenzene	20	18.18	20	18.61	91	93	78-120	2	30
Isopropylbenzene	20	18.42	20	19.34	92	97	80-120	5	30
Methyl Tertiary Butyl Ether	20	19.63	20	19.86	98	99	75-120	1	30
Toluene	20	19.09	20	19.58	95	98	80-120	3	30
1,2,4-Trimethylbenzene	20	17.51	20	18.02	88	90	75-120	3	30
1,3,5-Trimethylbenzene	20	17.45	20	17.8	87	89	75-120	2	30
Xylene (Total)	60	56.5	60	58.2	94	97	80-120	3	30
Batch number: Z161381AA	Sample number(s): 8378042								
Benzene	20	18.14	20	18.15	91	91	78-120	0	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16134WAA026	Sample number(s): 8378032-8378033,8378035-8378043								
Anthracene	1.00	0.840	1.00	0.693	84	69	69-120	19	30
Benzo(a)anthracene	1.00	0.817	1.00	0.801	82	80	71-118	2	30
Benzo(a)pyrene	1.00	0.845	1.00	0.713	84	71	70-120	17	30
Benzo(b)fluoranthene	1.00	0.882	1.00	0.829	88	83	76-132	6	30
Benzo(g,h,i)perylene	1.00	0.789	1.00	0.709	79	71	58-129	11	30
Chrysene	1.00	0.841	1.00	0.776	84	78	66-119	8	30
Fluorene	1.00	0.799	1.00	0.765	80	76	69-116	4	30
Naphthalene	1.00	0.786	1.00	0.787	79	79	61-112	0	30
Phenanthrene	1.00	0.905	1.00	0.836	91	84	69-113	8	30
Pyrene	1.00	0.838	1.00	0.759	84	76	64-115	10	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161380008A	Sample number(s): 8378032-8378043								
Ethylene dibromide	0.128	0.128	0.128	0.142	100	111	60-140	10	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161396050002A	Sample number(s): 8378032-8378033,8378035-8378043								
Lead	0.0150	0.0153			102		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: Z161381AA	Sample number(s): 8378042 UNSPK: P368417									
Benzene	N.D.	20	19.83	20	19.97	99	100	78-120	1	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161380008A	Sample number(s): 8378032-8378043 UNSPK: 8378032									
Ethylene dibromide	N.D.	0.123	0.125			102		60-140		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/27/2016 08:57

Group Number: 1660120

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 161396050002A	Sample number(s): 8378032-8378033,8378035-8378043 UNSPK: 8378033									
Lead	N.D.	0.0150	0.0160	0.0150	0.0158	107	105	75-125	1	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 161380008A	Sample number(s): 8378032-8378043 BKG: 8378033			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	mg/l	mg/l		
Batch number: 161396050002A	Sample number(s): 8378032-8378033,8378035-8378043 BKG: 8378033			
Lead	N.D.	N.D.	0 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: Z161372AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8378032	97	93	98	100
8378033	102	100	96	90
8378034	103	99	96	89
8378035	101	98	96	92
8378036	99	96	95	93
8378037	98	97	97	98
8378038	101	96	95	95
8378039	97	94	97	97
8378040	99	97	97	96
8378041	97	95	98	97
8378042	95	93	98	96
8378043	97	95	97	89
Blank	101	99	96	89
LCS	99	98	97	97
LCSD	98	98	97	97
Limits:	80-116	77-113	80-113	78-113

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 05/27/2016 08:57

Group Number: 1660120

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAHs in waters by SIM
Batch number: 16134WAA026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8378032	105	59	105
8378033	51	32*	51
8378035	68	38*	76
8378036	74	73	107
8378037	132	70	172*
8378038	128	83	103
8378039	149*	78	122
8378040	99	72	87
8378041	107	80	105
8378042	75	75	89
8378043	93	69	95
Blank	85	74	71
LCS	84	82	74
LCSD	71	69	71
Limits:	50-133	41-137	43-126

Analysis Name: EDB in Wastewater
Batch number: 161380008A

	1,1,2,2-Tetrachloroethane
8378032	109
8378033	104
8378034	113
8378035	105
8378036	156*
8378037	116
8378038	105
8378039	98
8378040	104
8378041	111
8378042	103
8378043	114
Blank	122
DUP	106
LCS	101
LCSD	100
MS	101
Limits:	46-136

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1660120 Sample # 8378032-43

COC # 499228

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philly / 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix

Sediment ☐ Soil ☐ Potable ☐ Ground ☒ Water ☐ Surface ☐ NPDES ☐ Other: ____

Analysis Requested

Preservation Codes

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

Remarks

1 of 2

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	Lead	Select VOCs 8260	EDB 8011	Select SVOCs 8270 SIM
GW-11109613-B154-05-10-16-MM-036	05-10-16		X		8	1	3	2	2
GW-11109613-B163-05-10-16-AC-037		1240	X		8	1	3	2	2
TB-11109613-05-10-16-AC-038		1600			4		2	2	
GW-11109613-B162-05-10-16-AC-039		1430	X		8	1	3	2	2
GW-11109613-URS5-05-10-16-MM-040			X		8	1	3	2	2
GW-11109613-B134-05-11-16-MM-041	05-11-16	1000	X		8	1	3	2	2
GW-11109613-B132-05-11-16-AC-042		0920	X		8	1	3	2	2
GW-11109613-B39-05-11-16-MM-043		1125	X		8	1	3	2	2
GW-11109613-B144-05-11-16-AC-044		1230	X		8	1	3	2	2
GW-11109613-B175-05-11-16-MM-045		1350	X		8	1	3	2	2

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	5/11/16	1700	[signature]	5/12/16	1008
[signature]	5/12/16	1600			
			[signature]	5/12/16	1600

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.5-2.5 °C

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1660120 Sample # 8378032-43

COC # 499229

Client Information

Client: Evergreen

Acct. #:

Project Name#: Evergreen Philly 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Other: ____

Analysis Requested

Preservation Codes

For Lab Use Only

FSC: ____

SCR#: ____

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Water	Other	Total # of Containers	Lead	Select VOCs 8260	EDB 8011	Select SVOCs 8270 SIM								Remarks
GW-11109613-B15D-05-11-16-AC-0416	05-11-16	15:15	x				x		8	1	3	2	2								2 of 2

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

2 of 2

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	05/11/16	1700	[signature]	5-12-16	1000
[signature]	5/12/16	1600			
			[signature]	5/12/16	1600

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.5-2.5 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 146367

Group Number(s): 1160120

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	05/12/2016 16:00
Number of Packages:	2	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	No
Custody Seal Present:	No	Sample Date/Times match COC:	No
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	4
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	Yes		
Discrepancy in Container Qty on COC:	Yes		

Unpacked by Patrick Engle (3472) at 19:57 on 05/12/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	2.5	DT	Wet	Y	Bagged	N
2	DT121	1.5	DT	Wet	Y	Bagged	N

Extra Sample Details

Sample ID on Label	Number of Extra Containers	Date on Label	Comments
GW-11109613-B-154-05-10-16-MM-038	8	5/10/2016 12:15	

Container Quantity Discrepancy Details

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
GW-11109613-B163-05-10-16-AC-037	9	8	Received Metals Batch QC not listed on COC

Sample ID Discrepancy Details

Sample ID on COC	Sample ID on Label	Comments
GW-11109613-B154-05-10-16-M-036	GW-11109613-B156-05-10-16-M-036	

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Sample Administration Receipt Documentation Log

Doc Log ID: 146367

Group Number(s): 1660120

Client: Evergreen

Sample Date/Time Discrepancy Details

Sample ID on COC	Date/Time on Label	Comments
GW-11109613-B154-05-10-16-MM-036	5/10/2016 11:10	No Time on COC
GW-11109613-URS5-05-10-16-MM-040	5/10/2016 16:50	No Time on COC

2425 New Holland Pike
Lancaster, PA 17605-2425

T 717-656-2300
F 717-656-2681
www.LancasterLabs.cor

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: August 02, 2016

Project: Philadelphia Refinery

Submittal Date: 07/14/2016
Group Number: 1682991
SDG: MHF55
PO Number: 11109626
State of Sample Origin: DE

Client Sample Description	Lancaster Labs (LL) #
AOI6-BH-16-016-0-2-071116 Grab Soil	8475486
AOI6-BH-16-016-2-4-071116 Grab Soil	8475487
AOI6-BH-16-015-0-2-071116 Grab Soil	8475488
AOI6-BH-16-015-2-4-071116 Grab Soil	8475489
AOI6-BH-16-014-0-2-071116 Grab Soil	8475490
AOI6-BH-16-014-2-4-071116 Grab Soil	8475491
AOI6-BH-172-0-2-071216 Grab Soil	8475492
AOI6-BH-172-2-4-071216 Grab Soil	8475493
AOI6-BH-173-0-2-071216 Grab Soil	8475494
AOI6-BH-173-2-4-071316 Grab Soil	8475495
AOI6-BH-174-0-2-071316 Grab Soil	8475496
AOI6-BH-174-2-4-071316 Grab Soil	8475497
AOI6-BH-175-0-2-071316 Grab Soil	8475498
AOI6-BH-175-2-4-071316 Grab Soil	8475499

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Arlie Weigley
Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-BH-16-016-0-2-071116 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475486
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/11/2016 15:56 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5501 SDG#: MHF55-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	1,900	240	46	10
10727	Benzo(a)anthracene	56-55-3	1,700	240	46	10
10727	Benzo(a)pyrene	50-32-8	1,700	240	46	10
10727	Benzo(b)fluoranthene	205-99-2	2,300	240	46	10
10727	Benzo(g,h,i)perylene	191-24-2	1,600	240	46	10
10727	Chrysene	218-01-9	2,000	240	46	10
10727	Fluorene	86-73-7	5,100	240	46	10
10727	Naphthalene	91-20-3	9,300	240	46	10
10727	Phenanthrene	85-01-8	9,600	240	46	10
10727	Pyrene	129-00-0	2,400	240	46	10
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	29.2	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 03:12	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-016-2-4-071116 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475487
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/11/2016 16:15 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5502 SDG#: MHF55-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	3,400	250	49	10
10727	Benzo(a)anthracene	56-55-3	3,300	250	49	10
10727	Benzo(a)pyrene	50-32-8	3,300	250	49	10
10727	Benzo(b)fluoranthene	205-99-2	3,600	250	49	10
10727	Benzo(g,h,i)perylene	191-24-2	3,500	250	49	10
10727	Chrysene	218-01-9	3,700	250	49	10
10727	Fluorene	86-73-7	6,300	250	49	10
10727	Naphthalene	91-20-3	18,000	250	49	10
10727	Phenanthrene	85-01-8	17,000	250	49	10
10727	Pyrene	129-00-0	4,200	250	49	10
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	32.3	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 03:33	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-015-0-2-071116 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475488
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/11/2016 16:52 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5503 SDG#: MHF55-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	5,400		2,100	410	10
10727	Benzo(a)anthracene	56-55-3	2,000	J	2,100	410	10
10727	Benzo(a)pyrene	50-32-8	1,600	J	2,100	410	10
10727	Benzo(b)fluoranthene	205-99-2	2,900		2,100	410	10
10727	Benzo(g,h,i)perylene	191-24-2	2,200		2,100	410	10
10727	Chrysene	218-01-9	5,800		2,100	410	10
10727	Fluorene	86-73-7	7,400		2,100	410	10
10727	Naphthalene	91-20-3	2,800		2,100	410	10
10727	Phenanthrene	85-01-8	16,000		2,100	410	10
10727	Pyrene	129-00-0	8,400		2,100	410	10
Reporting limits were raised due to interference from the sample matrix.							
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	19.9		0.50	0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.							

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 03:53	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-015-2-4-071116 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475489
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/11/2016 17:03 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5504 SDG#: MHF55-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,300	240	48	10
10727	Benzo(a)anthracene	56-55-3	1,200	240	48	10
10727	Benzo(a)pyrene	50-32-8	1,200	240	48	10
10727	Benzo(b)fluoranthene	205-99-2	1,200	240	48	10
10727	Benzo(g,h,i)perylene	191-24-2	1,600	240	48	10
10727	Chrysene	218-01-9	2,400	240	48	10
10727	Fluorene	86-73-7	2,600	240	48	10
10727	Naphthalene	91-20-3	6,300	240	48	10
10727	Phenanthrene	85-01-8	7,200	240	48	10
10727	Pyrene	129-00-0	3,200	240	48	10
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	30.5	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 04:14	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-014-0-2-071116 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475490
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/11/2016 17:35 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5505 SDG#: MHF55-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	6,200	1,300	250	10
10727	Benzo(a)anthracene	56-55-3	7,800	1,300	250	10
10727	Benzo(a)pyrene	50-32-8	8,300	1,300	250	10
10727	Benzo(b)fluoranthene	205-99-2	8,200	1,300	250	10
10727	Benzo(g,h,i)perylene	191-24-2	6,300	1,300	250	10
10727	Chrysene	218-01-9	8,900	1,300	250	10
10727	Fluorene	86-73-7	9,300	1,300	250	10
10727	Naphthalene	91-20-3	21,000	1,300	250	10
10727	Phenanthrene	85-01-8	24,000	1,300	250	10
10727	Pyrene	129-00-0	12,000	1,300	250	10
	Reporting limits were raised due to interference from the sample matrix.					
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	34.4	0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 04:34	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-16-014-2-4-071116 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475491
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/11/2016 17:45 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5506 SDG#: MHF55-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	12,000	1,300	250	10
10727	Benzo(a)anthracene	56-55-3	25,000	1,300	250	10
10727	Benzo(a)pyrene	50-32-8	26,000	1,300	250	10
10727	Benzo(b)fluoranthene	205-99-2	26,000	1,300	250	10
10727	Benzo(g,h,i)perylene	191-24-2	15,000	1,300	250	10
10727	Chrysene	218-01-9	30,000	1,300	250	10
10727	Fluorene	86-73-7	12,000	1,300	250	10
10727	Naphthalene	91-20-3	24,000	1,300	250	10
10727	Phenanthrene	85-01-8	37,000	1,300	250	10
10727	Pyrene	129-00-0	39,000	1,300	250	10
	Reporting limits were raised due to interference from the sample matrix.					
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	34.8	0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 04:54	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-BH-172-0-2-071216 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475492
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/12/2016 15:05 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5507 SDG#: MHF55-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	800		230	45	10
10727	Benzo(a)anthracene	56-55-3	2,400		230	45	10
10727	Benzo(a)pyrene	50-32-8	1,400		230	45	10
10727	Benzo(b)fluoranthene	205-99-2	2,600		230	45	10
10727	Benzo(g,h,i)perylene	191-24-2	950		230	45	10
10727	Chrysene	218-01-9	2,300		230	45	10
10727	Fluorene	86-73-7	79	J	230	45	10
10727	Naphthalene	91-20-3	1,200		230	45	10
10727	Phenanthrene	85-01-8	930		230	45	10
10727	Pyrene	129-00-0	3,000		230	45	10
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	26.2		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 05:15	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Lancaster Laboratories Environmental
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Analysis Report

Sample Description: AOI6-BH-172-2-4-071216 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475493
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/12/2016 15:35 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5508 SDG#: MHF55-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	270	20	4	1
10727	Benzo(a)anthracene	56-55-3	480	20	4	1
10727	Benzo(a)pyrene	50-32-8	360	20	4	1
10727	Benzo(b)fluoranthene	205-99-2	500	20	4	1
10727	Benzo(g,h,i)perylene	191-24-2	230	20	4	1
10727	Chrysene	218-01-9	510	20	4	1
10727	Fluorene	86-73-7	110	20	4	1
10727	Naphthalene	91-20-3	120	20	4	1
10727	Phenanthrene	85-01-8	790	20	4	1
10727	Pyrene	129-00-0	780	20	4	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	16.7	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 05:35	William H Saadeh	1
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-173-0-2-071216 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475494
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/12/2016 17:05 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5509 SDG#: MHF55-09

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	89	J	190	36	10
10727	Benzo(a)anthracene	56-55-3	300		190	36	10
10727	Benzo(a)pyrene	50-32-8	330		190	36	10
10727	Benzo(b)fluoranthene	205-99-2	440		190	36	10
10727	Benzo(g,h,i)perylene	191-24-2	390		190	36	10
10727	Chrysene	218-01-9	420		190	36	10
10727	Fluorene	86-73-7	49	J	190	36	10
10727	Naphthalene	91-20-3	270		190	36	10
10727	Phenanthrene	85-01-8	340		190	36	10
10727	Pyrene	129-00-0	490		190	36	10
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	9.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 08:55	Joseph M Gambler	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-173-2-4-071316 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475495
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/13/2016 11:06 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5510 SDG#: MHF55-10

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	190	J	200	39	10
10727	Benzo(a)anthracene	56-55-3	450		200	39	10
10727	Benzo(a)pyrene	50-32-8	450		200	39	10
10727	Benzo(b)fluoranthene	205-99-2	630		200	39	10
10727	Benzo(g,h,i)perylene	191-24-2	470		200	39	10
10727	Chrysene	218-01-9	650		200	39	10
10727	Fluorene	86-73-7	160	J	200	39	10
10727	Naphthalene	91-20-3	1,200		200	39	10
10727	Phenanthrene	85-01-8	880		200	39	10
10727	Pyrene	129-00-0	810		200	39	10
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	14.4		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 09:15	Joseph M Gambler	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Lancaster Laboratories Environmental
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Analysis Report

Sample Description: AOI6-BH-174-0-2-071316 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475496
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/13/2016 12:00 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5511 SDG#: MHF55-11

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	110	J	210	42	10
10727	Benzo(a)anthracene	56-55-3	600		210	42	10
10727	Benzo(a)pyrene	50-32-8	540		210	42	10
10727	Benzo(b)fluoranthene	205-99-2	710		210	42	10
10727	Benzo(g,h,i)perylene	191-24-2	390		210	42	10
10727	Chrysene	218-01-9	630		210	42	10
10727	Fluorene	86-73-7	N.D.		210	42	10
10727	Naphthalene	91-20-3	180	J	210	42	10
10727	Phenanthrene	85-01-8	400		210	42	10
10727	Pyrene	129-00-0	890		210	42	10
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	21.2		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 09:36	Joseph M Gambler	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-BH-174-2-4-071316 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475497
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/13/2016 12:40 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5512 SDG#: MHF55-12

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**		**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	140	J	200	39	10
10727	Benzo(a)anthracene	56-55-3	630		200	39	10
10727	Benzo(a)pyrene	50-32-8	520		200	39	10
10727	Benzo(b)fluoranthene	205-99-2	650		200	39	10
10727	Benzo(g,h,i)perylene	191-24-2	400		200	39	10
10727	Chrysene	218-01-9	670		200	39	10
10727	Fluorene	86-73-7	41	J	200	39	10
10727	Naphthalene	91-20-3	140	J	200	39	10
10727	Phenanthrene	85-01-8	530		200	39	10
10727	Pyrene	129-00-0	1,000		200	39	10
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	15.1		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 09:56	Joseph M Gambler	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

eurofins
Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-BH-175-0-2-071316 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475498
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/13/2016 13:10 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5513 SDG#: MHF55-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	2,400	280	55	10
10727	Benzo(a)anthracene	56-55-3	1,900	280	55	10
10727	Benzo(a)pyrene	50-32-8	1,400	280	55	10
10727	Benzo(b)fluoranthene	205-99-2	1,900	280	55	10
10727	Benzo(g,h,i)perylene	191-24-2	1,700	280	55	10
10727	Chrysene	218-01-9	2,000	280	55	10
10727	Fluorene	86-73-7	3,600	280	55	10
10727	Naphthalene	91-20-3	9,300	280	55	10
10727	Phenanthrene	85-01-8	10,000	280	55	10
10727	Pyrene	129-00-0	2,800	280	55	10
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	40.2	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 10:17	Joseph M Gambler	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

eurofins
Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-BH-175-2-4-071316 Grab Soil
Philadelphia Refinery

LL Sample # SW 8475499
LL Group # 1682991
Account # 10177

Project Name: Philadelphia Refinery

Collected: 07/13/2016 13:20 by AC

Submitted: 07/14/2016 15:25
Reported: 08/02/2016 12:34

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M5514 SDG#: MHF55-14

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C**		**ug/kg**	**ug/kg**	**ug/kg**	
10727	Anthracene	120-12-7	4,300	240	47	10
10727	Benzo(a)anthracene	56-55-3	5,600	240	47	10
10727	Benzo(a)pyrene	50-32-8	4,400	240	47	10
10727	Benzo(b)fluoranthene	205-99-2	7,700	240	47	10
10727	Benzo(g,h,i)perylene	191-24-2	3,300	240	47	10
10727	Chrysene	218-01-9	5,600	240	47	10
10727	Fluorene	86-73-7	8,400	240	47	10
10727	Naphthalene	91-20-3	3,900	240	47	10
10727	Phenanthrene	85-01-8	22,000	240	47	10
10727	Pyrene	129-00-0	6,300	240	47	10
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	29.6	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10727	TCL 8270 (microwave)	SW-846 8270C	1	16198SLG026	07/20/2016 02:11	William H Saadeh	10
10809	BNA Soil Microwave	SW-846 3546	1	16198SLG026	07/19/2016 08:00	Kayla Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16201820004B	07/19/2016 21:17	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 08/02/2016 12:34

Group Number: 1682991

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ug/kg	LOQ** ug/kg	MDL ug/kg
Batch number: 16198SLG026	Sample number(s): 8475486-8475499		
Anthracene	N.D.	17	3
Benzo(a)anthracene	N.D.	17	3
Benzo(a)pyrene	N.D.	17	3
Benzo(b)fluoranthene	N.D.	17	3
Benzo(g,h,i)perylene	N.D.	17	3
Chrysene	N.D.	17	3
Fluorene	N.D.	17	3
Naphthalene	N.D.	17	3
Phenanthrene	N.D.	17	3
Pyrene	N.D.	17	3

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16198SLG026	Sample number(s): 8475486-8475499								
Anthracene	1666.67	1633.01			98		82-118		
Benzo(a)anthracene	1666.67	1732.91			104		76-119		
Benzo(a)pyrene	1666.67	1545.94			93		85-117		
Benzo(b)fluoranthene	1666.67	1704.18			102		78-129		
Benzo(g,h,i)perylene	1666.67	1540.42			92		77-118		
Chrysene	1666.67	1694.35			102		80-121		
Fluorene	1666.67	1608.25			96		86-118		
Naphthalene	1666.67	1552.8			93		82-112		
Phenanthrene	1666.67	1542.05			93		80-114		
Pyrene	1666.67	1559.17			94		81-114		
	%	%	%	%					
Batch number: 16201820004B	Sample number(s): 8475486-8475499								
Moisture	89.5	89.48			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 08/02/2016 12:34

Group Number: 1682991

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16198SLG026	Sample number(s): 8475486-8475499 UNSPK: 8475499									
Anthracene	3058.33	1654.53	4407.64	1649.62	4121.84	82	64*	82-118	7	30
Benzo(a)anthracene	3973.68	1654.53	5427.72	1649.62	4956.04	88	60*	76-119	9	30
Benzo(a)pyrene	3074.05	1654.53	4986.76	1649.62	4043.18	116	59*	85-117	21	30
Benzo(b)fluoranthene	5442.64	1654.53	6390.31	1649.62	4450.14	57*	-59*	78-129	36*	30
Benzo(g,h,i)perylene	2348.96	1654.53	4433.97	1649.62	3652.41	126*	79	77-118	19	30
Chrysene	3921.89	1654.53	5481.06	1649.62	4978.41	94	64*	80-121	10	30
Fluorene	5928.6	1654.53	7019.7	1649.62	6566.1	66*	39*	86-118	7	30
Naphthalene	2722.49	1654.53	4432.06	1649.62	3962.32	103	75*	82-112	11	30
Phenanthrene	15686.79	1654.53	15721.89	1649.62	13762.77	2 (2)	-116 (2)	80-114	13	30
Pyrene	4453.11	1654.53	5494.45	1649.62	4970.11	63*	31*	81-114	10	30

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc %	DUP Conc %	DUP RPD	DUP RPD Max
Batch number: 16201820004B	Sample number(s): 8475486-8475499 BKG: 8475498			
Moisture	40.19	39.75	1	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: TCL 8270 (microwave)
Batch number: 16198SLG026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8475486	125*	91	93
8475487	124*	96	103
8475488	168*	101	106
8475489	89	88	90
8475490	115	105	103
8475491	127*	96	102
8475492	95	99	105
8475493	89	93	97
8475494	91	95	95
8475495	89	96	92
8475496	90	89	93
8475497	93	97	99
8475498	101	97	94

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 08/02/2016 12:34

Group Number: 1682991

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8475499	147*	87	96
Blank	89	88	96
LCS	91	89	97
MS	122	94	95
MSD	120	99	102
Limits:	54-123	63-117	59-129

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1682991 Sample # 8475486-99

1 of 2

COC # 504850

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen 11109626/11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix: Tissue ☐ Sediment ☐ Soil ☑ Water: Ground ☐ Potable ☐ Surface ☐ NPDES ☐ Other: ____

Analysis Requested: Select SVOCs

Preservation Codes

For Lab Use Only

FSC:

SCR#: 190918

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	Remarks
~~AOI6-BH-16-0-2-071116~~			1	1	1	AC
~~AOI6-BH-16-2-4-071116~~			1	1	1	AC
AOI6-BH-16-016-0-2-071116	07/11/16	1556	1	1	1	
AOI6-BH-16-016-2-4-071116		1615	1	1	1	
AOI6-BH-16-015-0-2-071116		1652	1	1	1	
AOI6-BH-16-015-2-4-071116		1703	1	1	1	
AOI6-BH-16-014-0-2-071116		1735	1	1	1	
AOI6-BH-16-014-2-4-071116		1745	1	1	1	
AOI6-B-172-0-2-071216	07/12/16	1535	1	1	1	
AOI6-B-172-2-4-071216		1535	1	1	1	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Bottle storage	6.29.16	815	[signature]	6.29.16	815
[signature]	6.29.16				
[signature]	7/13/16	1400	[signature]	7.14.16	1010
[signature]	7.14.16	1525			
			[signature]	7/14/16	1525

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.4 °C

Environmental Analysis Request/Chain of Custody

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Acct. # 10177 Group # 1682991 Sample # 8475486-99

2 of 2 COC # 504851

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen 11109626 / 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alisa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: ____

Analysis Requested

Preservation Codes

Select SVOC

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Total # of Containers	Select SVOC
AOI6-B-173-0-2-071216	07/12/16	1705	1		1	1	1
AOI6-B-173-2-4-071316	07/13/16	1106	1		1	1	1
AOI6-B-174-0-2-071316		1200	1		1	1	1
AOI6-B-174-2-4-071316		1240	1		1	1	1
AOI6-B-175-0-2-071316		1310	1		1	1	1
AOI6-B-175-2-4-071316		1320	1		1	1	1

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	7/13/16	1700	[signature]	7/14/16	10:10
[signature]	7.14.16	1525			
			[signature]	7/14/16	1526

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.4 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 153830

Group Number(s): 1682991

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	07/14/2016 15:25
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	No	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Karen Diem (3060) at 16:24 on 07/14/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.4	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: September 08, 2016

Project: Philadelphia Refinery

Submittal Date: 08/24/2016
Group Number: 1699628
SDG: MHF70
PO Number: 11109626
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
GW-11109613-B-169-082216-KC-001 Grab Groundwater	8548677
GW-11109613-B-158-082216-AC-002 Grab Groundwater	8548678
GW-11109613-B-170-082216-KC-003 Grab Groundwater	8548679
GW-11109613-U-4-082216-AC-004 Grab Groundwater	8548680
GW-11109613-B-43-082216-KC-005 Grab Groundwater	8548681
GW-11109613-B-117-082216-AC-006 Grab Groundwater	8548682
GW-11109613-B-174-082216-KC-007 Grab Groundwater	8548683
TB-11109613-082216-AC-01 Water	8548684
GW-11109613-B-126-082316-KC-008 Grab Groundwater	8548685
GW-11109613-B-172-082316-AC-009 Grab Groundwater	8548686
GW-11109613-B-125-082316-KC-010 Grab Groundwater	8548687
GW-11109613-B-172D-082316-AC-011 Grab Groundwater	8548688
GW-11109613-B-173-082316-KC-012 Grab Groundwater	8548689
GW-11109613-URS-1-082316-AC-013 Grab Groundwater	8548690
GW-11109613-B-164-082316-KC-014 Grab Groundwater	8548691
GW-11109613-B-175-082316-AC-015 Grab Groundwater	8548692
TB-11109613-082316-AC-02 Water	8548693

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: GW-11109613-B-169-082216-KC-001 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548677
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 09:24 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7001 SDG#: MHF70-01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	N.D.	0.057	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.013 J	0.057	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.015 J	0.057	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.020 J	0.057	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.016 J	0.057	0.011	1
08357	Chrysene	218-01-9	0.017 J	0.057	0.011	1
08357	Fluorene	86-73-7	N.D.	0.057	0.011	1
08357	Naphthalene	91-20-3	N.D.	0.069	0.034	1
08357	Phenanthrene	85-01-8	N.D.	0.069	0.034	1
08357	Pyrene	129-00-0	0.035 J	0.057	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Naphthalene and Anthracene were also detected in the re-extracted sample.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Naphthalene and Anthracene were also detected in the re-extracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0065	0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-169-082216-KC-001 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548677
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 09:24 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7001 SDG#: MHF70-01

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/28/2016 19:56	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/28/2016 19:56	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 13:37	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 03:09	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:29	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-158-082216-AC-002 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548678
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 10:25 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7002 SDG#: MHF70-02

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.037 J	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.055	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.042 J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.046 J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.027 J	0.051	0.010	1
08357	Chrysene	218-01-9	0.045 J	0.051	0.010	1
08357	Fluorene	86-73-7	0.094	0.051	0.010	1
08357	Naphthalene	91-20-3	0.078	0.061	0.030	1
08357	Phenanthrene	85-01-8	0.043 J	0.061	0.030	1
08357	Pyrene	129-00-0	0.31	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00089 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-158-082216-AC-002 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548678
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 10:25 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7002 SDG#: MHF70-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/28/2016 23:33	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/28/2016 23:33	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 14:04	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 03:41	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:40	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-170-082216-KC-003 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548679
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 11:40 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7003 SDG#: MHF70-03

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	3		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	5		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	0.7	J	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.26		0.057	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.065		0.057	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.043	J	0.057	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.044	J	0.057	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.020	J	0.057	0.011	1
08357	Chrysene	218-01-9	0.069		0.057	0.011	1
08357	Fluorene	86-73-7	0.61		0.057	0.011	1
08357	Naphthalene	91-20-3	N.D.		0.068	0.034	1
08357	Phenanthrene	85-01-8	0.99		0.068	0.034	1
08357	Pyrene	129-00-0	0.31		0.057	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-170-082216-KC-003 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548679
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 11:40 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7003 SDG#: MHF70-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/28/2016 23:57	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/28/2016 23:57	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 14:32	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 03:56	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:41	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-U-4-082216-AC-004 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8548680
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 14:35 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7004 SDG#: MHF70-04

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.32 J	0.50	0.10	10
08357	Benzo(a)anthracene	56-55-3	0.99	0.50	0.10	10
08357	Benzo(a)pyrene	50-32-8	2.7	0.50	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	1.1	0.50	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	2.4	0.50	0.10	10
08357	Chrysene	218-01-9	4.5	0.50	0.10	10
08357	Fluorene	86-73-7	0.22 J	0.50	0.10	10
08357	Naphthalene	91-20-3	9.3	0.60	0.30	10
08357	Phenanthrene	85-01-8	N.D.	0.60	0.30	10
08357	Pyrene	129-00-0	2.9	0.50	0.10	10

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0094	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00078 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-U-4-082216-AC-004 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548680
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 14:35 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7004 SDG#: MHF70-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 00:21	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 00:21	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 15:00	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 04:12	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:51	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-43-082216-KC-005 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548681
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 12:35 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7005 SDG#: MHF70-05

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	6		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	0.6	J	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.22		0.053	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.89		0.053	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.66		0.053	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.75		0.053	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.32		0.053	0.011	1
08357	Chrysene	218-01-9	1.0		0.053	0.011	1
08357	Fluorene	86-73-7	0.34		0.053	0.011	1
08357	Naphthalene	91-20-3	N.D.		0.063	0.032	1
08357	Phenanthrene	85-01-8	0.24		0.063	0.032	1
08357	Pyrene	129-00-0	2.9		0.053	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Phenanthrene was not detected in the re-extracted sample.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. However, the surrogate recoveries were outside the QC limits in the re-extracted sample due to unresolvable matrix problems evident in the sample chromatogram. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Phenanthrene was not detected in the re-extracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0028		0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-43-082216-KC-005 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548681
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 12:35 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7005 SDG#: MHF70-05

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 00:45	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 00:45	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 15:55	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 04:28	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:52	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-117-082216-AC-006 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548682
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 15:26 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7006 SDG#: MHF70-06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.0	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.25	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.19	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.23	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.13	0.051	0.010	1
08357	Chrysene	218-01-9	0.34	0.051	0.010	1
08357	Fluorene	86-73-7	0.24	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.030	1
08357	Phenanthrene	85-01-8	1.1	0.061	0.030	1
08357	Pyrene	129-00-0	2.4	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Phenanthrene was not detected in the re-extracted sample.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Phenanthrene was not detected in the re-extracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0094	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00025 J	0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-117-082216-AC-006 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8548682
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 15:26 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7006 SDG#: MHF70-06

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 01:09	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 01:09	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 16:23	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 04:44	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:47	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-174-082216-KC-007 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548683
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 14:28 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

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2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7007 SDG#: MHF70-07

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	7	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.095	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.080	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.060	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.065	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.034 J	0.051	0.010	1
08357	Chrysene	218-01-9	0.081	0.051	0.010	1
08357	Fluorene	86-73-7	0.27	0.051	0.010	1
08357	Naphthalene	91-20-3	0.083	0.061	0.030	1
08357	Phenanthrene	85-01-8	0.48	0.061	0.030	1
08357	Pyrene	129-00-0	0.33	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0019	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-174-082216-KC-007 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548683
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 14:28 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7007 SDG#: MHF70-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 01:33	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 01:33	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 16:51	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 05:00	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:54	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-082216-AC-01 Water
Philadelphia Refinery

LL Sample # WW 8548684
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/22/2016 16:00

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7008 SDG#: MHF70-08TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/28/2016 19:32	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/28/2016 19:32	Hu Yang	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 05:16	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-126-082316-KC-008 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548685
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 08:46 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7009 SDG#: MHF70-09

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	78		5	3	5
10945	1,2-Dichloroethane	107-06-2	N.D.		5	3	5
10945	Ethylbenzene	100-41-4	9		5	3	5
10945	Isopropylbenzene	98-82-8	40		10	3	5
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5	3	5
10945	Toluene	108-88-3	29		5	3	5
10945	1,2,4-Trimethylbenzene	95-63-6	5	J	10	3	5
10945	1,3,5-Trimethylbenzene	108-67-8	4	J	10	3	5
10945	Xylene (Total)	1330-20-7	47		5	3	5
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	6.6		0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.82		0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.39		0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.39		0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.14		0.052	0.010	1
08357	Chrysene	218-01-9	0.67		0.052	0.010	1
08357	Fluorene	86-73-7	39		0.52	0.10	10
08357	Naphthalene	91-20-3	5.4		0.062	0.031	1
08357	Phenanthrene	85-01-8	5.1		0.062	0.031	1
08357	Pyrene	129-00-0	5.7		0.052	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Results were not comparable and sufficient sample was not available to repeat the analysis.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Results were not comparable and sufficient sample was not available to repeat the analysis.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-126-082316-KC-008 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548685
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 08:46 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7009 SDG#: MHF70-09

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 03:10	Hu Yang	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 03:10	Hu Yang	5
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 17:19	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 14:50	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 05:32	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:56	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-172-082316-AC-009 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548686
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 08:45 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7010 SDG#: MHF70-10

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	160	5	3	5
10945	1,2-Dichloroethane	107-06-2	N.D.	5	3	5
10945	Ethylbenzene	100-41-4	N.D.	5	3	5
10945	Isopropylbenzene	98-82-8	N.D.	10	3	5
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	3	5
10945	Toluene	108-88-3	N.D.	5	3	5
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	10	3	5
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	10	3	5
10945	Xylene (Total)	1330-20-7	N.D.	5	3	5
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.33	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.27	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.18	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.18	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.085	0.051	0.010	1
08357	Chrysene	218-01-9	0.25	0.051	0.010	1
08357	Fluorene	86-73-7	0.56	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.031	1
08357	Phenanthrene	85-01-8	0.26	0.061	0.031	1
08357	Pyrene	129-00-0	1.0	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00030 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-172-082316-AC-009 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548686
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 08:45 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7010 SDG#: MHF70-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 03:34	Hu Yang	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 03:34	Hu Yang	5
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/29/2016 17:47	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 06:19	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:58	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-125-082316-KC-010 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548687
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 09:17 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7011 SDG#: MHF70-11

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	9		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	9		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	4		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	0.8	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	2		2	0.5	1
10945	Xylene (Total)	1330-20-7	25		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.9		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.16		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.040	J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.046	J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.012	J	0.051	0.010	1
08357	Chrysene	218-01-9	0.13		0.051	0.010	1
08357	Fluorene	86-73-7	6.6		0.051	0.010	1
08357	Naphthalene	91-20-3	0.31		0.061	0.031	1
08357	Phenanthrene	85-01-8	3.3		0.061	0.031	1
08357	Pyrene	129-00-0	1.4		0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Benzo(g,h,i)perylene was not detected in the re-extracted sample.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.
Benzo(g,h,i)perylene was not detected in the re-extracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-125-082316-KC-010 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548687
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 09:17 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7011 SDG#: MHF70-11

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 01:57	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 01:57	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 11:58	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 06:51	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 09:00	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-172D-082316-AC-011 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548688
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 08:55 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7012 SDG#: MHF70-12

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	160	5	3	5
10945	1,2-Dichloroethane	107-06-2	N.D.	5	3	5
10945	Ethylbenzene	100-41-4	N.D.	5	3	5
10945	Isopropylbenzene	98-82-8	N.D.	10	3	5
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	5	3	5
10945	Toluene	108-88-3	N.D.	5	3	5
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	10	3	5
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	10	3	5
10945	Xylene (Total)	1330-20-7	N.D.	5	3	5
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.10	0.053	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.13	0.053	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.092	0.053	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.094	0.053	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.041 J	0.053	0.011	1
08357	Chrysene	218-01-9	0.15	0.053	0.011	1
08357	Fluorene	86-73-7	0.23	0.053	0.011	1
08357	Naphthalene	91-20-3	N.D.	0.064	0.032	1
08357	Phenanthrene	85-01-8	0.036 J	0.064	0.032	1
08357	Pyrene	129-00-0	0.86	0.053	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Naphthalene was not detected in the re-ectracted sample.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Naphthalene was not detected in the re-ectracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00025 J	0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-172D-082316-AC-011 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548688
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 08:55 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7012 SDG#: MHF70-12

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	Z162412AA	08/29/2016 03:58	Hu Yang	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z162412AA	08/29/2016 03:58	Hu Yang	5
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 12:27	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 07:07	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 09:02	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-173-082316-KC-012 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548689
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 11:29 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7013 SDG#: MHF70-13

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	17	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	4	1	0.5	1
10945	Isopropylbenzene	98-82-8	33	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	5	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	5	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	14	2	0.5	1
10945	Xylene (Total)	1330-20-7	8	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	6.1	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	1.2	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.51	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.55	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.12	0.051	0.010	1
08357	Chrysene	218-01-9	0.90	0.051	0.010	1
08357	Fluorene	86-73-7	18	0.51	0.10	10
08357	Naphthalene	91-20-3	12	0.61	0.30	10
08357	Phenanthrene	85-01-8	22	0.61	0.30	10
08357	Pyrene	129-00-0	4.8	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0014	0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-173-082316-KC-012 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548689
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 11:29 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7013 SDG#: MHF70-13

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162431AA	08/30/2016 10:47	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162431AA	08/30/2016 10:47	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 12:57	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 17:22	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 07:23	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 08:49	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-URS-1-082316-AC-013 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548690
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 12:05 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7014 SDG#: MHF70-14

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.62	0.053	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.017 J	0.053	0.011	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.053	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.053	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.053	0.011	1
08357	Chrysene	218-01-9	0.012 J	0.053	0.011	1
08357	Fluorene	86-73-7	16	0.26	0.053	5
08357	Naphthalene	91-20-3	4.4	0.064	0.032	1
08357	Phenanthrene	85-01-8	0.98	0.064	0.032	1
08357	Pyrene	129-00-0	0.32	0.053	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00022 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-1-082316-AC-013 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548690
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 12:05 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7014 SDG#: MHF70-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162431AA	08/30/2016 10:25	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162431AA	08/30/2016 10:25	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 13:26	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 17:50	Catherine E Bachman	5
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 07:39	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 09:03	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-164-082316-KC-014 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548691
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 12:03 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7015 SDG#: MHF70-15

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	1		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	5		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	N.D.		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.057		0.053	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.017	J	0.053	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.019	J	0.053	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.021	J	0.053	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.018	J	0.053	0.011	1
08357	Chrysene	218-01-9	0.013	J	0.053	0.011	1
08357	Fluorene	86-73-7	0.069		0.053	0.011	1
08357	Naphthalene	91-20-3	0.037	J	0.063	0.032	1
08357	Phenanthrene	85-01-8	0.045	J	0.063	0.032	1
08357	Pyrene	129-00-0	0.047	J	0.053	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Phenanthrene was not detected in the re-extracted sample.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Phenanthrene was not detected in the re-extracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.029	0.0095	1
Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0019		0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-164-082316-KC-014 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548691
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 12:03 by KC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7015 SDG#: MHF70-15

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162422AA	08/29/2016 19:50	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162422AA	08/29/2016 19:50	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 13:55	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 07:54	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 09:09	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-175-082316-AC-015 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548692
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 15:20 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7016 SDG#: MHF70-16

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	65		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	5		1	0.5	1
10945	Isopropylbenzene	98-82-8	63		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	15		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	2	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	10		2	0.5	1
10945	Xylene (Total)	1330-20-7	11		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.78		0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.36		0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.22		0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.27		0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.096		0.052	0.010	1
08357	Chrysene	218-01-9	0.33		0.052	0.010	1
08357	Fluorene	86-73-7	3.2		0.052	0.010	1
08357	Naphthalene	91-20-3	N.D.		0.062	0.031	1
08357	Phenanthrene	85-01-8	3.5		0.062	0.031	1
08357	Pyrene	129-00-0	0.93		0.052	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0094	1

The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.

Metals Dissolved	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0031		0.0010	0.000090	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-175-082316-AC-015 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8548692
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 15:20 by AC

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7016 SDG#: MHF70-16

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162431AA	08/30/2016 11:08	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162431AA	08/30/2016 11:08	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16239WAD026	08/30/2016 14:23	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16239WAD026	08/26/2016 16:45	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 08:10	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1
06035	Lead	SW-846 6020	1	162476050006A	09/06/2016 09:11	Choon Y Tian	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162476050006	09/04/2016 21:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-082316-AC-02 Water
Philadelphia Refinery

LL Sample # WW 8548693
LL Group # 1699628
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/23/2016 16:00

Submitted: 08/24/2016 15:53
Reported: 09/08/2016 11:15

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

M7017 SDG#: MHF70-17TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0094	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162422AA	08/29/2016 20:33	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162422AA	08/29/2016 20:33	Daniel H Heller	1
10398	EDB in Wastewater	SW-846 8011	1	162440031A	09/02/2016 08:26	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162440031A	09/01/2016 11:00	David S Schrum	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ug/l	LOQ** ug/l	MDL ug/l
Batch number: F162422AA	Sample number(s): 8548691,8548693		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: F162431AA	Sample number(s): 8548689-8548690,8548692		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: Z162412AA	Sample number(s): 8548677-8548688		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: 16239WAD026	Sample number(s): 8548677-8548683,8548685-8548692		
Anthracene	N.D.	0.050	0.010
Benzo(a)anthracene	N.D.	0.050	0.010
Benzo(a)pyrene	N.D.	0.050	0.010
Benzo(b)fluoranthene	N.D.	0.050	0.010
Benzo(g,h,i)perylene	N.D.	0.050	0.010
Chrysene	N.D.	0.050	0.010
Fluorene	N.D.	0.050	0.010
Naphthalene	N.D.	0.060	0.030
Phenanthrene	N.D.	0.060	0.030
Pyrene	N.D.	0.050	0.010
Batch number: 162440031A	Sample number(s): 8548677-8548693		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Ethylene dibromide	N.D.	0.030	0.010
	mg/l	mg/l	mg/l
Batch number: 162476050006A	Sample number(s): 8548677-8548683,8548685-8548692		
Lead	N.D.	0.0010	0.000090

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: F162422AA	Sample number(s): 8548691,8548693								
Benzene	20	19.49	20	18.62	97	93	78-120	5	30
1,2-Dichloroethane	20	18.38	20	18.23	92	91	66-128	1	30
Ethylbenzene	20	18.74	20	18.31	94	92	78-120	2	30
Isopropylbenzene	20	19.29	20	18.97	96	95	80-120	2	30
Methyl Tertiary Butyl Ether	20	18.41	20	17.87	92	89	75-120	3	30
Toluene	20	18.7	20	17.97	93	90	80-120	4	30
1,2,4-Trimethylbenzene	20	18.01	20	17.42	90	87	75-120	3	30
1,3,5-Trimethylbenzene	20	17.98	20	17.54	90	88	75-120	2	30
Xylene (Total)	60	56.7	60	55.13	95	92	80-120	3	30
Batch number: F162431AA	Sample number(s): 8548689-8548690,8548692								
Benzene	20	17.8			89		78-120		
1,2-Dichloroethane	20	17.65			88		66-128		
Ethylbenzene	20	17.65			88		78-120		
Isopropylbenzene	20	17.99			90		80-120		
Methyl Tertiary Butyl Ether	20	16.69			83		75-120		
Toluene	20	17.83			89		80-120		
1,2,4-Trimethylbenzene	20	18.57			93		75-120		
1,3,5-Trimethylbenzene	20	18.86			94		75-120		
Xylene (Total)	60	53.78			90		80-120		
Batch number: Z162412AA	Sample number(s): 8548677-8548688								
Benzene	20	19.57			98		78-120		
1,2-Dichloroethane	20	21.9			110		66-128		
Ethylbenzene	20	19.39			97		78-120		
Isopropylbenzene	20	19.51			98		80-120		
Methyl Tertiary Butyl Ether	20	20.71			104		75-120		
Toluene	20	19.73			99		80-120		
1,2,4-Trimethylbenzene	20	19.14			96		75-120		
1,3,5-Trimethylbenzene	20	18.43			92		75-120		
Xylene (Total)	60	59.39			99		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16239WAD026	Sample number(s): 8548677-8548683,8548685-8548692								
Anthracene	1.00	0.778			78		68-109		
Benzo(a)anthracene	1.00	0.691			69		66-111		

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(a)pyrene	1.00	0.640			64*		66-111		
Benzo(b)fluoranthene	1.00	0.683			68*		69-117		
Benzo(g,h,i)perylene	1.00	0.452			45*		56-115		
Chrysene	1.00	0.661			66		66-105		
Fluorene	1.00	0.817			82		66-110		
Naphthalene	1.00	0.722			72		61-112		
Phenanthrene	1.00	0.800			80		70-107		
Pyrene	1.00	0.754			75		60-108		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 162440031A	Sample number(s): 8548677-8548693								
Ethylene dibromide	0.128	0.115	0.128	0.120	90	94	60-140	4	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 162476050006A	Sample number(s): 8548677-8548683,8548685-8548692								
Lead	0.0150	0.0156			104		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: F162422AA	Sample number(s): 8548691,8548693 UNSPK: P547901									
Benzene	9.12	20	28.76	20	28.53	98	97	78-120	1	30
1,2-Dichloroethane	1.55	20	20.2	20	20.72	93	96	66-128	3	30
Ethylbenzene	24.58	20	44.14	20	44.3	98	99	78-120	0	30
Isopropylbenzene	36.47	20	57.46	20	56.83	105	102	80-120	1	30
Methyl Tertiary Butyl Ether	N.D.	20	17.66	20	17.84	88	89	75-120	1	30
Toluene	4.05	20	22.87	20	22.96	94	95	80-120	0	30
1,2,4-Trimethylbenzene	6.46	20	25.37	20	25.27	95	94	75-120	0	30
1,3,5-Trimethylbenzene	10.92	20	29.91	20	30.09	95	96	75-120	1	30
Xylene (Total)	34.15	60	93.63	60	93.56	99	99	80-120	0	30
Batch number: F162431AA	Sample number(s): 8548689-8548690,8548692 UNSPK: P552537									
Benzene	N.D.	20	19.21	20	18.36	96	92	78-120	5	30
1,2-Dichloroethane	N.D.	20	18.13	20	17.51	91	88	66-128	3	30
Ethylbenzene	N.D.	20	18.82	20	17.86	94	89	78-120	5	30
Isopropylbenzene	N.D.	20	19.44	20	18.36	97	92	80-120	6	30
Methyl Tertiary Butyl Ether	N.D.	20	16.88	20	16.15	84	81	75-120	4	30
Toluene	N.D.	20	19.09	20	18.24	95	91	80-120	5	30
1,2,4-Trimethylbenzene	N.D.	20	17.81	20	16.82	89	84	75-120	6	30
1,3,5-Trimethylbenzene	N.D.	20	19.47	20	18.6	97	93	75-120	5	30
Xylene (Total)	N.D.	60	56.09	60	53.33	93	89	80-120	5	30
Batch number: Z162412AA	Sample number(s): 8548677-8548688 UNSPK: 8548677									

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Benzene	N.D.	20	20.77	20	21.56	104	108	78-120	4	30
1,2-Dichloroethane	N.D.	20	21.74	20	22.85	109	114	66-128	5	30
Ethylbenzene	N.D.	20	20.79	20	21.17	104	106	78-120	2	30
Isopropylbenzene	N.D.	20	20.89	20	21.59	104	108	80-120	3	30
Methyl Tertiary Butyl Ether	N.D.	20	19.69	20	20.65	98	103	75-120	5	30
Toluene	N.D.	20	21.17	20	21.59	106	108	80-120	2	30
1,2,4-Trimethylbenzene	N.D.	20	20.25	20	20.27	101	101	75-120	0	30
1,3,5-Trimethylbenzene	N.D.	20	19.92	20	20.01	100	100	75-120	0	30
Xylene (Total)	N.D.	60	63.46	60	63.85	106	106	80-120	1	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 16239WAD026	Sample number(s): 8548677-8548683,8548685-8548692 UNSPK: P546410									
Anthracene	N.D.	1.02	0.754	1.01	0.800	74	79	68-109	6	30
Benzo(a)anthracene	N.D.	1.02	0.847	1.01	0.841	83	83	66-111	1	30
Benzo(a)pyrene	N.D.	1.02	0.748	1.01	0.770	74	76	66-111	3	30
Benzo(b)fluoranthene	N.D.	1.02	0.772	1.01	0.788	76	78	69-117	2	30
Benzo(g,h,i)perylene	N.D.	1.02	0.717	1.01	0.748	71	74	56-115	4	30
Chrysene	N.D.	1.02	0.826	1.01	0.834	81	82	66-105	1	30
Fluorene	0.171	1.02	1.08	1.01	1.10	90	92	66-110	1	30
Naphthalene	N.D.	1.02	0.917	1.01	0.889	90	88	61-112	3	30
Phenanthrene	0.0803	1.02	0.966	1.01	0.940	87	85	70-107	3	30
Pyrene	0.0205	1.02	0.808	1.01	0.834	77	80	60-108	3	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 162440031A	Sample number(s): 8548677-8548693 UNSPK: 8548677									
Ethylene dibromide	N.D.	0.122	0.0917			75		60-140		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 162476050006A	Sample number(s): 8548677-8548683,8548685-8548692 UNSPK: 8548677									
Lead	0.00655	0.0150	0.0223	0.0150	0.0221	105	104	75-125	1	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 162440031A	Sample number(s): 8548677-8548693 BKG: 8548686			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	mg/l	mg/l		
Batch number: 162476050006A	Sample number(s): 8548677-8548683,8548685-8548692 BKG: 8548677			
Lead	0.00655	0.00649	1	20

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: F162422AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8548691	97	93	99	100
8548693	100	102	98	99
Blank	101	99	97	96
LCS	100	100	100	100
LCSD	100	100	101	100
MS	99	100	99	107
MSD	101	102	99	106
Limits:	80-116	77-113	80-113	78-113

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: F162431AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8548689	98	97	99	108
8548690	100	98	100	97
8548692	98	97	100	101
Blank	99	98	101	96
LCS	98	98	100	98
MS	99	97	101	101
MSD	98	101	100	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: Z162412AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8548677	99	101	99	97
8548678	98	100	99	97
8548679	98	101	99	108
8548680	99	101	99	96
8548681	98	100	99	103
8548682	98	99	100	99
8548683	100	102	100	97
8548684	99	101	99	96
8548685	96	99	105	98
8548686	96	98	100	98
8548687	96	99	100	101
8548688	97	98	100	97
Blank	99	100	97	97
LCS	97	101	100	101
MS	98	99	100	99
MSD	97	102	100	101
Limits:	80-116	77-113	80-113	78-113

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAHs in waters by SIM
Batch number: 16239WAD026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8548677	56	59	58
8548678	86	80	81
8548679	98	87	98
8548680	114	89	89
8548681	106	81	88
8548682	127	79	84
8548683	63	75	81
8548685	78	75	74
8548686	70	82	81
8548687	112	81	77
8548688	76	82	81
8548689	137*	64	86
8548690	71	80	78
8548691	64	61	81
8548692	73	34	68
Blank	50*	50	43*
LCS	81	64	71
MS	72	78	82
MSD	74	82	80
Limits:	51-128	34-130	45-119

Analysis Name: EDB in Wastewater
Batch number: 162440031A

	1,1,2,2-Tetrachloroethane
8548677	85
8548678	82
8548679	91
8548680	105
8548681	90
8548682	87
8548683	95
8548684	92
8548685	93
8548686	86
8548687	89
8548688	92
8548689	85
8548690	91
8548691	92
8548692	898*
8548693	99
Blank	86
DUP	83
LCS	84
LCSD	78
MS	80

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/08/2016 11:15

Group Number: 1699628

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Limits: 46-136

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1699628 Sample # 8548677-93

1 of 2

COC # 507704

Client Information

Client: Evergreen / 6HD

Acct. #:

Project Name/#: Evergreen PES 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon / K Curry

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#: 193095

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	Water	NPDES	Surface	Other:	Total # of Containers	Lead (Total) Filtered	EDB in Wastewater	BTEX/MTBE/Cumene/EDC/TMB	PAHs in water by SIM	Metals QC							Remarks
6W-11109613-B-169-082216-KC-001	08/22/16	0924	8							8				8	1	2	3	2								Philadelphia Database
6W-11109613-B-158-082216-AC-002		1025	8							8				8	1	2	3	2								
6W-11109613-B-170-082216-KC-003		1140	8							8				8	1	2	3	2								
6W-11109613-U-4-082216-AC-004		1435	8							8				8	1	2	3	2								
6W-11109613-B-43-082216-KC-005		1235	8							8				8	1	2	3	2								
6W-11109613-B-117-082216-AC-006		1526	8							8				8	1	2	3	2								
6W-11109613-B-174-082216-KC-007		1428	8							8				8	1	2	3	2								
TB-11109613-082216-AC-01		1600											4	4		2	2	N/A								Trip Blanks
6W-11109613-B-126-082316-KC-008	08/23/16	0846	~~8~~ 9							~~8~~ 9				~~8~~ 9	1	2	3	2	1							
6W-11109613-B-172-082316-AC-009		0845	8							8				8	1	2	3	2								

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	8.17.16	820	[signature]	8.17.16	820
[signature]	8.17.16				
[signature]	8/23/16	1700	[signature]	8.23.16	1300
[signature]	8.24.16	1553			
			[signature]	8.24.16	1553

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.2-1.7 °C

Environmental Analysis Request/Chain of Custody

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Acct. # 10177 Group # 1699628 Sample # 8548677-93

2 of 2

COC # 507703

Client Information

Client: Evergreen / GHD	Acct. #:
Project Name/#: Evergreen PES / 11109613	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: A. Cannon / K. Corry	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC: ____
SCR#: ____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks: Philadelphia Database

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Lead (Field Filtered)	EDB in wastewater	BTEX/MTBE/Cumene/EDC/TMB	PAHs in waters by SIM	Metals QC						
GW-11109613-B-125-082316-KC-010	08/23/16	0917	8			8		8	1	2	3	2							
GW-11109613-B-172D-082316-AC-011		0855	8			8		8	1	2	3	2							
~~GW-11109613-B-173-082316-KC-012~~	AC	1129																	
GW-11109613-B-173-082316-KC-012		1129	8			8		8	1	2	3	2							
GW-11109613-URS-1-082316-AC-013		1205	9			9		9	1	2	3	2	1						
GW-11109613-B-164-082316-KC-014		1203	8			8		8	1	2	3	2							
GW-11109613-B-175-082316-AC-015		1520	8			8		8	1	2	3	2							
TB-11109613-082316-AC-02		1600	4				4	4		2	2								

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	8/23/16	1700	[signature]	8-24-16	13:08
[signature]	8.24.16	1553			
			[signature]	8-24-16	1553

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)
Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13
NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.2-1.7 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 160079

Group Number(s): 1699628

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	08/24/2016 15:53
Number of Packages:	2	Number of Projects:	2
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	No	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	No
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	8
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Cory Jeremiah (10469) at 17:30 on 08/24/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.2	DT	Wet	Y	Bagged	N
2	DT146	1.4	DT	Wet	Y	Bagged	N
3	DT146	1.7	DT	Wet	Y	Bagged	N

Sample Date/Time Discrepancy Details

Sample ID on COC	Date/Time on Label	Comments
GW-11109613-B-169-0822 16-KC-001	8/22/2016 09:34	

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: September 07, 2016

Project: Philadelphia Refinery

Submittal Date: 08/26/2016
Group Number: 1700638
SDG: MHF71
PO Number: 11109626
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-AA16-001 Air	8553153
AOI6-AA16-002 Air	8553154
AOI6-AA16-003 Air	8553155

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-AA16-001 Air
SUMMA# 1023
Philadelphia Refinery

LL Sample # AQ 8553153
LL Group # 1700638
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 07:14 by AC
through 08/25/2016 16:21
Submitted: 08/26/2016 19:15
Reported: 09/07/2016 15:09

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7101 SDG#: MHF71-01

CAT No.	Analysis Name	CAS Number	Final Result	LOQ	Final Result	LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)	ppb(v)	ug/m3	ug/m3	
05298	Benzene	71-43-2	N.D.	1.0	N.D.	3.2	1
05298	Cumene	98-82-8	N.D.	1.0	N.D.	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.	1.0	N.D.	7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.	1.0	N.D.	4.0	1
05298	Ethylbenzene	100-41-4	N.D.	1.0	N.D.	4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	1.0	N.D.	3.6	1
05298	Naphthalene	91-20-3	N.D.	1.0	N.D.	5.2	1
05298	Toluene	108-88-3	N.D.	1.0	N.D.	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.	1.0	N.D.	4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.	1.0	N.D.	4.9	1
05298	m/p-Xylene	n.a.	N.D.	1.0	N.D.	4.3	1
05298	o-Xylene	95-47-6	N.D.	1.0	N.D.	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1624630AA	09/03/2016 01:32	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AA16-002 Air
SUMMA# 1118
Philadelphia Refinery

LL Sample # AQ 8553154
LL Group # 1700638
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 07:33 by AC
through 08/25/2016 16:32
Submitted: 08/26/2016 19:15
Reported: 09/07/2016 15:09

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7102 SDG#: MHF71-02

CAT No.	Analysis Name	CAS Number	Final Result	LOQ	Final Result	LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)	ppb(v)	ug/m3	ug/m3	
05298	Benzene	71-43-2	N.D.	1.0	N.D.	3.2	1
05298	Cumene	98-82-8	N.D.	1.0	N.D.	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.	1.0	N.D.	7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.	1.0	N.D.	4.0	1
05298	Ethylbenzene	100-41-4	N.D.	1.0	N.D.	4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	1.0	N.D.	3.6	1
05298	Naphthalene	91-20-3	N.D.	1.0	N.D.	5.2	1
05298	Toluene	108-88-3	N.D.	1.0	N.D.	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.	1.0	N.D.	4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.	1.0	N.D.	4.9	1
05298	m/p-Xylene	n.a.	N.D.	1.0	N.D.	4.3	1
05298	o-Xylene	95-47-6	N.D.	1.0	N.D.	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1624630AA	09/03/2016 02:04	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AA16-003 Air
SUMMA# 1202
Philadelphia Refinery

LL Sample # AQ 8553155
LL Group # 1700638
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 07:47 by AC
through 08/25/2016 16:41
Submitted: 08/26/2016 19:15
Reported: 09/07/2016 15:09

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7103 SDG#: MHF71-03

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	N.D.		1.0	N.D.		3.2	1
05298	Cumene	98-82-8	N.D.		1.0	N.D.		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	N.D.		1.0	N.D.		3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.34	J	1.0	1.5	J	4.3	1
05298	o-Xylene	95-47-6	0.25	J	1.0	1.1	J	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1624630AA	09/03/2016 02:36	Jacob E Bailey	1

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/07/2016 15:09

Group Number: 1700638

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppb(v)	LOQ ppb(v)	Result ug/m3	LOQ ug/m3
Batch number: E1624630AA	Sample number(s): 8553153-8553155			
Benzene	N.D.	1.0	N.D.	3.2
Cumene	N.D.	1.0	N.D.	4.9
1,2-Dibromoethane	N.D.	1.0	N.D.	7.7
1,2-Dichloroethane	N.D.	1.0	N.D.	4.0
Ethylbenzene	N.D.	1.0	N.D.	4.3
Methyl t-Butyl Ether	N.D.	1.0	N.D.	3.6
Naphthalene	N.D.	1.0	N.D.	5.2
Toluene	N.D.	1.0	N.D.	3.8
1,2,4-Trimethylbenzene	N.D.	1.0	N.D.	4.9
1,3,5-Trimethylbenzene	N.D.	1.0	N.D.	4.9
m/p-Xylene	N.D.	1.0	N.D.	4.3
o-Xylene	N.D.	1.0	N.D.	4.3

LCS/LCSD

Analysis Name	LCS Spike Added ppb(v)	LCS Conc ppb(v)	LCSD Spike Added ppb(v)	LCSD Conc ppb(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: E1624630AA	Sample number(s): 8553153-8553155								
Benzene	10	9.99	10	9.96	100	100	70-130	0	25
Cumene	10	9.43	10	9.01	94	90	70-130	5	25
1,2-Dibromoethane	10	9.34	10	9.57	93	96	65-126	2	25
1,2-Dichloroethane	10	10.74	10	10.99	107	110	70-130	2	25
Ethylbenzene	10	9.01	10	9.09	90	91	70-130	1	25
Methyl t-Butyl Ether	10	9.54	10	9.72	95	97	52-129	2	25
Naphthalene	10	8.30	10	8.24	83	82	35-153	1	25
Toluene	10	9.49	10	9.70	95	97	70-130	2	25
1,2,4-Trimethylbenzene	10	8.93	10	9.06	89	91	60-128	1	25
1,3,5-Trimethylbenzene	10	8.92	10	8.96	89	90	61-132	0	25
m/p-Xylene	10	9.08	10	9.21	91	92	70-130	1	25
o-Xylene	10	9.18	10	9.35	92	93	70-130	2	25

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 09/07/2016 15:09

Group Number: 1700638

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only: Acct. # 10177 Group # 1700658 Sample # 8553153-55 Bottle Order (SCR) # _____

Client Information

Client: Evergreen / GHD
Account #:
Project Name/#: Evergreen PES Philadelphia 11109613
Project Manager: David Steele
P.O. #:
Sampler: Alissa Cannon
Quote #:
Name of state where samples were collected: Pennsylvania

Turnaround Time Requested (TAT) (circle one)

Standard Rush (specify) _____

Data Package Required? Yes No

EDD Required? Yes No

	Temperature (F)		Pressure ("Hg)	
	Start	Stop	Start	Stop
Ambient				
Maximum				
Minimum				

Analyses Requested

☐ MTBE ☐ BTEX

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	~~Interior~~ Outdoor Temp. (F) (Start)	~~Interior~~ Outdoor Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
A016-AA16-001	08/25/2016 0714	08/25/2016 1631	-30	-03	69°	85°	303423	1023	6	10.2						
A016-AA16-002	08/25/2016 0733	08/25/2016 1632	-30	-05	68°	85°	930827	1118	6	10.3						
A016-AA16-003	08/25/2016 0747	08/25/2016 1641	-30	-04+	71°	85°	399408	1202	6	10.3						

Instructions/QC Requirements & Comments

Philadelphia Database

EPA 25 (check one): ☐ C1 - C4 ☐ C2 - C10 ☐ C1 - C10 ☐ C4 - C10 (GRO) ☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
16.00	8/16/16						
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
	8/26/2016 1200	A. [illegible]	8/26/16 1225	A. [illegible]	8/26/16 1915		
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
		A. [illegible]		A. [illegible]		E. Garcia	8/26/16 1915

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Sample Administration Receipt Documentation Log

Doc Log ID: 160433

Group Number(s): 1700638

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	08/26/2016 19:15
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	Yes
Extra Samples:	No	Flow Controller Quantity:	3
Discrepancy in Container Qty on COC:	No	Air Quality Returns:	No

Unpacked by Melvin Sanchez (8943) at 20:39 on 08/26/2016

2425 New Holland Pike
Lancaster, PA 17605-2425

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F 717-656-2681
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: October 04, 2016

Project: Philadelphia Refinery

Submittal Date: 08/26/2016
Group Number: 1700681
SDG: MHF72
PO Number: 11109626
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
GW-11109613-B-145-082416-KC-016 Grab Groundwater	8553508
GW-11109613-URS-4-082416-AC-017 Grab Groundwater	8553509
GW-11109613-B-132-082416-AC-018 Grab Groundwater	8553510
GW-11109613-B-150-082416-AC-019 Grab Groundwater	8553511
GW-11109613-URS-5-082416-AC-020 Grab Groundwater	8553512
GW-11109613-URS-5-082416-KC-021 Grab Groundwater	8553513
GW-11109613-B-39-082416-AC-022 Grab Groundwater	8553514
GW-11109613-B-39-082416-KC-023 Grab Groundwater	8553515
GW-11109613-URS-3-082416-KC-024 Grab Groundwater	8553516
GW-11109613-URS-3-082416-KC-025 Grab Groundwater	8553517
GW-11109613-B-116-082416-AC-026 Grab Groundwater	8553518
TB-11109613-082416-AC-03 Water	8553519
GW-11109613-B-116-082416-AC-027 Grab Groundwater	8553520
GW-11109613-B-116D-082416-AC-028 Grab Groundwater	8553521
GW-11109613-B-133D-082416-AC-029 Grab Groundwater	8553522
GW-11109613-B-133D-082416-AC-030 Grab Groundwater	8553523
TB-11109613-082516-AC-04 Water	8553524

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: GW-11109613-B-145-082416-KC-016 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553508
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 08:20 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7201 SDG#: MHF72-01

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	6		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	1		1	0.5	1
10945	Isopropylbenzene	98-82-8	74		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	2		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	1	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	2	J	2	0.5	1
10945	Xylene (Total)	1330-20-7	6		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	13		0.53	0.11	10
08357	Benzo(a)anthracene	56-55-3	0.67		0.053	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.22		0.053	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.24		0.053	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.071		0.053	0.011	1
08357	Chrysene	218-01-9	0.49		0.053	0.011	1
08357	Fluorene	86-73-7	50		0.53	0.11	10
08357	Naphthalene	91-20-3	3.3		0.063	0.032	1
08357	Phenanthrene	85-01-8	41		0.63	0.32	10
08357	Pyrene	129-00-0	5.4		0.053	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00013	J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	08/31/2016 21:49	Hu Yang	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-145-082416-KC-016 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553508
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 08:20 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7201 SDG#: MHF72-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162443AA	08/31/2016 21:49	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 11:44	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016 03:29	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 15:21	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:31	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-4-082416-AC-017 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553509
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 08:10 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7202 SDG#: MHF72-02

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	2	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.027 J	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.050	0.010	1
08357	Chrysene	218-01-9	N.D.	0.050	0.010	1
08357	Fluorene	86-73-7	0.022 J	0.050	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.060	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.060	0.030	1
08357	Pyrene	129-00-0	0.067	0.050	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D162452AA	09/01/2016 12:44	Daniel H Heller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-4-082416-AC-017 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553509
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 08:10 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7202 SDG#: MHF72-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D162452AA	09/01/2016 12:44	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 12:42	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 15:52	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:32	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-132-082416-AC-018 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553510
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 09:30 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7203 SDG#: MHF72-03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	5	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.5	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.88	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.49	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.57	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.17	0.050	0.010	1
08357	Chrysene	218-01-9	0.61	0.050	0.010	1
08357	Fluorene	86-73-7	27	0.50	0.10	10
08357	Naphthalene	91-20-3	N.D.	0.060	0.030	1
08357	Phenanthrene	85-01-8	20	0.60	0.30	10
08357	Pyrene	129-00-0	3.4	0.050	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00012 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	08/31/2016 20:00	Hu Yang	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-132-082416-AC-018 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553510
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 09:30 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7203 SDG#: MHF72-03

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162443AA	08/31/2016 20:00	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 13:11	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016 03:58	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 16:24	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:38	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-150-082416-AC-019 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553511
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 10:40 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7204 SDG#: MHF72-04

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	320,000	5,000	2,500	5000
10945	1,2-Dichloroethane	107-06-2	N.D.	50	25	50
10945	Ethylbenzene	100-41-4	270	50	25	50
10945	Isopropylbenzene	98-82-8	7,500	100	25	50
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	50	25	50
10945	Toluene	108-88-3	33,000	5,000	2,500	5000
10945	1,2,4-Trimethylbenzene	95-63-6	76 J	100	25	50
10945	1,3,5-Trimethylbenzene	108-67-8	31 J	100	25	50
10945	Xylene (Total)	1330-20-7	1,100	50	25	50
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.15 J	0.50	0.10	10
08357	Benzo(a)anthracene	56-55-3	0.10 J	0.50	0.10	10
08357	Benzo(a)pyrene	50-32-8	N.D.	0.50	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.50	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.50	0.10	10
08357	Chrysene	218-01-9	N.D.	0.50	0.10	10
08357	Fluorene	86-73-7	0.90	0.50	0.10	10
08357	Naphthalene	91-20-3	31	0.60	0.30	10
08357	Phenanthrene	85-01-8	1.2	0.60	0.30	10
08357	Pyrene	129-00-0	0.15 J	0.50	0.10	10

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00012 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	09/01/2016 02:11	Hu Yang	50

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-150-082416-AC-019 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553511
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 10:40 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7204 SDG#: MHF72-04

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D162452AA	09/01/2016 15:01	Daniel H Heller	5000
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162443AA	09/01/2016 02:11	Hu Yang	50
01163	GC/MS VOA Water Prep	SW-846 5030B	2	D162452AA	09/01/2016 15:01	Daniel H Heller	5000
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016 04:27	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 16:39	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:20	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-5-082416-AC-020 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553512
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 11:25 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7205 SDG#: MHF72-05

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	2,300		100	50	100
10945	1,2-Dichloroethane	107-06-2	N.D.		10	5	10
10945	Ethylbenzene	100-41-4	280		10	5	10
10945	Isopropylbenzene	98-82-8	13	J	20	5	10
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		10	5	10
10945	Toluene	108-88-3	1,500		10	5	10
10945	1,2,4-Trimethylbenzene	95-63-6	92		20	5	10
10945	1,3,5-Trimethylbenzene	108-67-8	27		20	5	10
10945	Xylene (Total)	1330-20-7	1,500		10	5	10
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	3.3		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.23		0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.058		0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.056		0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.017	J	0.051	0.010	1
08357	Chrysene	218-01-9	0.11		0.051	0.010	1
08357	Fluorene	86-73-7	1.5		0.051	0.010	1
08357	Naphthalene	91-20-3	150		1.2	0.61	20
08357	Phenanthrene	85-01-8	12		1.2	0.61	20
08357	Pyrene	129-00-0	1.7		0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken:
The sample was re-analyzed and internal standard areas are again outside of the QC acceptance limits, indicating a matrix effect.
The reported data is from the initial analysis of the sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	0.089		0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.		0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-5-082416-AC-020 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553512
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 11:25 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7205 SDG#: MHF72-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	09/01/2016	02:55	Hu Yang	10
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	09/01/2016	03:17	Hu Yang	100
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162443AA	09/01/2016	02:55	Hu Yang	10
01163	GC/MS VOA Water Prep	SW-846 5030B	2	F162443AA	09/01/2016	03:17	Hu Yang	100
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016	14:09	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016	05:25	Catherine E Bachman	20
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016	18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016	16:55	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016	14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016	00:39	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016	05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-5-082416-KC-021 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553513
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 13:50 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7206 SDG#: MHF72-06

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	4,900		200	100	200
10945	1,2-Dichloroethane	107-06-2	N.D.		20	10	20
10945	Ethylbenzene	100-41-4	530		20	10	20
10945	Isopropylbenzene	98-82-8	31	J	40	10	20
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		20	10	20
10945	Toluene	108-88-3	6,500		200	100	200
10945	1,2,4-Trimethylbenzene	95-63-6	230		40	10	20
10945	1,3,5-Trimethylbenzene	108-67-8	72		40	10	20
10945	Xylene (Total)	1330-20-7	2,800		20	10	20
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	4.8		0.51	0.10	10
08357	Benzo(a)anthracene	56-55-3	0.46	J	0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	0.15	J	0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	0.14	J	0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	N.D.		0.51	0.10	10
08357	Chrysene	218-01-9	0.25	J	0.51	0.10	10
08357	Fluorene	86-73-7	14		0.51	0.10	10
08357	Naphthalene	91-20-3	220		6.1	3.0	100
08357	Phenanthrene	85-01-8	21		0.61	0.30	10
08357	Pyrene	129-00-0	2.8		0.51	0.10	10

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.040	0.040	1

Reporting limits were raised due to interference from the sample matrix.

The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.

Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00014	J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-5-082416-KC-021 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553513
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 13:50 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7206 SDG#: MHF72-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	09/01/2016	03:39	Hu Yang	20
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	09/01/2016	04:00	Hu Yang	200
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162443AA	09/01/2016	03:39	Hu Yang	20
01163	GC/MS VOA Water Prep	SW-846 5030B	2	F162443AA	09/01/2016	04:00	Hu Yang	200
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016	05:54	Catherine E Bachman	10
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016	07:47	Catherine E Bachman	100
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016	18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016	17:42	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016	14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016	00:41	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016	05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-39-082416-AC-022 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553514
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 12:40 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7207 SDG#: MHF72-07

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	4		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	26		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	2		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	1	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	5		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	1.6		0.052	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.48		0.052	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.34		0.052	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.47		0.052	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.16		0.052	0.010	1
08357	Chrysene	218-01-9	0.43		0.052	0.010	1
08357	Fluorene	86-73-7	5.5		0.052	0.010	1
08357	Naphthalene	91-20-3	4.4		0.063	0.031	1
08357	Phenanthrene	85-01-8	6.0		0.063	0.031	1
08357	Pyrene	129-00-0	1.1		0.052	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	0.057		0.028	0.0094	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-analyzed outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0021		0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-39-082416-AC-022 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553514
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 12:40 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7207 SDG#: MHF72-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D162452AA	09/01/2016 13:07	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D162452AA	09/01/2016 13:07	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 15:07	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 17:57	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:43	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-39-082416-KC-023 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553515
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 13:15 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7208 SDG#: MHF72-08

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	3		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	17		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	2		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	0.6	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		2	0.5	1
10945	Xylene (Total)	1330-20-7	4		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.41		0.053	0.011	1
08357	Benzo(a)anthracene	56-55-3	0.086		0.053	0.011	1
08357	Benzo(a)pyrene	50-32-8	0.071		0.053	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	0.083		0.053	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	0.057		0.053	0.011	1
08357	Chrysene	218-01-9	0.090		0.053	0.011	1
08357	Fluorene	86-73-7	3.0		0.053	0.011	1
08357	Naphthalene	91-20-3	N.D.		0.064	0.032	1
08357	Phenanthrene	85-01-8	0.86		0.064	0.032	1
08357	Pyrene	129-00-0	0.35		0.053	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0047		0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162443AA	08/31/2016 22:11	Hu Yang	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-39-082416-KC-023 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553515
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 13:15 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7208 SDG#: MHF72-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162443AA	08/31/2016 22:11	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 15:36	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 18:13	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:44	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-3-082416-KC-024 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553516
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 14:39 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

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Suite #3
Niagara Falls NY 14304

F7209 SDG#: MHF72-09

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	2		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	2	J	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	0.9	J	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	0.7	J	2	0.5	1
10945	Xylene (Total)	1330-20-7	8		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.17		0.054	0.011	1
08357	Benzo(a)anthracene	56-55-3	5.3		0.054	0.011	1
08357	Benzo(a)pyrene	50-32-8	4.5		0.054	0.011	1
08357	Benzo(b)fluoranthene	205-99-2	5.4		0.054	0.011	1
08357	Benzo(g,h,i)perylene	191-24-2	1.4		0.054	0.011	1
08357	Chrysene	218-01-9	3.9		0.054	0.011	1
08357	Fluorene	86-73-7	4.9		0.054	0.011	1
08357	Naphthalene	91-20-3	N.D.		0.065	0.032	1
08357	Phenanthrene	85-01-8	2.5		0.065	0.032	1
08357	Pyrene	129-00-0	8.4		0.054	0.011	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Sufficient sample was not available to repeat the analysis.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162444AA	08/31/2016 23:26	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162444AA	08/31/2016 23:26	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 16:05	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 18:28	Heather M Miller	1

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Analysis Report

Sample Description: GW-11109613-URS-3-082416-KC-024 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8553516
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 14:39 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7209 SDG#: MHF72-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-3-082416-KC-025 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553517
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 15:26 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7210 SDG#: MHF72-10

CAT No.	Analysis Name	CAS Number	Result		Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10945	Benzene	71-43-2	1		1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.		1	0.5	1
10945	Isopropylbenzene	98-82-8	17		2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		1	0.5	1
10945	Toluene	108-88-3	1		1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	0.5	J	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	0.8	J	2	0.5	1
10945	Xylene (Total)	1330-20-7	7		1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	9.6		0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	17		0.51	0.10	10
08357	Benzo(a)pyrene	50-32-8	12		0.51	0.10	10
08357	Benzo(b)fluoranthene	205-99-2	14		0.51	0.10	10
08357	Benzo(g,h,i)perylene	191-24-2	3.2		0.051	0.010	1
08357	Chrysene	218-01-9	12		0.51	0.10	10
08357	Fluorene	86-73-7	28		0.51	0.10	10
08357	Naphthalene	91-20-3	N.D.		0.061	0.030	1
08357	Phenanthrene	85-01-8	40		0.61	0.30	10
08357	Pyrene	129-00-0	31		0.51	0.10	10

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial.

Volatiles by Extraction	**SW-846 8011**		**ug/l**		**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.		0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**		**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.0021		0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162444AA	08/31/2016 23:48	Hu Yang	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-URS-3-082416-KC-025 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553517
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 15:26 by KC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7210 SDG#: MHF72-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162444AA	08/31/2016 23:48	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 16:35	Catherine E Bachman	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/07/2016 06:23	Catherine E Bachman	10
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 18:44	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:46	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-116-082416-AC-026 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553518
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 14:40 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7211 SDG#: MHF72-11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.036 J	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.021 J	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.050	0.010	1
08357	Chrysene	218-01-9	0.031 J	0.050	0.010	1
08357	Fluorene	86-73-7	0.054	0.050	0.010	1
08357	Naphthalene	91-20-3	0.031 J	0.060	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.060	0.030	1
08357	Pyrene	129-00-0	0.29	0.050	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162444AA	08/31/2016 21:15	Hu Yang	1

*=This limit was used in the evaluation of the final result

Sample Description: GW-11109613-B-116-082416-AC-026 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553518
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 14:40 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7211 SDG#: MHF72-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162444AA	08/31/2016 21:15	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 17:04	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 19:00	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:48	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-082416-AC-03 Water
Philadelphia Refinery

LL Sample # WW 8553519
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/24/2016 16:00

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7212 SDG#: MHF72-12TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162444AA	08/31/2016 20:09	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162444AA	08/31/2016 20:09	Hu Yang	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 19:15	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-116-082416-AC-027 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553520
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 12:25 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7213 SDG#: MHF72-13

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.11	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.045 J	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.018 J	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.023 J	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.051	0.010	1
08357	Chrysene	218-01-9	0.059	0.051	0.010	1
08357	Fluorene	86-73-7	1.1	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.061	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.061	0.030	1
08357	Pyrene	129-00-0	0.39	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.028	0.0094	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00014 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D162452AA	09/01/2016 13:30	Daniel H Heller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-116-082416-AC-027 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553520
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 12:25 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7213 SDG#: MHF72-13

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D162452AA	09/01/2016 13:30	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 17:31	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 19:31	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:50	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-116D-082416-AC-028 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8553521
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 12:35 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7214 SDG#: MHF72-14

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.080	0.051	0.010	1
08357	Benzo(a)anthracene	56-55-3	0.028 J	0.051	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.051	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.051	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.051	0.010	1
08357	Chrysene	218-01-9	0.039 J	0.051	0.010	1
08357	Fluorene	86-73-7	0.91	0.051	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.062	0.031	1
08357	Phenanthrene	85-01-8	N.D.	0.062	0.031	1
08357	Pyrene	129-00-0	0.32	0.051	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00016 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D162452AA	09/01/2016 13:53	Daniel H Heller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-116D-082416-AC-028 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8553521
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 12:35 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7214 SDG#: MHF72-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D162452AA	09/01/2016 13:53	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 17:59	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 19:46	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:51	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

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Analysis Report

Sample Description: GW-11109613-B-133D-082416-AC-029 Grab Groundwater
Philadelphia Refinery

LL Sample # WW 8553522
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 13:45 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

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Suite #3
Niagara Falls NY 14304

F7215 SDG#: MHF72-15

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	N.D.	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.050	0.010	1
08357	Chrysene	218-01-9	N.D.	0.050	0.010	1
08357	Fluorene	86-73-7	N.D.	0.050	0.010	1
08357	Naphthalene	91-20-3	0.039 J	0.060	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.060	0.030	1
08357	Pyrene	129-00-0	N.D.	0.050	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:
Naphthalene was not detected in the re-extracted sample.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	0.00048 J	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-133D-082416-AC-029 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553522
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 13:45 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7215 SDG#: MHF72-15

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162444AA	09/01/2016 00:54	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162444AA	09/01/2016 00:54	Hu Yang	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 18:27	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 20:02	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:53	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-133D-082416-AC-030 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553523
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 15:10 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7216 SDG#: MHF72-16

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	1	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Anthracene	120-12-7	0.18	0.050	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.050	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.050	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.050	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.050	0.010	1
08357	Chrysene	218-01-9	N.D.	0.050	0.010	1
08357	Fluorene	86-73-7	0.014 J	0.050	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.060	0.030	1
08357	Phenanthrene	85-01-8	0.55	0.060	0.030	1
08357	Pyrene	129-00-0	N.D.	0.050	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0095	1
Metals	**SW-846 6020**		**mg/l**	**mg/l**	**mg/l**	
06035	Lead	7439-92-1	N.D.	0.0010	0.000090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	D162452AA	09/01/2016 14:15	Daniel H Heller	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: GW-11109613-B-133D-082416-AC-030 Grab Groundwater Philadelphia Refinery

LL Sample # WW 8553523
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 15:10 by AC

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7216 SDG#: MHF72-16

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	D162452AA	09/01/2016 14:15	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16244WAC026	09/06/2016 18:55	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16244WAC026	08/31/2016 18:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 20:49	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	162526050004A	09/12/2016 00:58	Tara L Snyder	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	162526050004	09/09/2016 05:55	Lisa J Cooke	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-11109613-082516-AC-04 Water
Philadelphia Refinery

LL Sample # WW 8553524
LL Group # 1700681
Account # 10177

Project Name: Philadelphia Refinery

Collected: 08/25/2016 16:00

Submitted: 08/26/2016 19:15
Reported: 10/04/2016 12:12

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

F7217 SDG#: MHF72-17TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10945	Benzene	71-43-2	N.D.	1	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	1	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	1	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1	0.5	1
10945	Toluene	108-88-3	N.D.	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	2	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	1	0.5	1
Volatiles by Extraction	**SW-846 8011**		**ug/l**	**ug/l**	**ug/l**	
10398	Ethylene dibromide	106-93-4	N.D.	0.029	0.0096	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F162444AA	08/31/2016 20:31	Hu Yang	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162444AA	08/31/2016 20:31	Hu Yang	1
10398	EDB in Wastewater	SW-846 8011	1	162460005A	09/09/2016 21:04	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162460005A	09/08/2016 14:00	Edwin Ortiz	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 10/04/2016 12:12

Group Number: 1700681

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Batch number: D162452AA	Sample number(s): 8553509,8553511,8553514,8553520-8553521,8553523		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: F162443AA	Sample number(s): 8553508,8553510-8553513,8553515		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: F162444AA	Sample number(s): 8553516-8553519,8553522,8553524		
Benzene	N.D.	1	0.5
1,2-Dichloroethane	N.D.	1	0.5
Ethylbenzene	N.D.	1	0.5
Isopropylbenzene	N.D.	2	0.5
Methyl Tertiary Butyl Ether	N.D.	1	0.5
Toluene	N.D.	1	0.5
1,2,4-Trimethylbenzene	N.D.	2	0.5
1,3,5-Trimethylbenzene	N.D.	2	0.5
Xylene (Total)	N.D.	1	0.5
Batch number: 16244WAC026	Sample number(s): 8553508-8553518,8553520-8553523		
Anthracene	N.D.	0.050	0.010
Benzo(a)anthracene	N.D.	0.050	0.010
Benzo(a)pyrene	N.D.	0.050	0.010
Benzo(b)fluoranthene	N.D.	0.050	0.010
Benzo(g,h,i)perylene	N.D.	0.050	0.010
Chrysene	N.D.	0.050	0.010
Fluorene	N.D.	0.050	0.010
Naphthalene	N.D.	0.060	0.030
Phenanthrene	N.D.	0.060	0.030
Pyrene	N.D.	0.050	0.010
Batch number: 162460005A	Sample number(s): 8553508-8553524		

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 10/04/2016 12:12

Group Number: 1700681

Method Blank (continued)

Analysis Name	Result	LOQ**	MDL
	ug/l	ug/l	ug/l
Ethylene dibromide	N.D.	0.030	0.010
	mg/l	mg/l	mg/l
Batch number: 162526050004A	Sample number(s): 8553508-8553515,8553517-8553518,8553520-8553523		
Lead	N.D.	0.0010	0.000090

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: D162452AA	Sample number(s): 8553509,8553511,8553514,8553520-8553521,8553523								
Benzene	20	16.3	20	17.61	81	88	78-120	8	30
1,2-Dichloroethane	20	16.91	20	17.96	85	90	66-128	6	30
Ethylbenzene	20	16.17	20	17.35	81	87	78-120	7	30
Isopropylbenzene	20	16.51	20	17.81	83	89	80-120	8	30
Methyl Tertiary Butyl Ether	20	17.18	20	18.04	86	90	75-120	5	30
Toluene	20	16.17	20	17.47	81	87	80-120	8	30
1,2,4-Trimethylbenzene	20	15.79	20	17	79	85	75-120	7	30
1,3,5-Trimethylbenzene	20	15.92	20	17.21	80	86	75-120	8	30
Xylene (Total)	60	49.21	60	52.9	82	88	80-120	7	30
Batch number: F162443AA	Sample number(s): 8553508,8553510-8553513,8553515								
Benzene	20	17.55			88		78-120		
1,2-Dichloroethane	20	17.64			88		66-128		
Ethylbenzene	20	17.39			87		78-120		
Isopropylbenzene	20	17.72			89		80-120		
Methyl Tertiary Butyl Ether	20	16.36			82		75-120		
Toluene	20	17.63			88		80-120		
1,2,4-Trimethylbenzene	20	17.62			88		75-120		
1,3,5-Trimethylbenzene	20	17.86			89		75-120		
Xylene (Total)	60	52.21			87		80-120		
Batch number: F162444AA	Sample number(s): 8553516-8553519,8553522,8553524								
Benzene	20	17.79			89		78-120		
1,2-Dichloroethane	20	17.27			86		66-128		
Ethylbenzene	20	17.44			87		78-120		
Isopropylbenzene	20	17.96			90		80-120		
Methyl Tertiary Butyl Ether	20	16.83			84		75-120		
Toluene	20	17.21			86		80-120		
1,2,4-Trimethylbenzene	20	17.43			87		75-120		
1,3,5-Trimethylbenzene	20	18.26			91		75-120		
Xylene (Total)	60	52.82			88		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16244WAC026	Sample number(s): 8553508-8553518,8553520-8553523								
Anthracene	1.00	0.909	1.00	0.842	91	84	68-109	8	30
Benzo(a)anthracene	1.00	0.876	1.00	0.718	88	72	66-111	20	30

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Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 10/04/2016 12:12

Group Number: 1700681

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(a)pyrene	1.00	0.860	1.00	0.630	86	63*	66-111	31*	30
Benzo(b)fluoranthene	1.00	0.877	1.00	0.675	88	67*	69-117	26	30
Benzo(g,h,i)perylene	1.00	0.762	1.00	0.406	76	41*	56-115	61*	30
Chrysene	1.00	0.854	1.00	0.672	85	67	66-105	24	30
Fluorene	1.00	0.908	1.00	0.858	91	86	66-110	6	30
Naphthalene	1.00	0.860	1.00	0.832	86	83	61-112	3	30
Phenanthrene	1.00	0.891	1.00	0.842	89	84	70-107	6	30
Pyrene	1.00	0.837	1.00	0.766	84	77	60-108	9	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 162460005A	Sample number(s): 8553508-8553524								
Ethylene dibromide	0.128	0.127	0.128	0.129	100	101	60-140	1	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 162526050004A	Sample number(s): 8553508-8553515,8553517-8553518,8553520-8553523								
Lead	0.0150	0.0150			100		80-120		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: F162443AA	Sample number(s): 8553508,8553510-8553513,8553515 UNSPK: 8553510									
Benzene	N.D.	20	18.61	20	19.25	93	96	78-120	3	30
1,2-Dichloroethane	N.D.	20	17.83	20	18.61	89	93	66-128	4	30
Ethylbenzene	N.D.	20	18	20	18.75	90	94	78-120	4	30
Isopropylbenzene	5.32	20	22.2	20	24.24	84	95	80-120	9	30
Methyl Tertiary Butyl Ether	N.D.	20	16.54	20	17.4	83	87	75-120	5	30
Toluene	N.D.	20	18.37	20	19	92	95	80-120	3	30
1,2,4-Trimethylbenzene	N.D.	20	17.27	20	18.53	86	93	75-120	7	30
1,3,5-Trimethylbenzene	N.D.	20	18.37	20	19.52	92	98	75-120	6	30
Xylene (Total)	N.D.	60	53.57	60	56.89	89	95	80-120	6	30
Batch number: F162444AA	Sample number(s): 8553516-8553519,8553522,8553524 UNSPK: 8553518									
Benzene	N.D.	20	19.67	20	20.31	98	102	78-120	3	30
1,2-Dichloroethane	N.D.	20	18.71	20	19.43	94	97	66-128	4	30
Ethylbenzene	N.D.	20	19.38	20	20.05	97	100	78-120	3	30
Isopropylbenzene	N.D.	20	20.06	20	21.36	100	107	80-120	6	30
Methyl Tertiary Butyl Ether	N.D.	20	18.02	20	18.93	90	95	75-120	5	30
Toluene	N.D.	20	18.85	20	19.55	94	98	80-120	4	30
1,2,4-Trimethylbenzene	N.D.	20	18.59	20	20.18	93	101	75-120	8	30
1,3,5-Trimethylbenzene	N.D.	20	18.7	20	19.46	94	97	75-120	4	30
Xylene (Total)	N.D.	60	57.73	60	60.89	96	101	80-120	5	30

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Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 10/04/2016 12:12

Group Number: 1700681

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 162460005A	Sample number(s): 8553508-8553524 UNSPK: 8553508									
Ethylene dibromide	N.D.	0.122	0.122			100		60-140		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 162526050004A	Sample number(s): 8553508-8553515,8553517-8553518,8553520-8553523 UNSPK: 8553511									
Lead	0.000124	0.0150	0.0155	0.0150	0.0157	103	104	75-125	1	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 162460005A	Sample number(s): 8553508-8553524 BKG: 8553509			
Ethylene dibromide	N.D.	N.D.	0 (1)	30
	mg/l	mg/l		
Batch number: 162526050004A	Sample number(s): 8553508-8553515,8553517-8553518,8553520-8553523 BKG: 8553511			
Lead	0.000124	0.000136	10 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: D162452AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8553509	102	96	94	99
8553514	101	94	94	103
8553520	101	96	95	98
8553521	101	95	95	99
8553523	101	97	94	98
Blank	100	95	95	98
LCS	101	96	94	101
LCSD	101	96	95	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: F162443AA

*- Outside of specification
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Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 10/04/2016 12:12

Group Number: 1700681

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8553508	96	99	99	102
8553510	98	102	100	99
8553511	86	89	100	100
8553512	96	97	99	103
8553513	98	95	100	103
8553515	98	99	100	101
Blank	98	97	101	96
LCS	97	101	101	99
MS	97	100	101	101
MSD	98	102	101	102
Limits:	80-116	77-113	80-113	78-113

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs
Batch number: F162444AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8553516	99	99	100	98
8553517	99	99	100	104
8553518	100	101	100	100
8553519	100	100	100	100
8553522	99	100	101	97
8553524	101	100	99	101
Blank	99	99	100	96
LCS	100	104	99	99
MS	99	100	99	100
MSD	100	101	100	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 16244WAC026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8553508	126	82	72
8553509	70	77	72
8553510	123	86	88
8553511	68	81	72
8553512	103	86	63
8553513	82	68	131*
8553514	114	83	117
8553515	92	80	85
8553516	124	82	105
8553517	113	77	80
8553518	95	76	76
8553520	82	78	82
8553521	85	83	82
8553522	100	76	78
8553523	82	74	76
Blank	89	78	77
LCS	93	86	83

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Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 10/04/2016 12:12

Group Number: 1700681

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
LCSD	84	62	77
Limits:	51-128	34-130	45-119

Analysis Name: EDB in Wastewater
Batch number: 162460005A

	1,1,2,2-Tetrachloroethane
8553508	113
8553509	105
8553510	113
8553511	116
8553512	142*
8553513	140*
8553514	155*
8553515	108
8553516	125
8553517	110
8553518	113
8553519	109
8553520	109
8553521	109
8553522	108
8553523	97
8553524	110
Blank	111
DUP	107
LCS	104
LCSD	101
MS	106
Limits:	46-136

*- Outside of specification
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Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1700681 Sample # 8553508-24

1 of 2

COC # 507702

Client Information

Client: Evergreen / GHD	Acct. #:
Project Name/#: Evergreen PES 11109613	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Alissa Cannon	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only: FSC: ____ SCR#: ____

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Lead (Field Filtered)	EDB	BTEX/MTBE/Kumene/EDC/TMB	PAHs in Wastewater SIM	Remarks
GW-11109613-B-145-082416-KC-016	08/24/16	0820	8			8		8	1	2	3	2	Philadelphia Database
GW-11109613-URS-4-082416-AC-017	↓	0810	8			8		8	1	2	3	2	
GW-11109613-B-132-082416-AC-018		0930	8			8		8	1	2	3	2	
GW-11109613-B-150-082416-AC-019		1040	8			8		8	1	2	3	2	
GW-11109613-URS-5-082416-AC-020		1125	8			8		8	1	2	3	2	
GW-11109613-URS-5-082416-KC-021		1350	8			8		8	1	2	3	2	
GW-11109613-B-39-082416-AC-022		1240	8			8		8	1	2	3	2	
GW-11109613-B-39-082416-KC-023		1315	8			8		8	1	2	3	2	
GW-11109613-URS-3-082416-KC-024		1439	8			8		8	1	2	3	2	
GW-11109613-URS-3-082416-KC-025	↓	1526	8			8		8	1	2	3	2	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	8/26/16	1200	[signature]	8/26/16	1225
[signature]	8/26/16	1950			
			[signature]	8-26-16	1915

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 20-4.8 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1700681 Sample # 8553508-24

2 of 2

COC # 507701

Client Information

Client: Evergreen / GHD	Acct. #:
Project Name/#: Evergreen PES 11109613	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Alissa Cannon	Quote #:
State where samples were collected: Pennsylvania	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only: FSC: ____ SCR#: ____

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Lead (Field filtered)	EDB	BTEX/MTBE/Cumene/EDC/TMB	PAHs in wastewater SIM	Remarks
GW-11109613-B-116-082416-AL-026	08/24/16	1440	8			8		8	1	2	3	2	Philadelphia Database
TB-11109613-082416-AL-03-	↓	1600					4	4		2	2	~~2~~	
GW-11109613-B-116-082416-AL-027	08/25/16	1225	8			8		8	1	2	3	2	
GW-11109613-B-116D-082416-AL-028	↓	1235	8			8		8	1	2	3	2	
GW-11109613-B-133D-082416-AL-029	↓	1345	8			8		8	1	2	3	2	
GW-11109613-B-133D-082416-AL-030	↓	1510	8			8		8	1	2	3	2	
TB-11109613-082516-AL-04	↓	1600					4	4		2	2		

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
[signature]	8/26/16	1200	[signature]	8/26/16	1225
[signature]	8/26/16	1915			
			[signature]	8-26-16	1915

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 20-9.8 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0216

Page 42 of 44

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Sample Administration Receipt Documentation Log

Doc Log ID: 160458

Group Number(s): L700681

Client: Evergreen

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	08/26/2016 19:15
Number of Packages:	4	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	12
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

Unpacked by Cory Jeremiah (10469) at 00:06 on 08/27/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	4.4	DT	Wet	Y	Bagged	N
2	DT146	3.7	DT	Wet	Y	Bagged	N
3	DT146	2.0	DT	Wet	Y	Bagged	N
4	DT146	4.8	DT	Wet	Y	Bagged	N

Container Quantity Discrepancy Details

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
AC-019	9	8	
AC-024	6	8	

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Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: January 19, 2017

Project: Philadelphia Refinery

Submittal Date: 01/06/2017
Group Number: 1751531
SDG: MHF79
PO Number: 11109626
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-BH-17-03-0-2-SOIL Grab Soil	8776339
AOI6-BH-17-04-0-2-SOIL Grab Soil	8776340
AOI6-BH-17-05-0-2-SOIL Grab Soil	8776342
AOI6-BH-17-09-0-2-SOIL Grab Soil	8776344
AOI6-BH-17-02-0-2-SOIL Grab Soil	8776346
AOI6-BH-17-01-0-2-SOIL Grab Soil	8776347

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-BH-17-03-0-2-SOIL Grab Soil
Philadelphia Refinery

LL Sample # SW 8776339
LL Group # 1751531
Account # 10177

Project Name: Philadelphia Refinery

Collected: 01/06/2017 08:42 by KC

Submitted: 01/06/2017 17:15
Reported: 01/19/2017 16:38

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B17-3 SDG#: MHF79-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	899 Q4	1.20	0.439	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	11.7	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06955	Lead	SW-846 6010B	1	170095708001	01/10/2017 13:05	Eric L Eby	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170095708001	01/09/2017 15:45	JoElla L Rice	1
00111	Moisture	SM 2540 G-1997	1	17010820003A	01/10/2017 10:59	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

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Sample Description: AOI6-BH-17-04-0-2-SOIL Grab Soil
Philadelphia Refinery

LL Sample # SW 8776340
LL Group # 1751531
Account # 10177

Project Name: Philadelphia Refinery

Collected: 01/06/2017 09:20 by KC

Submitted: 01/06/2017 17:15
Reported: 01/19/2017 16:38

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B17-4 SDG#: MHF79-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	7,490 Q4	17.7	6.50	10
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	33.9	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06955	Lead	SW-846 6010B	1	170095708001	01/10/2017 13:57	Eric L Eby	10
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170095708001	01/09/2017 15:45	JoElla L Rice	1
00111	Moisture	SM 2540 G-1997	1	17010820003A	01/10/2017 10:59	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-17-05-0-2-SOIL Grab Soil
Philadelphia Refinery

LL Sample # SW 8776342
LL Group # 1751531
Account # 10177

Project Name: Philadelphia Refinery

Collected: 01/06/2017 10:36 by KC

Submitted: 01/06/2017 17:15
Reported: 01/19/2017 16:38

Evergreen c/o GHD
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B17-5 SDG#: MHF79-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	770 Q4	1.29	0.475	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	13.5	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06955	Lead	SW-846 6010B	1	170095708001	01/10/2017 13:12	Eric L Eby	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170095708001	01/09/2017 15:45	JoElla L Rice	1
00111	Moisture	SM 2540 G-1997	1	17010820003A	01/10/2017 10:59	Larry E Bevins	1

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Analysis Report

Sample Description: AOI6-BH-17-09-0-2-SOIL Grab Soil
Philadelphia Refinery

LL Sample # SW 8776344
LL Group # 1751531
Account # 10177

Project Name: Philadelphia Refinery

Collected: 01/06/2017 12:06 by KC

Submitted: 01/06/2017 17:15
Reported: 01/19/2017 16:38

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B17-9 SDG#: MHF79-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	34.3 Q4	1.23	0.452	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	11.1	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06955	Lead	SW-846 6010B	1	170135708008	01/16/2017 18:14	Cindy M Gehman	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170135708008	01/13/2017 16:25	JoElla L Rice	1
00111	Moisture	SM 2540 G-1997	1	17012820006B	01/12/2017 21:15	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-17-02-0-2-SOIL Grab Soil
Philadelphia Refinery

LL Sample # SW 8776346
LL Group # 1751531
Account # 10177

Project Name: Philadelphia Refinery

Collected: 01/06/2017 13:03 by KC

Submitted: 01/06/2017 17:15
Reported: 01/19/2017 16:38

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B17-2 SDG#: MHF79-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	234 Q4	7.70	2.82	5
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00111	Moisture	n.a.	20.8	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06955	Lead	SW-846 6010B	1	170095708001	01/10/2017 14:01	Eric L Eby	5
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170095708001	01/09/2017 15:45	JoElla L Rice	1
00111	Moisture	SM 2540 G-1997	1	17010820003A	01/10/2017 10:59	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: AOI6-BH-17-01-0-2-SOIL Grab Soil
Philadelphia Refinery

LL Sample # SW 8776347
LL Group # 1751531
Account # 10177

Project Name: Philadelphia Refinery

Collected: 01/06/2017 13:26 by KC

Submitted: 01/06/2017 17:15
Reported: 01/19/2017 16:38

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

B17-1 SDG#: MHF79-09

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
Metals		**SW-846 6010B**	**mg/kg**	**mg/kg**	**mg/kg**	
06955	Lead	7439-92-1	211 Q4	1.33	0.488	1
Wet Chemistry		**SM 2540 G-1997**	**%**	**%**	**%**	
00111	Moisture	n.a.	17.7	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06955	Lead	SW-846 6010B	1	170095708001	01/10/2017 13:19	Eric L Eby	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	170095708001	01/09/2017 15:45	JoElla L Rice	1
00111	Moisture	SM 2540 G-1997	1	17010820003A	01/10/2017 10:59	Larry E Bevins	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 01/19/2017 16:38

Group Number: 1751531

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result mg/kg	LOQ** mg/kg	MDL mg/kg
Batch number: 170095708001	Sample number(s): 8776339-8776340,8776342,8776346-8776347		
Lead	N.D.	1.50	0.550
Batch number: 170135708008	Sample number(s): 8776344		
Lead	N.D.	1.50	0.550

LCS/LCSD

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 170095708001	Sample number(s): 8776339-8776340,8776342,8776346-8776347								
Lead	15	14.86			99		80-120		
Batch number: 170135708008	Sample number(s): 8776344								
Lead	15	16.06			107		80-120		
	%	%	%	%					
Batch number: 17010820003A	Sample number(s): 8776339-8776340,8776342,8776346-8776347								
Moisture	89.5	89.41			100		99-101		
Batch number: 17012820006B	Sample number(s): 8776344								
Moisture	89.5	89.41			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 170095708001	Sample number(s): 8776339-8776340,8776342,8776346-8776347 UNSPK: P769775									
Lead	86.09	14.29	91.76	14.15	102.92	40 (2)	119 (2)	75-125	11	20
Batch number: 170135708008	Sample number(s): 8776344 UNSPK: P782094									

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 01/19/2017 16:38

Group Number: 1751531

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Lead	127.3	13.04	157	13.76	163.29	228 (2)	262 (2)	75-125	4	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 170095708001	Sample number(s): 8776339-8776340,8776342,8776346-8776347 BKG: P769775			
Lead	86.09	79.6	8	20
Batch number: 170135708008	Sample number(s): 8776344 BKG: P782094			
Lead	127.3	139.25	9	20
	%	%		
Batch number: 17010820003A	Sample number(s): 8776339-8776340,8776342,8776346-8776347 BKG: P766083			
Moisture	N.D.	N.D.	0 (1)	5
Batch number: 17012820006B	Sample number(s): 8776344 BKG: P776297			
Moisture	18.2	17.26	5	5

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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3/4/6/17 1477

For Eurofins Lancaster Laboratories Environmental use only

Acct. # ~~1011~~ Group # 1751531 Sample # 8776339-48

COC # 518255

Client Information	
Client: GHD	Acct. #:
Project Name/#: Evergreen PES AOI6	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Kevin Curry	Quote #: 11109613-001
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

Matrix: Soil ☒ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC: ____
SCR#: 199780

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil ☒ Sediment	Water: Potable	Water: NPDES	Other:	Total # of Containers	Lead by SW-846 6010	Remarks
AOI6-BH-17-03-0-2-SOIL	1/6/17	842	X						1	X	
AOI6-BH-17-04-0-2-SOIL	1/6/17	920	X						1	X	
AOI6-BH-17-08-0-2-SOIL	1/6/17	958	X						1	X	HOLD
AOI6-BH-17-05-0-2-SOIL	1/6/17	1036	X						1	X	
AOI6-BH-17-10-0-2-SOIL	1/6/17	1124	X						1	X	HOLD
AOI6-BH-17-09-0-2-SOIL	1/6/17	1206	X						1	X	HOLD
AOI6-BH-17-06-0-2-SOIL	1/6/17	1234	X						1	X	HOLD
AOI6-BH-17-02-0-2-SOIL	1/6/17	1303	X						1	X	
AOI6-BH-17-01-0-2-SOIL	1/6/17	1326	X						1	X	
AOI6-BH-17-07-0-2-SOIL	1/6/17	1336	X						1	X	HOLD

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: 3days

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	1/3/18	0920			
[signature]	1/6/17	1715			
			[signature]	1/6/17	1715

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format: GHD EQUIS, Statec EDDs

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.8 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0216

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 172424
Group Number(s): 1751531

Client: GHD

Delivery and Receipt Information

Delivery Method:	Client Drop Off	Arrival Timestamp:	01/06/2017 17:15
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Melvin Sanchez (8943) at 17:33 on 01/06/2017

Samples Chilled Details

Thermometer Types: DT, = Digital (Temp. Bottle) IR = Infrared (Surface Temp) , All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.8	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Additional Data Qualifiers

Qualifier	Definition
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

March 28, 2017

David Steele
GHD
410 Eagleview Blvd.
Exton, PA 19341

RE: Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Dear David Steele:
Enclosed are the analytical results for sample(s) received by the laboratory on March 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nathan Boberg
nathan.boberg@pacelabs.com
(612)607-6407
Project Manager

Enclosures

cc: Paul McMahon, GHD

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CERTIFICATIONS

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: UST-078
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: MN00064
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia WW Certification #: 382
Wisconsin Certification #: 999407970
Wyoming via EPA Region 8 Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10381753001	**AOI8-AI-17-12**	Air	03/09/17 16:33	03/14/17 10:30
10381753002	**AOI8-AA-17-03**	Air	03/09/17 16:50	03/14/17 10:30
10381753003	**AOI6-AI-17-05**	Air	03/09/17 15:29	03/14/17 10:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10381753001	**AOI8-AI-17-12**	TO-15	MJL	13
10381753002	**AOI8-AA-17-03**	TO-15	MJL	13
10381753003	**AOI6-AI-17-05**	TO-15	MLS	13

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Sample: AOI8-AI-17-12 **Lab ID: 10381753001** Collected: 03/09/17 16:33 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.4**	ug/m3	1.0	0.19	1.55		03/21/17 23:14	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/21/17 23:14	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	1.3	0.32	1.55		03/21/17 23:14	107-06-2	
Ethylbenzene	**1.8J**	ug/m3	3.4	0.66	1.55		03/21/17 23:14	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/21/17 23:14	98-82-8	
Methyl-tert-butyl ether	**<0.47**	ug/m3	5.7	0.47	1.55		03/21/17 23:14	1634-04-4	
Naphthalene	**3.7J**	ug/m3	4.1	0.47	1.55		03/21/17 23:14	91-20-3	
Toluene	**3.6**	ug/m3	1.2	0.24	1.55		03/21/17 23:14	108-88-3	
1,2,4-Trimethylbenzene	**2.6J**	ug/m3	3.9	0.19	1.55		03/21/17 23:14	95-63-6	
1,3,5-Trimethylbenzene	**2.2J**	ug/m3	3.9	0.28	1.55		03/21/17 23:14	108-67-8	
Xylene (Total)	**6.0**	ug/m3	4.1	1.8	1.55		03/21/17 23:14	1330-20-7	
m&p-Xylene	**4.0**	ug/m3	2.7	1.2	1.55		03/21/17 23:14	179601-23-1	
o-Xylene	**2.0J**	ug/m3	3.4	0.54	1.55		03/21/17 23:14	95-47-6	

Sample: AOI8-AA-17-03 **Lab ID: 10381753002** Collected: 03/09/17 16:50 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.2J**	ug/m3	1.7	0.33	2.69		03/21/17 23:52	71-43-2	
1,2-Dibromoethane (EDB)	**<2.1**	ug/m3	4.2	2.1	2.69		03/21/17 23:52	106-93-4	
1,2-Dichloroethane	**<0.55**	ug/m3	2.2	0.55	2.69		03/21/17 23:52	107-06-2	
Ethylbenzene	**2.6J**	ug/m3	5.9	1.1	2.69		03/21/17 23:52	100-41-4	
Isopropylbenzene (Cumene)	**<0.37**	ug/m3	6.7	0.37	2.69		03/21/17 23:52	98-82-8	
Methyl-tert-butyl ether	**<0.82**	ug/m3	9.9	0.82	2.69		03/21/17 23:52	1634-04-4	
Naphthalene	**<0.82**	ug/m3	7.2	0.82	2.69		03/21/17 23:52	91-20-3	
Toluene	**1.3J**	ug/m3	2.1	0.41	2.69		03/21/17 23:52	108-88-3	
1,2,4-Trimethylbenzene	**3.6J**	ug/m3	6.7	0.34	2.69		03/21/17 23:52	95-63-6	
1,3,5-Trimethylbenzene	**<0.49**	ug/m3	6.7	0.49	2.69		03/21/17 23:52	108-67-8	
Xylene (Total)	**<3.1**	ug/m3	7.1	3.1	2.69		03/21/17 23:52	1330-20-7	
m&p-Xylene	**4.6J**	ug/m3	4.8	2.1	2.69		03/21/17 23:52	179601-23-1	
o-Xylene	**2.5J**	ug/m3	5.9	0.94	2.69		03/21/17 23:52	95-47-6	

Sample: AOI6-AI-17-05 **Lab ID: 10381753003** Collected: 03/09/17 15:29 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.76J**	ug/m3	0.87	0.16	1.34		03/22/17 17:14	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	2.1	1.0	1.34		03/22/17 17:14	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	1.1	0.27	1.34		03/22/17 17:14	107-06-2	
Ethylbenzene	**1.5J**	ug/m3	3.0	0.57	1.34		03/22/17 17:14	100-41-4	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Sample: AOI6-AI-17-05 **Lab ID: 10381753003** Collected: 03/09/17 15:29 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/22/17 17:14	98-82-8	
Methyl-tert-butyl ether	**<0.41**	ug/m3	4.9	0.41	1.34		03/22/17 17:14	1634-04-4	
Naphthalene	**3.3J**	ug/m3	3.6	0.41	1.34		03/22/17 17:14	91-20-3	
Toluene	**1.7**	ug/m3	1.0	0.21	1.34		03/22/17 17:14	108-88-3	
1,2,4-Trimethylbenzene	**2.0J**	ug/m3	3.3	0.17	1.34		03/22/17 17:14	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	3.3	0.25	1.34		03/22/17 17:14	108-67-8	
Xylene (Total)	**4.5**	ug/m3	3.6	1.5	1.34		03/22/17 17:14	1330-20-7	
m&p-Xylene	**3.0**	ug/m3	2.4	1.1	1.34		03/22/17 17:14	179601-23-1	
o-Xylene	**1.5J**	ug/m3	3.0	0.47	1.34		03/22/17 17:14	95-47-6	

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

QC Batch: 464861 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10381753001, 10381753002

METHOD BLANK: 2541460 | Matrix: Air
Associated Lab Samples: 10381753001, 10381753002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/21/17 08:59	
1,2-Dibromoethane (EDB)	ug/m3	<0.77	1.6	0.77	03/21/17 08:59	
1,2-Dichloroethane	ug/m3	<0.20	0.82	0.20	03/21/17 08:59	
1,3,5-Trimethylbenzene	ug/m3	<0.18	2.5	0.18	03/21/17 08:59	
Benzene	ug/m3	<0.12	0.65	0.12	03/21/17 08:59	
Ethylbenzene	ug/m3	<0.42	2.2	0.42	03/21/17 08:59	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/21/17 08:59	
m&p-Xylene	ug/m3	<0.79	1.8	0.79	03/21/17 08:59	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/21/17 08:59	
Naphthalene	ug/m3	2.2J	2.7	0.30	03/21/17 08:59	
o-Xylene	ug/m3	<0.35	2.2	0.35	03/21/17 08:59	
Toluene	ug/m3	<0.15	0.77	0.15	03/21/17 08:59	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/21/17 08:59	

LABORATORY CONTROL SAMPLE: 2541461

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	50	48.5	97	75-136	
1,2-Dibromoethane (EDB)	ug/m3	78.1	97.9	125	75-128	
1,2-Dichloroethane	ug/m3	41.1	35.1	85	75-130	
1,3,5-Trimethylbenzene	ug/m3	50	48.9	98	75-133	
Benzene	ug/m3	32.5	27.5	85	75-129	
Ethylbenzene	ug/m3	44.1	43.4	98	75-134	
Isopropylbenzene (Cumene)	ug/m3	50	66.3	133	75-140	CH
m&p-Xylene	ug/m3	88.3	87.9	100	75-129	
Methyl-tert-butyl ether	ug/m3	91.6	72.7	79	66-148	
Naphthalene	ug/m3	53.3	53.4	100	53-150	SS
o-Xylene	ug/m3	44.1	42.8	97	75-129	
Toluene	ug/m3	38.3	38.7	101	75-129	
Xylene (Total)	ug/m3	132	131	99	72-141	

SAMPLE DUPLICATE: 2542381

Parameter	Units	10381970006 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	ND	2.2J		25	
1,2-Dibromoethane (EDB)	ug/m3	ND	<1.2		25	
1,2-Dichloroethane	ug/m3	ND	<0.31		25	
1,3,5-Trimethylbenzene	ug/m3	ND	2.1J		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

SAMPLE DUPLICATE: 2542381

Parameter	Units	10381970006 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/m3	ND	0.92J		25	
Ethylbenzene	ug/m3	ND	1.5J		25	
Isopropylbenzene (Cumene)	ug/m3	ND	<0.21		25	
m&p-Xylene	ug/m3	2.9	2.9	1	25	
Methyl-tert-butyl ether	ug/m3	ND	<0.45		25	
Naphthalene	ug/m3	ND	3.4J		25	
o-Xylene	ug/m3	ND	1.7J		25	
Toluene	ug/m3	ND	0.75J		25	
Xylene (Total)	ug/m3	4.6	4.6	0		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

QC Batch: 465254 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10381753003

METHOD BLANK: 2543655 | Matrix: Air
Associated Lab Samples: 10381753003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/22/17 14:21	
1,2-Dibromoethane (EDB)	ug/m3	<0.77	1.6	0.77	03/22/17 14:21	
1,2-Dichloroethane	ug/m3	<0.20	0.82	0.20	03/22/17 14:21	
1,3,5-Trimethylbenzene	ug/m3	<0.18	2.5	0.18	03/22/17 14:21	
Benzene	ug/m3	<0.12	0.65	0.12	03/22/17 14:21	
Ethylbenzene	ug/m3	<0.42	2.2	0.42	03/22/17 14:21	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/22/17 14:21	
m&p-Xylene	ug/m3	<0.79	1.8	0.79	03/22/17 14:21	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/22/17 14:21	
Naphthalene	ug/m3	2.6J	2.7	0.30	03/22/17 14:21	
o-Xylene	ug/m3	<0.35	2.2	0.35	03/22/17 14:21	
Toluene	ug/m3	<0.15	0.77	0.15	03/22/17 14:21	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/22/17 14:21	

LABORATORY CONTROL SAMPLE: 2543656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	50	42.3	85	70-136	
1,2-Dibromoethane (EDB)	ug/m3	78.1	85.9	110	70-130	
1,2-Dichloroethane	ug/m3	41.1	31.0	75	70-130	
1,3,5-Trimethylbenzene	ug/m3	50	43.3	87	70-133	
Benzene	ug/m3	32.5	24.2	75	70-130	
Ethylbenzene	ug/m3	44.1	38.1	86	70-134	
Isopropylbenzene (Cumene)	ug/m3	50	58.8	118	70-140	
m&p-Xylene	ug/m3	88.3	78.5	89	70-130	
Methyl-tert-butyl ether	ug/m3	91.6	68.2	74	66-148	
Naphthalene	ug/m3	53.3	47.5	89	53-150	
o-Xylene	ug/m3	44.1	37.6	85	70-130	
Toluene	ug/m3	38.3	34.6	90	70-130	
Xylene (Total)	ug/m3	132	116	88	70-141	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11109626 Evergreen PES
Pace Project No.: 10381753

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10381753001	**AOI8-AI-17-12**	TO-15	464861		
10381753002	**AOI8-AA-17-03**	TO-15	464861		
10381753003	**AOI6-AI-17-05**	TO-15	465254		

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10381753

26265

Page: 1 of 1

Section A Required Client Information:

Company: GHD
Address: 410 Eagleview Blvd Suite 110
Exton, Pennsylvania
Email To: David.Steele@ghd.com
Phone: 610-321-1800 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Steele
Copy To: Paul McMahon
Purchase Order No.:
Project Name: Evergreen PES
Project Number: 11109626

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #:

Program: UST / Superfund / Emissions / Clean Air Act / Voluntary Clean Up / Dry Clean / RCRA / Other

Location of Sampling by State

Reporting Units: ug/m³ mg/m³ PPBV PPMV Other

Report Level: II. III. IV. Other

Method:

'Section D Required Client Information

AIR SAMPLE ID
Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	'Section D Required Client Information AIR SAMPLE ID	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START END/GRAB DATE	TIME	COMPOSITE - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	PM10	3C- Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14	TO-15	TO15 Short List*	Pace Lab ID
1	AOI8-AI-17-12	6LC		3-9-17	0830	3-9-17	1433	-27	-5	0129	1055									X	001
2	AOI8-AA-17-03	6LC		3-9-17	0846	3-9-17	1650	-30	-14	0177	0278									X	002
3	AOI6-AT-17-05	6LC		3-9-17	727	3-9-17	1529	-29	-1	834	02057										003
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	3/10/17	1215	[signature]	3/10/17	1215
[signature]	3/10/17	1330	[signature]	3/14/17	1030

SAMPLE CONDITIONS

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
AMB	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

FC046Rev.01, 03Feb2010

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 26APR2016 Page 1 of 1
	Document No.: F-MN-A-106-rev.11	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: GHD

Project #: WO# : 10381753

10381753

Courier: ☑ Fed Ex ☐ UPS ☐ Speedee ☐ Client ☐ Commercial ☐ Pace ☐ Other:

Tracking Number: 7856 6984 7161; 5928; 7150; 715

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ Foam ☐ None ☐ Tin Can ☐ Other: **Temp Blank rec:** ☐ Yes ☑ No

Temp. (TO17 and TO13 samples only) (°C): **Corrected Temp (°C):** **Thermom. Used:** ☐ B88A912167504 ☐ B88A0143310098 ☐ 151401163 ☐ 151401164

Temp should be above freezing to 6°C **Correction Factor:** AMB **Date & Initials of Person Examining Contents:** CJ 3/14/17

Type of ice Received ☐ Blue ☐ Wet ☐ None

				Comments:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Media: Air Can Airbag Filter TDT Passive				11.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.

Samples Received:

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
A0I8-AI-17-12	0129	1055			
" " -03	0177	0278			
A0I6-AI-05	0834	02057			

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Nathan Boberg **Date:** 3/15/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

March 29, 2017

David Steele
GHD
410 Eagleview Blvd.
Exton, PA 19341

RE: Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Dear David Steele:
Enclosed are the analytical results for sample(s) received by the laboratory on March 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nathan Boberg
nathan.boberg@pacelabs.com
(612)607-6407
Project Manager

Enclosures

cc: Paul McMahon, GHD

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CERTIFICATIONS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: UST-078
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: MN00064
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia WW Certification #: 382
Wisconsin Certification #: 999407970
Wyoming via EPA Region 8 Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10381907001	**AOI6-AI-17-09**	Air	03/08/17 16:03	03/14/17 10:30
10381907002	**AOI6-AI-17-10**	Air	03/08/17 15:37	03/14/17 10:30
10381907003	**AOI6-AI-17-11**	Air	03/08/17 16:27	03/14/17 10:30
10381907004	**AOI6-AI-17-12**	Air	03/08/17 16:38	03/14/17 10:30
10381907005	**AOI6-AI-17-13**	Air	03/08/17 16:34	03/14/17 10:30
10381907006	**AOI6-AI-17-14**	Air	03/08/17 17:08	03/14/17 10:30
10381907007	**AOI6-AI-17-06**	Air	03/08/17 17:55	03/14/17 10:30
10381907008	**AOI6-AI-17-07R**	Air	03/09/17 16:57	03/14/17 10:30
10381907009	**AOI3-AI-17-01**	Air	03/09/17 14:56	03/14/17 10:30
10381907010	**AOI3-AI-17-02**	Air	03/09/17 15:05	03/14/17 10:30
10381907011	**AOI3-AI-17-03**	Air	03/09/17 14:58	03/14/17 10:30
10381907012	**AOI3-AI-17-04**	Air	03/09/17 15:07	03/14/17 10:30
10381907013	**AOI3-AI-17-05**	Air	03/09/17 14:46	03/14/17 10:30
10381907014	**AOI3-AI-17-06**	Air	03/09/17 15:03	03/14/17 10:30
10381907015	**AOI3-AI-17-07**	Air	03/09/17 14:48	03/14/17 10:30
10381907016	**AOI3-AI-17-08**	Air	03/09/17 16:05	03/14/17 10:30
10381907017	**AOI4-AI-17-01**	Air	03/09/17 16:40	03/14/17 10:30
10381907018	**AOI4-AA-17-01**	Air	03/09/17 16:42	03/14/17 10:30
10381907019	**AOI8-AI-17-09**	Air	03/09/17 16:10	03/14/17 10:30
10381907020	**AOI8-AI-17-10**	Air	03/09/17 16:17	03/14/17 10:30
10381907021	**AOI8-AI-17-11**	Air	03/09/17 16:42	03/14/17 10:30

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SAMPLE ANALYTE COUNT

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10381907001	**AOI6-AI-17-09**	TO-15	MLS	13
10381907003	**AOI6-AI-17-11**	TO-15	EMC	13
10381907004	**AOI6-AI-17-12**	TO-15	EMC	13
10381907005	**AOI6-AI-17-13**	TO-15	EMC	13
10381907006	**AOI6-AI-17-14**	TO-15	EMC	13
10381907007	**AOI6-AI-17-06**	TO-15	EMC	13
10381907008	**AOI6-AI-17-07R**	TO-15	EMC	13
10381907009	**AOI3-AI-17-01**	TO-15	EMC	13
10381907010	**AOI3-AI-17-02**	TO-15	EMC	13
10381907011	**AOI3-AI-17-03**	TO-15	EMC	13
10381907012	**AOI3-AI-17-04**	TO-15	EMC	13
10381907013	**AOI3-AI-17-05**	TO-15	EMC	13
10381907014	**AOI3-AI-17-06**	TO-15	EMC	13
10381907015	**AOI3-AI-17-07**	TO-15	EMC	13
10381907016	**AOI3-AI-17-08**	TO-15	EMC	13
10381907017	**AOI4-AI-17-01**	TO-15	EMC	13
10381907018	**AOI4-AA-17-01**	TO-15	EMC	13
10381907019	**AOI8-AI-17-09**	TO-15	EMC	13
10381907020	**AOI8-AI-17-10**	TO-15	EMC	13
10381907021	**AOI8-AI-17-11**	TO-15	EMC	13

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PROJECT NARRATIVE

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Date: March 29, 2017

During validation it was noted that sample ID AO16-AI-17-10 may have been contaminated and resutls cannot be included within final results.

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PROJECT NARRATIVE

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Method: **TO-15**
Description: TO15 MSV AIR
Client: GHD
Date: March 29, 2017

General Information:
20 samples were analyzed for TO-15. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

QC Batch: 464884

SS: This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

- LCS (Lab ID: 2541577)
  - Naphthalene

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

QC Batch: 465257

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2543664)
  - 1,2-Dichloroethane

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 465212

C0: Result confirmed by second analysis.

- AOI3-AI-17-08 (Lab ID: 10381907016)
  - Toluene

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI6-AI-17-09 **Lab ID: 10381907001** Collected: 03/08/17 16:03 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**6.4**	ug/m3	0.87	0.16	1.34		03/22/17 17:44	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	2.1	1.0	1.34		03/22/17 17:44	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	1.1	0.27	1.34		03/22/17 17:44	107-06-2	
Ethylbenzene	**1.5J**	ug/m3	3.0	0.57	1.34		03/22/17 17:44	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/22/17 17:44	98-82-8	
Methyl-tert-butyl ether	**<0.41**	ug/m3	4.9	0.41	1.34		03/22/17 17:44	1634-04-4	
Naphthalene	**3.5J**	ug/m3	3.6	0.41	1.34		03/22/17 17:44	91-20-3	
Toluene	**2.1**	ug/m3	1.0	0.21	1.34		03/22/17 17:44	108-88-3	
1,2,4-Trimethylbenzene	**2.1J**	ug/m3	3.3	0.17	1.34		03/22/17 17:44	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	3.3	0.25	1.34		03/22/17 17:44	108-67-8	
Xylene (Total)	**4.8**	ug/m3	3.6	1.5	1.34		03/22/17 17:44	1330-20-7	
m&p-Xylene	**3.2**	ug/m3	2.4	1.1	1.34		03/22/17 17:44	179601-23-1	
o-Xylene	**1.6J**	ug/m3	3.0	0.47	1.34		03/22/17 17:44	95-47-6	

Sample: AOI6-AI-17-11 **Lab ID: 10381907003** Collected: 03/08/17 16:27 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**8.6**	ug/m3	0.47	0.18	1.44		03/23/17 03:28	71-43-2	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	5.6	1.1	1.44		03/23/17 03:28	106-93-4	
1,2-Dichloroethane	**<0.30**	ug/m3	0.59	0.30	1.44		03/23/17 03:28	107-06-2	
Ethylbenzene	**<0.61**	ug/m3	3.2	0.61	1.44		03/23/17 03:28	100-41-4	
Isopropylbenzene (Cumene)	**<0.20**	ug/m3	3.6	0.20	1.44		03/23/17 03:28	98-82-8	
Methyl-tert-butyl ether	**<0.44**	ug/m3	5.3	0.44	1.44		03/23/17 03:28	1634-04-4	
Naphthalene	**1.9J**	ug/m3	3.8	0.44	1.44		03/23/17 03:28	91-20-3	
Toluene	**3.5**	ug/m3	1.1	0.22	1.44		03/23/17 03:28	108-88-3	
1,2,4-Trimethylbenzene	**2.5J**	ug/m3	3.6	0.18	1.44		03/23/17 03:28	95-63-6	
1,3,5-Trimethylbenzene	**<0.26**	ug/m3	3.6	0.26	1.44		03/23/17 03:28	108-67-8	
Xylene (Total)	**7.7**	ug/m3	3.8	1.6	1.44		03/23/17 03:28	1330-20-7	
m&p-Xylene	**5.2J**	ug/m3	6.4	1.1	1.44		03/23/17 03:28	179601-23-1	
o-Xylene	**2.5J**	ug/m3	3.2	0.51	1.44		03/23/17 03:28	95-47-6	

Sample: AOI6-AI-17-12 **Lab ID: 10381907004** Collected: 03/08/17 16:38 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**14.1**	ug/m3	0.58	0.22	1.8		03/23/17 03:56	71-43-2	
1,2-Dibromoethane (EDB)	**<1.4**	ug/m3	7.0	1.4	1.8		03/23/17 03:56	106-93-4	
1,2-Dichloroethane	**<0.37**	ug/m3	0.74	0.37	1.8		03/23/17 03:56	107-06-2	
Ethylbenzene	**<0.76**	ug/m3	4.0	0.76	1.8		03/23/17 03:56	100-41-4	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI6-AI-17-12 **Lab ID: 10381907004** Collected: 03/08/17 16:38 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Isopropylbenzene (Cumene)	**<0.25**	ug/m3	4.5	0.25	1.8		03/23/17 03:56	98-82-8	
Methyl-tert-butyl ether	**<0.55**	ug/m3	6.6	0.55	1.8		03/23/17 03:56	1634-04-4	
Naphthalene	**1.0J**	ug/m3	4.8	0.55	1.8		03/23/17 03:56	91-20-3	
Toluene	**4.1**	ug/m3	1.4	0.28	1.8		03/23/17 03:56	108-88-3	
1,2,4-Trimethylbenzene	**3.0J**	ug/m3	4.5	0.22	1.8		03/23/17 03:56	95-63-6	
1,3,5-Trimethylbenzene	**<0.33**	ug/m3	4.5	0.33	1.8		03/23/17 03:56	108-67-8	
Xylene (Total)	**6.3**	ug/m3	4.8	2.0	1.8		03/23/17 03:56	1330-20-7	
m&p-Xylene	**6.3J**	ug/m3	7.9	1.4	1.8		03/23/17 03:56	179601-23-1	
o-Xylene	**<0.63**	ug/m3	4.0	0.63	1.8		03/23/17 03:56	95-47-6	

Sample: AOI6-AI-17-13 **Lab ID: 10381907005** Collected: 03/08/17 16:34 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**15.8**	ug/m3	0.44	0.16	1.34		03/23/17 04:26	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	5.2	1.0	1.34		03/23/17 04:26	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/23/17 04:26	107-06-2	
Ethylbenzene	**<0.57**	ug/m3	3.0	0.57	1.34		03/23/17 04:26	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/23/17 04:26	98-82-8	
Methyl-tert-butyl ether	**<0.41**	ug/m3	4.9	0.41	1.34		03/23/17 04:26	1634-04-4	
Naphthalene	**5.9**	ug/m3	3.6	0.41	1.34		03/23/17 04:26	91-20-3	
Toluene	**5.3**	ug/m3	1.0	0.21	1.34		03/23/17 04:26	108-88-3	
1,2,4-Trimethylbenzene	**2.4J**	ug/m3	3.3	0.17	1.34		03/23/17 04:26	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	3.3	0.25	1.34		03/23/17 04:26	108-67-8	
Xylene (Total)	**7.9**	ug/m3	3.6	1.5	1.34		03/23/17 04:26	1330-20-7	
m&p-Xylene	**5.4J**	ug/m3	5.9	1.1	1.34		03/23/17 04:26	179601-23-1	
o-Xylene	**2.5J**	ug/m3	3.0	0.47	1.34		03/23/17 04:26	95-47-6	

Sample: AOI6-AI-17-14 **Lab ID: 10381907006** Collected: 03/08/17 17:08 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**5.9**	ug/m3	0.44	0.16	1.34		03/23/17 04:55	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	5.2	1.0	1.34		03/23/17 04:55	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/23/17 04:55	107-06-2	
Ethylbenzene	**<0.57**	ug/m3	3.0	0.57	1.34		03/23/17 04:55	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/23/17 04:55	98-82-8	
Methyl-tert-butyl ether	**<0.41**	ug/m3	4.9	0.41	1.34		03/23/17 04:55	1634-04-4	
Naphthalene	**0.74J**	ug/m3	3.6	0.41	1.34		03/23/17 04:55	91-20-3	
Toluene	**3.6**	ug/m3	1.0	0.21	1.34		03/23/17 04:55	108-88-3	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI6-AI-17-14 **Lab ID: 10381907006** Collected: 03/08/17 17:08 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
1,2,4-Trimethylbenzene	**2.6J**	ug/m3	3.3	0.17	1.34		03/23/17 04:55	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	3.3	0.25	1.34		03/23/17 04:55	108-67-8	
Xylene (Total)	**7.8**	ug/m3	3.6	1.5	1.34		03/23/17 04:55	1330-20-7	
m&p-Xylene	**5.3J**	ug/m3	5.9	1.1	1.34		03/23/17 04:55	179601-23-1	
o-Xylene	**2.5J**	ug/m3	3.0	0.47	1.34		03/23/17 04:55	95-47-6	

Sample: AOI6-AI-17-06 **Lab ID: 10381907007** Collected: 03/08/17 17:55 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**2.2**	ug/m3	0.44	0.16	1.34		03/23/17 05:25	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	5.2	1.0	1.34		03/23/17 05:25	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/23/17 05:25	107-06-2	
Ethylbenzene	**2.2J**	ug/m3	3.0	0.57	1.34		03/23/17 05:25	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/23/17 05:25	98-82-8	
Methyl-tert-butyl ether	**<0.41**	ug/m3	4.9	0.41	1.34		03/23/17 05:25	1634-04-4	
Naphthalene	**0.52J**	ug/m3	3.6	0.41	1.34		03/23/17 05:25	91-20-3	
Toluene	**10.4**	ug/m3	1.0	0.21	1.34		03/23/17 05:25	108-88-3	
1,2,4-Trimethylbenzene	**2.8J**	ug/m3	3.3	0.17	1.34		03/23/17 05:25	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	3.3	0.25	1.34		03/23/17 05:25	108-67-8	
Xylene (Total)	**8.4**	ug/m3	3.6	1.5	1.34		03/23/17 05:25	1330-20-7	
m&p-Xylene	**5.7J**	ug/m3	5.9	1.1	1.34		03/23/17 05:25	179601-23-1	
o-Xylene	**2.7J**	ug/m3	3.0	0.47	1.34		03/23/17 05:25	95-47-6	

Sample: AOI6-AI-17-07R **Lab ID: 10381907008** Collected: 03/09/17 16:57 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**8.2**	ug/m3	0.50	0.19	1.55		03/21/17 15:31	71-43-2	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.4	1.2	1.55		03/21/17 15:31	106-93-4	
1,2-Dichloroethane	ND	ug/m3	0.64	0.32	1.55		03/21/17 15:31	107-06-2	
Ethylbenzene	**1.7**	ug/m3	1.4	0.66	1.55		03/21/17 15:31	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/m3	3.9	0.21	1.55		03/21/17 15:31	98-82-8	
Methyl-tert-butyl ether	ND	ug/m3	5.7	0.47	1.55		03/21/17 15:31	1634-04-4	
Naphthalene	ND	ug/m3	4.1	0.47	1.55		03/21/17 15:31	91-20-3	
Toluene	**7.3**	ug/m3	1.2	0.24	1.55		03/21/17 15:31	108-88-3	
1,2,4-Trimethylbenzene	**4.4**	ug/m3	1.5	0.19	1.55		03/21/17 15:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.5	0.28	1.55		03/21/17 15:31	108-67-8	
Xylene (Total)	**8.8**	ug/m3	4.1	1.8	1.55		03/21/17 15:31	1330-20-7	
m&p-Xylene	**6.4**	ug/m3	2.7	1.2	1.55		03/21/17 15:31	179601-23-1	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI6-AI-17-07R **Lab ID: 10381907008** Collected: 03/09/17 16:57 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
o-Xylene	**2.4**	ug/m3	1.4	0.54	1.55		03/21/17 15:31	95-47-6	

Sample: AOI3-AI-17-01 **Lab ID: 10381907009** Collected: 03/09/17 14:56 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**3.7**	ug/m3	0.45	0.17	1.39		03/23/17 14:13	71-43-2	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	5.4	1.1	1.39		03/23/17 14:13	106-93-4	
1,2-Dichloroethane	**<0.28**	ug/m3	0.57	0.28	1.39		03/23/17 14:13	107-06-2	
Ethylbenzene	**2.3J**	ug/m3	3.1	0.59	1.39		03/23/17 14:13	100-41-4	
Isopropylbenzene (Cumene)	**<0.19**	ug/m3	3.5	0.19	1.39		03/23/17 14:13	98-82-8	
Methyl-tert-butyl ether	**0.48J**	ug/m3	5.1	0.42	1.39		03/23/17 14:13	1634-04-4	
Naphthalene	**1.9J**	ug/m3	3.7	0.42	1.39		03/23/17 14:13	91-20-3	
Toluene	**5.2**	ug/m3	1.1	0.21	1.39		03/23/17 14:13	108-88-3	
1,2,4-Trimethylbenzene	**2.6J**	ug/m3	3.5	0.17	1.39		03/23/17 14:13	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	3.5	0.25	1.39		03/23/17 14:13	108-67-8	
Xylene (Total)	**8.7**	ug/m3	3.7	1.6	1.39		03/23/17 14:13	1330-20-7	
m&p-Xylene	**6.0J**	ug/m3	6.1	1.1	1.39		03/23/17 14:13	179601-23-1	
o-Xylene	**2.7J**	ug/m3	3.1	0.49	1.39		03/23/17 14:13	95-47-6	

Sample: AOI3-AI-17-02 **Lab ID: 10381907010** Collected: 03/09/17 15:05 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**7.5**	ug/m3	0.44	0.16	1.34		03/23/17 14:42	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	5.2	1.0	1.34		03/23/17 14:42	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/23/17 14:42	107-06-2	
Ethylbenzene	**3.2**	ug/m3	3.0	0.57	1.34		03/23/17 14:42	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/23/17 14:42	98-82-8	
Methyl-tert-butyl ether	**0.57J**	ug/m3	4.9	0.41	1.34		03/23/17 14:42	1634-04-4	
Naphthalene	**1.4J**	ug/m3	3.6	0.41	1.34		03/23/17 14:42	91-20-3	
Toluene	**21.9**	ug/m3	1.0	0.21	1.34		03/23/17 14:42	108-88-3	
1,2,4-Trimethylbenzene	**3.8**	ug/m3	3.3	0.17	1.34		03/23/17 14:42	95-63-6	
1,3,5-Trimethylbenzene	**3.0J**	ug/m3	3.3	0.25	1.34		03/23/17 14:42	108-67-8	
Xylene (Total)	**14.5**	ug/m3	3.6	1.5	1.34		03/23/17 14:42	1330-20-7	
m&p-Xylene	**10.4**	ug/m3	5.9	1.1	1.34		03/23/17 14:42	179601-23-1	
o-Xylene	**4.1**	ug/m3	3.0	0.47	1.34		03/23/17 14:42	95-47-6	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI3-AI-17-03 **Lab ID: 10381907011** Collected: 03/09/17 14:58 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**7.1**	ug/m3	0.48	0.18	1.49		03/23/17 15:10	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	5.8	1.2	1.49		03/23/17 15:10	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/23/17 15:10	107-06-2	
Ethylbenzene	**3.3J**	ug/m3	3.3	0.63	1.49		03/23/17 15:10	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.7	0.21	1.49		03/23/17 15:10	98-82-8	
Methyl-tert-butyl ether	**0.47J**	ug/m3	5.5	0.45	1.49		03/23/17 15:10	1634-04-4	
Naphthalene	**1.4J**	ug/m3	4.0	0.45	1.49		03/23/17 15:10	91-20-3	
Toluene	**15.2**	ug/m3	1.1	0.23	1.49		03/23/17 15:10	108-88-3	
1,2,4-Trimethylbenzene	**4.0**	ug/m3	3.7	0.19	1.49		03/23/17 15:10	95-63-6	
1,3,5-Trimethylbenzene	**3.3J**	ug/m3	3.7	0.27	1.49		03/23/17 15:10	108-67-8	
Xylene (Total)	**14.5**	ug/m3	3.9	1.7	1.49		03/23/17 15:10	1330-20-7	
m&p-Xylene	**10.3**	ug/m3	6.6	1.2	1.49		03/23/17 15:10	179601-23-1	
o-Xylene	**4.2**	ug/m3	3.3	0.52	1.49		03/23/17 15:10	95-47-6	

Sample: AOI3-AI-17-04 **Lab ID: 10381907012** Collected: 03/09/17 15:07 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**6.1**	ug/m3	0.44	0.16	1.34		03/23/17 15:37	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	5.2	1.0	1.34		03/23/17 15:37	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/23/17 15:37	107-06-2	
Ethylbenzene	**3.1**	ug/m3	3.0	0.57	1.34		03/23/17 15:37	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/23/17 15:37	98-82-8	
Methyl-tert-butyl ether	**0.56J**	ug/m3	4.9	0.41	1.34		03/23/17 15:37	1634-04-4	
Naphthalene	**1.3J**	ug/m3	3.6	0.41	1.34		03/23/17 15:37	91-20-3	
Toluene	**18.3**	ug/m3	1.0	0.21	1.34		03/23/17 15:37	108-88-3	
1,2,4-Trimethylbenzene	**3.5**	ug/m3	3.3	0.17	1.34		03/23/17 15:37	95-63-6	
1,3,5-Trimethylbenzene	**2.9J**	ug/m3	3.3	0.25	1.34		03/23/17 15:37	108-67-8	
Xylene (Total)	**12.9**	ug/m3	3.6	1.5	1.34		03/23/17 15:37	1330-20-7	
m&p-Xylene	**9.1**	ug/m3	5.9	1.1	1.34		03/23/17 15:37	179601-23-1	
o-Xylene	**3.8**	ug/m3	3.0	0.47	1.34		03/23/17 15:37	95-47-6	

Sample: AOI3-AI-17-05 **Lab ID: 10381907013** Collected: 03/09/17 14:46 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**6.3**	ug/m3	0.45	0.17	1.39		03/23/17 16:05	71-43-2	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	5.4	1.1	1.39		03/23/17 16:05	106-93-4	
1,2-Dichloroethane	**<0.28**	ug/m3	0.57	0.28	1.39		03/23/17 16:05	107-06-2	
Ethylbenzene	**3.0J**	ug/m3	3.1	0.59	1.39		03/23/17 16:05	100-41-4	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI3-AI-17-05 **Lab ID: 10381907013** Collected: 03/09/17 14:46 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Isopropylbenzene (Cumene)	**<0.19**	ug/m3	3.5	0.19	1.39		03/23/17 16:05	98-82-8	
Methyl-tert-butyl ether	**0.65J**	ug/m3	5.1	0.42	1.39		03/23/17 16:05	1634-04-4	
Naphthalene	**1.4J**	ug/m3	3.7	0.42	1.39		03/23/17 16:05	91-20-3	
Toluene	**18.9**	ug/m3	1.1	0.21	1.39		03/23/17 16:05	108-88-3	
1,2,4-Trimethylbenzene	**3.7**	ug/m3	3.5	0.17	1.39		03/23/17 16:05	95-63-6	
1,3,5-Trimethylbenzene	**3.0J**	ug/m3	3.5	0.25	1.39		03/23/17 16:05	108-67-8	
Xylene (Total)	**13.1**	ug/m3	3.7	1.6	1.39		03/23/17 16:05	1330-20-7	
m&p-Xylene	**9.2**	ug/m3	6.1	1.1	1.39		03/23/17 16:05	179601-23-1	
o-Xylene	**3.8**	ug/m3	3.1	0.49	1.39		03/23/17 16:05	95-47-6	

Sample: AOI3-AI-17-06 **Lab ID: 10381907014** Collected: 03/09/17 15:03 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**5.7**	ug/m3	0.44	0.16	1.34		03/23/17 16:33	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	5.2	1.0	1.34		03/23/17 16:33	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/23/17 16:33	107-06-2	
Ethylbenzene	**2.8J**	ug/m3	3.0	0.57	1.34		03/23/17 16:33	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/23/17 16:33	98-82-8	
Methyl-tert-butyl ether	**0.68J**	ug/m3	4.9	0.41	1.34		03/23/17 16:33	1634-04-4	
Naphthalene	**0.92J**	ug/m3	3.6	0.41	1.34		03/23/17 16:33	91-20-3	
Toluene	**17.9**	ug/m3	1.0	0.21	1.34		03/23/17 16:33	108-88-3	
1,2,4-Trimethylbenzene	**2.8J**	ug/m3	3.3	0.17	1.34		03/23/17 16:33	95-63-6	
1,3,5-Trimethylbenzene	**2.7J**	ug/m3	3.3	0.25	1.34		03/23/17 16:33	108-67-8	
Xylene (Total)	**11.8**	ug/m3	3.6	1.5	1.34		03/23/17 16:33	1330-20-7	
m&p-Xylene	**8.4**	ug/m3	5.9	1.1	1.34		03/23/17 16:33	179601-23-1	
o-Xylene	**3.4**	ug/m3	3.0	0.47	1.34		03/23/17 16:33	95-47-6	

Sample: AOI3-AI-17-07 **Lab ID: 10381907015** Collected: 03/09/17 14:48 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**2.2**	ug/m3	0.50	0.19	1.55		03/21/17 16:26	71-43-2	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.4	1.2	1.55		03/21/17 16:26	106-93-4	
1,2-Dichloroethane	ND	ug/m3	0.64	0.32	1.55		03/21/17 16:26	107-06-2	
Ethylbenzene	ND	ug/m3	1.4	0.66	1.55		03/21/17 16:26	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/m3	3.9	0.21	1.55		03/21/17 16:26	98-82-8	
Methyl-tert-butyl ether	ND	ug/m3	5.7	0.47	1.55		03/21/17 16:26	1634-04-4	
Naphthalene	ND	ug/m3	4.1	0.47	1.55		03/21/17 16:26	91-20-3	
Toluene	**5.9**	ug/m3	1.2	0.24	1.55		03/21/17 16:26	108-88-3	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI3-AI-17-07 **Lab ID: 10381907015** Collected: 03/09/17 14:48 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
1,2,4-Trimethylbenzene	**1.9**	ug/m3	1.5	0.19	1.55		03/21/17 16:26	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.5	0.28	1.55		03/21/17 16:26	108-67-8	
Xylene (Total)	**5.5**	ug/m3	4.1	1.8	1.55		03/21/17 16:26	1330-20-7	
m&p-Xylene	**4.1**	ug/m3	2.7	1.2	1.55		03/21/17 16:26	179601-23-1	
o-Xylene	**1.4**	ug/m3	1.4	0.54	1.55		03/21/17 16:26	95-47-6	

Sample: AOI3-AI-17-08 **Lab ID: 10381907016** Collected: 03/09/17 16:05 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.6**	ug/m3	0.68	0.25	2.08		03/23/17 00:14	71-43-2	
1,2-Dibromoethane (EDB)	**<1.6**	ug/m3	8.1	1.6	2.08		03/23/17 00:14	106-93-4	
1,2-Dichloroethane	**<0.43**	ug/m3	0.85	0.43	2.08		03/23/17 00:14	107-06-2	
Ethylbenzene	**<0.88**	ug/m3	4.6	0.88	2.08		03/23/17 00:14	100-41-4	
Isopropylbenzene (Cumene)	**<0.29**	ug/m3	5.2	0.29	2.08		03/23/17 00:14	98-82-8	
Methyl-tert-butyl ether	**<0.63**	ug/m3	7.6	0.63	2.08		03/23/17 00:14	1634-04-4	
Naphthalene	**1.2J**	ug/m3	5.5	0.63	2.08		03/23/17 00:14	91-20-3	
Toluene	**5.1**	ug/m3	1.6	0.32	2.08		03/23/17 00:14	108-88-3	C0
1,2,4-Trimethylbenzene	**3.6J**	ug/m3	5.2	0.26	2.08		03/23/17 00:14	95-63-6	
1,3,5-Trimethylbenzene	**<0.38**	ug/m3	5.2	0.38	2.08		03/23/17 00:14	108-67-8	
Xylene (Total)	**7.2**	ug/m3	5.5	2.4	2.08		03/23/17 00:14	1330-20-7	
m&p-Xylene	**7.2J**	ug/m3	9.2	1.6	2.08		03/23/17 00:14	179601-23-1	
o-Xylene	**<0.73**	ug/m3	4.6	0.73	2.08		03/23/17 00:14	95-47-6	

Sample: AOI4-AI-17-01 **Lab ID: 10381907017** Collected: 03/09/17 16:40 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**3.0**	ug/m3	0.50	0.19	1.55		03/23/17 00:42	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	6.1	1.2	1.55		03/23/17 00:42	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/23/17 00:42	107-06-2	
Ethylbenzene	**2.4J**	ug/m3	3.4	0.66	1.55		03/23/17 00:42	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/23/17 00:42	98-82-8	
Methyl-tert-butyl ether	**<0.47**	ug/m3	5.7	0.47	1.55		03/23/17 00:42	1634-04-4	
Naphthalene	**0.97J**	ug/m3	4.1	0.47	1.55		03/23/17 00:42	91-20-3	
Toluene	**3.6**	ug/m3	1.2	0.24	1.55		03/23/17 00:42	108-88-3	
1,2,4-Trimethylbenzene	**3.5J**	ug/m3	3.9	0.19	1.55		03/23/17 00:42	95-63-6	
1,3,5-Trimethylbenzene	**<0.28**	ug/m3	3.9	0.28	1.55		03/23/17 00:42	108-67-8	
Xylene (Total)	**9.2**	ug/m3	4.1	1.8	1.55		03/23/17 00:42	1330-20-7	
m&p-Xylene	**6.2J**	ug/m3	6.8	1.2	1.55		03/23/17 00:42	179601-23-1	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI4-AI-17-01 **Lab ID: 10381907017** Collected: 03/09/17 16:40 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
o-Xylene	**3.0J**	ug/m3	3.4	0.54	1.55		03/23/17 00:42	95-47-6	

Sample: AOI4-AA-17-01 **Lab ID: 10381907018** Collected: 03/09/17 16:42 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**2.4**	ug/m3	0.50	0.19	1.55		03/23/17 01:11	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	6.1	1.2	1.55		03/23/17 01:11	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/23/17 01:11	107-06-2	
Ethylbenzene	**<0.66**	ug/m3	3.4	0.66	1.55		03/23/17 01:11	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/23/17 01:11	98-82-8	
Methyl-tert-butyl ether	**<0.47**	ug/m3	5.7	0.47	1.55		03/23/17 01:11	1634-04-4	
Naphthalene	**0.63J**	ug/m3	4.1	0.47	1.55		03/23/17 01:11	91-20-3	
Toluene	**3.1**	ug/m3	1.2	0.24	1.55		03/23/17 01:11	108-88-3	
1,2,4-Trimethylbenzene	**2.7J**	ug/m3	3.9	0.19	1.55		03/23/17 01:11	95-63-6	
1,3,5-Trimethylbenzene	**<0.28**	ug/m3	3.9	0.28	1.55		03/23/17 01:11	108-67-8	
Xylene (Total)	**5.4**	ug/m3	4.1	1.8	1.55		03/23/17 01:11	1330-20-7	
m&p-Xylene	**5.4J**	ug/m3	6.8	1.2	1.55		03/23/17 01:11	179601-23-1	
o-Xylene	**<0.54**	ug/m3	3.4	0.54	1.55		03/23/17 01:11	95-47-6	

Sample: AOI8-AI-17-09 **Lab ID: 10381907019** Collected: 03/09/17 16:10 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**4.7**	ug/m3	0.45	0.17	1.39		03/23/17 17:01	71-43-2	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	5.4	1.1	1.39		03/23/17 17:01	106-93-4	
1,2-Dichloroethane	**<0.28**	ug/m3	0.57	0.28	1.39		03/23/17 17:01	107-06-2	
Ethylbenzene	**2.7J**	ug/m3	3.1	0.59	1.39		03/23/17 17:01	100-41-4	
Isopropylbenzene (Cumene)	**<0.19**	ug/m3	3.5	0.19	1.39		03/23/17 17:01	98-82-8	
Methyl-tert-butyl ether	**0.46J**	ug/m3	5.1	0.42	1.39		03/23/17 17:01	1634-04-4	
Naphthalene	**1.7J**	ug/m3	3.7	0.42	1.39		03/23/17 17:01	91-20-3	
Toluene	**9.9**	ug/m3	1.1	0.21	1.39		03/23/17 17:01	108-88-3	
1,2,4-Trimethylbenzene	**3.2J**	ug/m3	3.5	0.17	1.39		03/23/17 17:01	95-63-6	
1,3,5-Trimethylbenzene	**2.8J**	ug/m3	3.5	0.25	1.39		03/23/17 17:01	108-67-8	
Xylene (Total)	**11.2**	ug/m3	3.7	1.6	1.39		03/23/17 17:01	1330-20-7	
m&p-Xylene	**7.7**	ug/m3	6.1	1.1	1.39		03/23/17 17:01	179601-23-1	
o-Xylene	**3.4**	ug/m3	3.1	0.49	1.39		03/23/17 17:01	95-47-6	

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ANALYTICAL RESULTS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Sample: AOI8-AI-17-10 **Lab ID: 10381907020** Collected: 03/09/17 16:17 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.60**	ug/m3	0.48	0.18	1.49		03/23/17 01:39	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	5.8	1.2	1.49		03/23/17 01:39	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/23/17 01:39	107-06-2	
Ethylbenzene	**<0.63**	ug/m3	3.3	0.63	1.49		03/23/17 01:39	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.7	0.21	1.49		03/23/17 01:39	98-82-8	
Methyl-tert-butyl ether	**<0.45**	ug/m3	5.5	0.45	1.49		03/23/17 01:39	1634-04-4	
Naphthalene	**0.79J**	ug/m3	4.0	0.45	1.49		03/23/17 01:39	91-20-3	
Toluene	**2.0**	ug/m3	1.1	0.23	1.49		03/23/17 01:39	108-88-3	
1,2,4-Trimethylbenzene	**2.8J**	ug/m3	3.7	0.19	1.49		03/23/17 01:39	95-63-6	
1,3,5-Trimethylbenzene	**<0.27**	ug/m3	3.7	0.27	1.49		03/23/17 01:39	108-67-8	
Xylene (Total)	**5.0**	ug/m3	3.9	1.7	1.49		03/23/17 01:39	1330-20-7	
m&p-Xylene	**5.0J**	ug/m3	6.6	1.2	1.49		03/23/17 01:39	179601-23-1	
o-Xylene	**<0.52**	ug/m3	3.3	0.52	1.49		03/23/17 01:39	95-47-6	

Sample: AOI8-AI-17-11 **Lab ID: 10381907021** Collected: 03/09/17 16:42 Received: 03/14/17 10:30 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.60**	ug/m3	0.48	0.18	1.49		03/23/17 02:08	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	5.8	1.2	1.49		03/23/17 02:08	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/23/17 02:08	107-06-2	
Ethylbenzene	**<0.63**	ug/m3	3.3	0.63	1.49		03/23/17 02:08	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.7	0.21	1.49		03/23/17 02:08	98-82-8	
Methyl-tert-butyl ether	**<0.45**	ug/m3	5.5	0.45	1.49		03/23/17 02:08	1634-04-4	
Naphthalene	**<0.45**	ug/m3	4.0	0.45	1.49		03/23/17 02:08	91-20-3	
Toluene	**2.2**	ug/m3	1.1	0.23	1.49		03/23/17 02:08	108-88-3	
1,2,4-Trimethylbenzene	**2.4J**	ug/m3	3.7	0.19	1.49		03/23/17 02:08	95-63-6	
1,3,5-Trimethylbenzene	**<0.27**	ug/m3	3.7	0.27	1.49		03/23/17 02:08	108-67-8	
Xylene (Total)	**<1.7**	ug/m3	3.9	1.7	1.49		03/23/17 02:08	1330-20-7	
m&p-Xylene	**<1.2**	ug/m3	6.6	1.2	1.49		03/23/17 02:08	179601-23-1	
o-Xylene	**<0.52**	ug/m3	3.3	0.52	1.49		03/23/17 02:08	95-47-6	

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QUALITY CONTROL DATA

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

QC Batch: 464884 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10381907008, 10381907015

METHOD BLANK: 2541576 | Matrix: Air
Associated Lab Samples: 10381907008, 10381907015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	0.12	03/21/17 09:38	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	0.77	03/21/17 09:38	
1,2-Dichloroethane	ug/m3	ND	0.41	0.20	03/21/17 09:38	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	0.18	03/21/17 09:38	
Benzene	ug/m3	ND	0.32	0.12	03/21/17 09:38	
Ethylbenzene	ug/m3	ND	0.88	0.42	03/21/17 09:38	
Isopropylbenzene (Cumene)	ug/m3	ND	2.5	0.14	03/21/17 09:38	
m&p-Xylene	ug/m3	ND	1.8	0.79	03/21/17 09:38	
Methyl-tert-butyl ether	ug/m3	ND	3.7	0.30	03/21/17 09:38	
Naphthalene	ug/m3	ND	2.7	0.30	03/21/17 09:38	
o-Xylene	ug/m3	ND	0.88	0.35	03/21/17 09:38	
Toluene	ug/m3	ND	0.77	0.15	03/21/17 09:38	
Xylene (Total)	ug/m3	ND	2.6	1.1	03/21/17 09:38	

LABORATORY CONTROL SAMPLE: 2541577

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	50	60.4	121	75-136	
1,2-Dibromoethane (EDB)	ug/m3	78.1	92.6	119	75-128	
1,2-Dichloroethane	ug/m3	41.1	41.6	101	75-130	
1,3,5-Trimethylbenzene	ug/m3	50	60.3	121	75-133	
Benzene	ug/m3	32.5	34.6	107	75-129	
Ethylbenzene	ug/m3	44.1	53.5	121	75-134	
Isopropylbenzene (Cumene)	ug/m3	50	57.6	115	75-140	
m&p-Xylene	ug/m3	88.3	104	118	75-129	
Methyl-tert-butyl ether	ug/m3	91.6	96.6	105	66-148	
Naphthalene	ug/m3	53.3	45.3	85	53-150	SS
o-Xylene	ug/m3	44.1	50.5	114	75-129	
Toluene	ug/m3	38.3	43.2	113	75-129	
Xylene (Total)	ug/m3	132	154	117	72-141	

SAMPLE DUPLICATE: 2542457

Parameter	Units	10381907008 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	4.4	4.4	0	25	
1,2-Dibromoethane (EDB)	ug/m3	ND	ND		25	
1,2-Dichloroethane	ug/m3	ND	ND		25	
1,3,5-Trimethylbenzene	ug/m3	ND	ND		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

SAMPLE DUPLICATE: 2542457

Parameter	Units	10381907008 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/m3	8.2	8.5	4	25	
Ethylbenzene	ug/m3	1.7	1.7	1	25	
Isopropylbenzene (Cumene)	ug/m3	ND	ND		25	
m&p-Xylene	ug/m3	6.4	6.3	2	25	
Methyl-tert-butyl ether	ug/m3	ND	ND		25	
Naphthalene	ug/m3	ND	ND		25	
o-Xylene	ug/m3	2.4	2.5	5	25	
Toluene	ug/m3	7.3	7.5	3	25	
Xylene (Total)	ug/m3	8.8	8.8	0		

SAMPLE DUPLICATE: 2542458

Parameter	Units	10381907015 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	1.9	1.7	11	25	
1,2-Dibromoethane (EDB)	ug/m3	ND	ND		25	
1,2-Dichloroethane	ug/m3	ND	ND		25	
1,3,5-Trimethylbenzene	ug/m3	ND	.72J		25	
Benzene	ug/m3	2.2	2.2	3	25	
Ethylbenzene	ug/m3	ND	1J		25	
Isopropylbenzene (Cumene)	ug/m3	ND	ND		25	
m&p-Xylene	ug/m3	4.1	3.9	5	25	
Methyl-tert-butyl ether	ug/m3	ND	ND		25	
Naphthalene	ug/m3	ND	ND		25	
o-Xylene	ug/m3	1.4	ND		25	
Toluene	ug/m3	5.9	5.9	1	25	
Xylene (Total)	ug/m3	5.5	3.9J			

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QUALITY CONTROL DATA

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

QC Batch: 465212 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10381907003, 10381907004, 10381907005, 10381907006, 10381907007, 10381907016, 10381907017, 10381907018, 10381907020, 10381907021

METHOD BLANK: 2543547 | Matrix: Air
Associated Lab Samples: 10381907003, 10381907004, 10381907005, 10381907006, 10381907007, 10381907016, 10381907017, 10381907018, 10381907020, 10381907021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/22/17 20:54	
1,2-Dibromoethane (EDB)	ug/m3	<0.77	3.9	0.77	03/22/17 20:54	
1,2-Dichloroethane	ug/m3	<0.20	0.41	0.20	03/22/17 20:54	
1,3,5-Trimethylbenzene	ug/m3	<0.18	2.5	0.18	03/22/17 20:54	
Benzene	ug/m3	<0.12	0.32	0.12	03/22/17 20:54	
Ethylbenzene	ug/m3	<0.42	2.2	0.42	03/22/17 20:54	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/22/17 20:54	
m&p-Xylene	ug/m3	<0.79	4.4	0.79	03/22/17 20:54	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/22/17 20:54	
Naphthalene	ug/m3	<0.30	2.7	0.30	03/22/17 20:54	
o-Xylene	ug/m3	<0.35	2.2	0.35	03/22/17 20:54	
Toluene	ug/m3	<0.15	0.77	0.15	03/22/17 20:54	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/22/17 20:54	

LABORATORY CONTROL SAMPLE: 2543548

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	51.5	35.9	70	70-136	
1,2-Dibromoethane (EDB)	ug/m3	83.6	60.9	73	70-130	
1,2-Dichloroethane	ug/m3	44	40.9	93	70-130	
1,3,5-Trimethylbenzene	ug/m3	51.5	35.8	70	70-133	
Benzene	ug/m3	34.7	32.5	94	70-130	
Ethylbenzene	ug/m3	47.7	34.0	71	70-134	
Isopropylbenzene (Cumene)	ug/m3	51.5	36.8	71	70-140	
m&p-Xylene	ug/m3	47.7	35.7	75	70-130	
Methyl-tert-butyl ether	ug/m3	38.8	38.9	100	66-148	
Naphthalene	ug/m3	56	35.1	63	53-150	
o-Xylene	ug/m3	47.2	33.1	70	70-130	
Toluene	ug/m3	41.4	32.9	80	70-130	
Xylene (Total)	ug/m3	94.9	68.8	72	70-141	

SAMPLE DUPLICATE: 2543549

Parameter	Units	10382287001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	3.1J	3.2J		25	
1,2-Dibromoethane (EDB)	ug/m3	<1.5	<1.5		25	
1,2-Dichloroethane	ug/m3	<0.39	<0.39		25	

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REPORT OF LABORATORY ANALYSIS

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(612)607-1700

QUALITY CONTROL DATA

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

SAMPLE DUPLICATE: 2543549

Parameter	Units	10382287001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,3,5-Trimethylbenzene	ug/m3	<0.34	<0.34		25	
Benzene	ug/m3	19.4	18.8	3	25	
Ethylbenzene	ug/m3	5.2	5.1	2	25	
Isopropylbenzene (Cumene)	ug/m3	<0.26	<0.26		25	
m&p-Xylene	ug/m3	19.9	19.8	1	25	
Methyl-tert-butyl ether	ug/m3	<0.57	<0.57		25	
Naphthalene	ug/m3	1.4J	<0.57		25	
o-Xylene	ug/m3	10.5	10.3	2	25	
Toluene	ug/m3	3.1	3.2	1	25	
Xylene (Total)	ug/m3	30.4	30.1	1		

SAMPLE DUPLICATE: 2543550

Parameter	Units	10382287002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	2.6J	2.6J		25	
1,2-Dibromoethane (EDB)	ug/m3	<1.2	<1.2		25	
1,2-Dichloroethane	ug/m3	<0.31	<0.31		25	
1,3,5-Trimethylbenzene	ug/m3	<0.27	<0.27		25	
Benzene	ug/m3	7.0	7.4	5	25	
Ethylbenzene	ug/m3	2.4J	2.5J		25	
Isopropylbenzene (Cumene)	ug/m3	<0.21	<0.21		25	
m&p-Xylene	ug/m3	6.2J	6.3J		25	
Methyl-tert-butyl ether	ug/m3	<0.45	<0.45		25	
Naphthalene	ug/m3	0.78J	<0.45		25	
o-Xylene	ug/m3	2.9J	2.8J		25	
Toluene	ug/m3	4.1	4.3	5	25	
Xylene (Total)	ug/m3	9.0	9.2	1		

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QUALITY CONTROL DATA

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

QC Batch: 465254
QC Batch Method: TO-15
Analysis Method: TO-15
Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10381907001

METHOD BLANK: 2543655
Matrix: Air
Associated Lab Samples: 10381907001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/22/17 14:21	
1,2-Dibromoethane (EDB)	ug/m3	<0.77	1.6	0.77	03/22/17 14:21	
1,2-Dichloroethane	ug/m3	<0.20	0.82	0.20	03/22/17 14:21	
1,3,5-Trimethylbenzene	ug/m3	<0.18	2.5	0.18	03/22/17 14:21	
Benzene	ug/m3	<0.12	0.65	0.12	03/22/17 14:21	
Ethylbenzene	ug/m3	<0.42	2.2	0.42	03/22/17 14:21	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/22/17 14:21	
m&p-Xylene	ug/m3	<0.79	1.8	0.79	03/22/17 14:21	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/22/17 14:21	
Naphthalene	ug/m3	2.6J	2.7	0.30	03/22/17 14:21	
o-Xylene	ug/m3	<0.35	2.2	0.35	03/22/17 14:21	
Toluene	ug/m3	<0.15	0.77	0.15	03/22/17 14:21	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/22/17 14:21	

LABORATORY CONTROL SAMPLE: 2543656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	50	42.3	85	70-136	
1,2-Dibromoethane (EDB)	ug/m3	78.1	85.9	110	70-130	
1,2-Dichloroethane	ug/m3	41.1	31.0	75	70-130	
1,3,5-Trimethylbenzene	ug/m3	50	43.3	87	70-133	
Benzene	ug/m3	32.5	24.2	75	70-130	
Ethylbenzene	ug/m3	44.1	38.1	86	70-134	
Isopropylbenzene (Cumene)	ug/m3	50	58.8	118	70-140	
m&p-Xylene	ug/m3	88.3	78.5	89	70-130	
Methyl-tert-butyl ether	ug/m3	91.6	68.2	74	66-148	
Naphthalene	ug/m3	53.3	47.5	89	53-150	
o-Xylene	ug/m3	44.1	37.6	85	70-130	
Toluene	ug/m3	38.3	34.6	90	70-130	
Xylene (Total)	ug/m3	132	116	88	70-141	

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QUALITY CONTROL DATA

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

QC Batch: 465257 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10381907009, 10381907010, 10381907011, 10381907012, 10381907013, 10381907014, 10381907019

METHOD BLANK: 2543663 | Matrix: Air
Associated Lab Samples: 10381907009, 10381907010, 10381907011, 10381907012, 10381907013, 10381907014, 10381907019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/23/17 11:43	
1,2-Dibromoethane (EDB)	ug/m3	<0.77	3.9	0.77	03/23/17 11:43	
1,2-Dichloroethane	ug/m3	<0.20	0.41	0.20	03/23/17 11:43	
1,3,5-Trimethylbenzene	ug/m3	<0.18	2.5	0.18	03/23/17 11:43	
Benzene	ug/m3	<0.12	0.32	0.12	03/23/17 11:43	
Ethylbenzene	ug/m3	<0.42	2.2	0.42	03/23/17 11:43	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/23/17 11:43	
m&p-Xylene	ug/m3	<0.79	4.4	0.79	03/23/17 11:43	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/23/17 11:43	
Naphthalene	ug/m3	<0.30	2.7	0.30	03/23/17 11:43	
o-Xylene	ug/m3	<0.35	2.2	0.35	03/23/17 11:43	
Toluene	ug/m3	<0.15	0.77	0.15	03/23/17 11:43	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/23/17 11:43	

LABORATORY CONTROL SAMPLE: 2543664

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	50	53.9	108	70-136	
1,2-Dibromoethane (EDB)	ug/m3	78.1	82.6	106	70-130	
1,2-Dichloroethane	ug/m3	41.1	53.5	130	70-130	CH
1,3,5-Trimethylbenzene	ug/m3	50	54.2	109	70-133	
Benzene	ug/m3	32.5	40.4	124	70-130	
Ethylbenzene	ug/m3	44.1	46.6	106	70-134	
Isopropylbenzene (Cumene)	ug/m3	50	54.7	110	70-140	
m&p-Xylene	ug/m3	88.3	91.4	104	70-130	
Methyl-tert-butyl ether	ug/m3	91.6	111	121	66-148	
Naphthalene	ug/m3	53.3	61.3	115	53-150	
o-Xylene	ug/m3	44.1	46.2	105	70-130	
Toluene	ug/m3	38.3	39.7	104	70-130	
Xylene (Total)	ug/m3	132	138	104	70-141	

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QUALIFIERS

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

C0	Result confirmed by second analysis.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11109626-04 PES Indoor Air
Pace Project No.: 10381907

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10381907001	**AOI6-AI-17-09**	TO-15	465254		
10381907003	**AOI6-AI-17-11**	TO-15	465212		
10381907004	**AOI6-AI-17-12**	TO-15	465212		
10381907005	**AOI6-AI-17-13**	TO-15	465212		
10381907006	**AOI6-AI-17-14**	TO-15	465212		
10381907007	**AOI6-AI-17-06**	TO-15	465212		
10381907008	**AOI6-AI-17-07R**	TO-15	464884		
10381907009	**AOI3-AI-17-01**	TO-15	465257		
10381907010	**AOI3-AI-17-02**	TO-15	465257		
10381907011	**AOI3-AI-17-03**	TO-15	465257		
10381907012	**AOI3-AI-17-04**	TO-15	465257		
10381907013	**AOI3-AI-17-05**	TO-15	465257		
10381907014	**AOI3-AI-17-06**	TO-15	465257		
10381907015	**AOI3-AI-17-07**	TO-15	464884		
10381907016	**AOI3-AI-17-08**	TO-15	465212		
10381907017	**AOI4-AI-17-01**	TO-15	465212		
10381907018	**AOI4-AA-17-01**	TO-15	465212		
10381907019	**AOI8-AI-17-09**	TO-15	465257		
10381907020	**AOI8-AI-17-10**	TO-15	465212		
10381907021	**AOI8-AI-17-11**	TO-15	465212		

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

26267

Page: 1 of 2

Section A Required Client Information:

Company: GHD
Address: 410 Eagleview Blvd, #110, Exton, PA 19341
Email To: David.Steele@ghd.com
Phone: 610 321 1800 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Steele
Copy To:
Purchase Order No.: 11109626-04
Project Name: PES Indoor Air Sampling
Project Number: 11109626-04

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other____

Location of Sampling by State _____

Reporting Units: ug/m³___ mg/m³___ PPBV___ PPMV___ Other___

Report Level II.___ III.___ IV.___ Other_____

Valid Media Codes: MEDIA / CODE — Tedlar Bag TB; 1 Liter Summa Can 1LC; 6 Liter Summa Can 6LC; Low Volume Puff LVP; High Volume Puff HVP; Other PM10

ITEM #	Section D Required Client Information: AIR SAMPLE ID (Sample IDs MUST BE UNIQUE)	MEDIA CODE	PID Reading (Client only)	COLLECTED: COMPOSITE START END/GRAB DATE	TIME	COMPOSITE - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	Method: PM10	3C-Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14	TO-15	TO15 Short List*	Pace Lab ID (10381907)
1	AOI6-AI-17-09	6LC		3-8-17	0803	3-8-17	1603	-30†	5.0	0868	01024								✓	✓	01
2	AOI6-AI-17-10	6LC		3-8-17	0818	3-8-17	1537	-27	0.0	0865	00911								✓	✓	02
3	AOI6-AI-17-11	6LC		3-8-17	0827	3-8-17	1627	-30	3.5	3419	01161								✓	✓	03
4	AOI6-AI-17-12	6LC		3-8-17	0842	3-8-17	1638	-29.5	0.0	1628	01419								✓	✓	04
5	AOI6-AI-17-13	6LC		3-8-17	0834	3-8-17	1634	-30	1.0	3406	00916								✓	✓	05
6	AOI6-AI-17-14	6LC		3-8-17	0900	3-8-17	1708	-30	2.0	0862	04512								✓	✓	06
7	~~AOI6-AI-17-22~~ (FCR)	~~6LC~~		~~3-8-17~~	~~0914~~	~~3-8-17~~	~~1712~~	~~-30†~~	~~0.0~~	~~0854~~	~~0712~~								✓	✓	
8	AOI6-AI-17-06	6LC		3-8-17	0955	3-8-17	1755	-29.0	0.0	3420	01167									✓	07
9	AOI6-AI-17-07R	6LC		3-9-17	0857	3-9-17	1657	~~-26.5~~ -4		1350	F/C 00304									✓	08
10	AOI3-AI-17-01	6LC		3-9-17	0656	3-9-17	1456	-30†	-6†	0852	00905									✓	09
11	AOI3-AI-17-02	6LC		3-9-17	0705	3-9-17	1505	-30†	-2	3813	02126									✓	10
12	AOI3-AI-17-03	6LC		3-9-17	0658	3-9-17	1458	-30†	-7†	3814	04532									✓	11

FCR

Comments:
Benzene, Toluene, Ethylbenzene, Xylenes (o-, m-, p- isomers), Cumene, Naphthalene, MTBE, 1,2,4 Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,2-Dibromoethane, 1,2-Dichloroethane

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	3/10/17	1215	[signature]	3/10/17	1215
[signature]	3/14/17	1330	[signature]	3/14/17	1330

SAMPLE CONDITIONS

	Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Donovan Young
SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 03/08/17

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

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26302

Section A Required Client Information:
Company: GHD
Address: 410 Eagleview Blvd, #110, Exton, PA 19341
Email To: David.Steele@ghd.com
Phone: 610-321-8005 Fax:
Requested Due Date/TAT:

Section B Required Project Information:
Report To: David Steele
Copy To:
Purchase Order No.: 11109626-04
Project Name: PES Indoor Air Sampling
Project Number: 11109626-04

Section C Invoice Information:
Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other____

Location of Sampling by State _____

Reporting Units: ug/m³___ mg/m³___ PPBV___ PPMV___ Other___

Report Level: II.___ III.___ IV.___ Other_____

Method: PM10 | 3C- Fixed Gas (%) | TO-3 | TO-3M (Methane) | TO-4 (PCBs) | TO-13 (PAH) | TO-14 | TO-15 | TO15 Short List*

'Section D Required Client Information

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	AIR SAMPLE ID (Sample IDs MUST BE UNIQUE)	MEDIA CODE	PID Reading (Client only)	COLLECTED Composite Start End/Grab DATE	TIME	Composite - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	TO15 Short List*	Pace Lab ID
1	AOI3-AI-17-04	6LC		3-9-17	0707	3-9-17	1507	-30†	-4†	0863	010229	✓	012
2	AOI3-AI-17-05	6LC		3-9-17	0707	3-9-17	1446	-29	0.0	0853	020076	✓	013
3	AOI3-AI-17-06	6LC		3-9-17	0703	3-9-17	1503	-30†	-2	0866	021331	✓	014
4	AOI3-AI-17-07	6LC		3-9-17	0648	3-9-17	1448	-30†	-4†	1648 F/C	0307	✓	015
5	AOI3-AI-17-08	6LC		3-9-17	0757	3-9-17	1608	-30	-4	3173 F/C	0362	✓	016
6	~~AOI3-AI-17-01~~	6LC		~~3-9-17~~								✓	~~17~~
7	~~AOI6-AI-17-15~~	6LC		~~3-9-17~~								✓	~~18~~
8	AOI4-AI-17-01	6LC		3-9-17	0840	3-9-17	1640	-29	-5	1339 F/C	1014	✓	CHF 3/15/17 ~~19~~ 017
9	AOI4-AA-17-01	6LC		3-9-17	0842	3-9-17	1642	-30†	-5	1344 F/C	0514	✓	~~20~~ 018
10	AOI8-AI-17-09	6LC		3-9-17	0759	3-9-17	1610	-30†	-5.5	1669	0107	✓	~~2~~ 019
11	AOI8-AI-17-10	6LC		3-9-17	0811	3-9-17	1617	-30	-4	0153	0312	✓	020
12	AOI8-AI-17-11	6LC		3-9-17	0838	3-9-17	1642	-30	-4	0097	0047	✓	021

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	3/10/17	1215	[signature]	3/10/17	1215
[signature]	3/10/17	1330	[signature]	3/10/17	1630

SAMPLE CONDITIONS

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
AMB	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

ORIGINAL

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 26APR2016 Page 1 of 1
	Document No.: F-MN-A-106-rev.11	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: GHD

Project #: WO#: 10381907

10381907

Courier: [X] Fed Ex [ ] UPS [ ] Speedee [ ] Client [ ] Commercial [ ] Pace [ ] Other:

Tracking Number: 7858 6984 7161; 5926; 7150, 7140, 7172 5917, 7139, 7128, 5940, 5939, 5906

Custody Seal on Cooler/Box Present? [ ] Yes [X] No **Seals Intact?** [ ] Yes [X] No

Optional: Proj. Due Date: Proj. Name:

Packing Material: [ ] Bubble Wrap [ ] Bubble Bags [X] Foam [ ] None [ ] Tin Can [ ] Other: **Temp Blank rec:** [ ] Yes [X] No

Temp. (TO17 and TO13 samples only) (°C): — **Corrected Temp (°C):** — **Thermom. Used:** [ ] B88A912167504 [ ] B88A0143310098 [ ] 151401163 [ ] 151401164

Temp should be above freezing to 6°C **Correction Factor:** AMB **Date & Initials of Person Examining Contents:** CLH 3/14/17

Type of ice Received [ ] Blue [ ] Wet [ ] None

				Comments:
Chain of Custody Present?	[X] Yes	[ ] No	[ ] N/A	1.
Chain of Custody Filled Out?	[X] Yes	[ ] No	[ ] N/A	2.
Chain of Custody Relinquished?	[X] Yes	[ ] No	[ ] N/A	3.
Sampler Name and/or Signature on COC?	[ ] Yes	[ ] No	[ ] N/A	4.
Samples Arrived within Hold Time?	[ ] Yes	[ ] No	[ ] N/A	5.
Short Hold Time Analysis (<72 hr)?	[ ] Yes	[X] No	[ ] N/A	6.
Rush Turn Around Time Requested?	[ ] Yes	[X] No	[ ] N/A	7.
Sufficient Volume?	[X] Yes	[ ] No	[ ] N/A	8.
Correct Containers Used?	[X] Yes	[ ] No	[ ] N/A	9.
-Pace Containers Used?	[X] Yes	[ ] No	[ ] N/A	
Containers Intact?	[X] Yes	[ ] No	[ ] N/A	10.
Media: Air Can Airbag Filter TDT Passive				11.
Sample Labels Match COC?	[X] Yes	[ ] No	[ ] N/A	12. Part of order received 3/15/17 1090

Samples Received: FF, FT

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
AOI6-AI-17-09	*0868	*01024	AOI3-AI-17-03	*3814	*04332
" 10	*0865	*00911	" " 04	*0863	*01029
" 11	*3419	*01161	05	*0853	*02076
" 12	*1626	*01419	06	*0866	*02131
" 13	*3406	*00916	07	*2836	0307
" 14	*862	*04512	08	*1373	0362
" 06	*3420	*01167	AOI4-AI-17-01	*~~0857~~ 1339	~~00905~~ 1014
" 07R	*1350	0304	AA-01	*~~1339~~ 1344	~~1014~~ 0514
AOI3 " 01	0852	*00905	AOI6-09	CLH 3/14/17 ~~*0153~~ 1669	*~~FC0312~~ 01077
" 02	*3813	*02126	" 10	*0153	FC 0312

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** [ ] Yes [ ] No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Nathan Boberg **Date:** 3/16/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 26APR2016 Page 1 of 1
	Document No.: F-MN-A-106-rev.11	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: _____ **Project #:**

Courier: ☐Fed Ex ☐UPS ☐Speedee ☐Client ☐Commercial ☐Pace ☐Other:_____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐Yes ☐No **Seals Intact?** ☐Yes ☐No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☐Foam ☐None ☐Tin Can ☐Other:_____ **Temp Blank rec:** ☐Yes ☐No

Temp. (TO17 and TO13 samples only) (°C): _____ **Corrected Temp (°C):** _____ **Thermom. Used:** ☐B88A912167504 ☐B88A0143310098 ☐151401163 ☐151401164

Temp should be above freezing to 6°C **Correction Factor:** _____ **Date & Initials of Person Examining Contents:** _____

Type of ice Received ☐Blue ☐Wet ☐None

				Comments:
Chain of Custody Present?	☐Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☐Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☐Yes	☐No	☐N/A	3.
Sampler Name and/or Signature on COC?	☐Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☐Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☐No	☐N/A	6.
Rush Turn Around Time Requested?	☐Yes	☐No	☐N/A	7.
Sufficient Volume?	☐Yes	☐No	☐N/A	8.
Correct Containers Used?	☐Yes	☐No	☐N/A	9.
-Pace Containers Used?	☐Yes	☐No	☐N/A	
Containers Intact?	☐Yes	☐No	☐N/A	10.
Media: Air Can Airbag Filter TDT Passive				11.
Sample Labels Match COC?	☐Yes	☐No	☐N/A	12.

Samples Received:

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
AOI8-AP.1711	# 0097	FC 0047			

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Nathan Boberg **Date:** 3/16/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

April 03, 2017

David Steele
GHD
410 Eagleview Blvd.
Exton, PA 19341

RE: Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Dear David Steele:
Enclosed are the analytical results for sample(s) received by the laboratory between March 17, 2017 and March 20, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott Unze for
Nathan Boberg
nathan.boberg@pacelabs.com
(612)607-6407
Project Manager

Enclosures

cc: Paul McMahon, GHD

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Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: UST-078
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: MN00064
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia WW Certification #: 382
Wisconsin Certification #: 999407970
Wyoming via EPA Region 8 Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10382287001	**AOI5-AI-17-01**	Air	03/10/17 14:42	03/17/17 10:10
10382287002	**AOI5-AI-17-02**	Air	03/10/17 15:07	03/17/17 10:10
10382287003	**AOI5-AI-17-03**	Air	03/10/17 14:50	03/17/17 10:10
10382287004	**AOI5-AI-17-04**	Air	03/10/17 14:46	03/17/17 10:10
10382287005	**AOI5-AI-17-06**	Air	03/10/17 15:04	03/17/17 10:10
10382287006	**AOI5-AI-17-05**	Air	03/10/17 14:35	03/17/17 10:10
10382287007	**AOI5-AI-17-07**	Air	03/10/17 14:44	03/17/17 10:10
10382287008	**AOI6-AI-17-22**	Air	03/08/17 17:12	03/17/17 10:10
10382287009	**AOI2-AI-17-01**	Air	03/10/17 15:30	03/17/17 10:10
10382287010	**AOI2-AI-17-08**	Air	03/10/17 16:11	03/17/17 10:10
10382287011	**AOI2-AI-17-10**	Air	03/10/17 15:42	03/17/17 10:10
10382287012	**AOI2-AI-17-03**	Air	03/10/17 15:58	03/17/17 10:10
10382287013	**AOI2-AI-17-07**	Air	03/10/17 16:07	03/17/17 10:10
10382287014	**AOI2-AI-17-04**	Air	03/10/17 15:55	03/17/17 10:10
10382287015	**AOI2-AI-17-16**	Air	03/10/17 16:21	03/17/17 10:10
10382287016	**AOI2-AI-17-17**	Air	03/10/17 16:27	03/17/17 10:10
10382287017	**AOI2-AI-17-06**	Air	03/10/17 16:02	03/17/17 10:10
10382287018	**AOI3-AI-17-09**	Air	03/10/17 13:35	03/17/17 10:10
10382287019	**Unused Can #0852**	Air		03/20/17 09:15
10382287020	**Unused Can #0102**	Air		03/20/17 09:15
10382287021	**Unused Can #0071**	Air		03/20/17 09:15

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SAMPLE ANALYTE COUNT

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10382287001	**AOI5-AI-17-01**	TO-15	EMC	13
10382287002	**AOI5-AI-17-02**	TO-15	EMC	13
10382287003	**AOI5-AI-17-03**	TO-15	EMC	13
10382287004	**AOI5-AI-17-04**	TO-15	EMC	13
10382287005	**AOI5-AI-17-06**	TO-15	EMC	13
10382287006	**AOI5-AI-17-05**	TO-15	EMC	13
10382287007	**AOI5-AI-17-07**	TO-15	EMC	13
10382287008	**AOI6-AI-17-22**	TO-15	EMC	13
10382287009	**AOI2-AI-17-01**	TO-15	EMC	13
10382287010	**AOI2-AI-17-08**	TO-15	EMC	13
10382287011	**AOI2-AI-17-10**	TO-15	EMC	13
10382287012	**AOI2-AI-17-03**	TO-15	EMC	13
10382287013	**AOI2-AI-17-07**	TO-15	EMC	13
10382287014	**AOI2-AI-17-04**	TO-15	EMC	13
10382287015	**AOI2-AI-17-16**	TO-15	EMC	13
10382287016	**AOI2-AI-17-17**	TO-15	EMC	13
10382287017	**AOI2-AI-17-06**	TO-15	EMC	13
10382287018	**AOI3-AI-17-09**	TO-15	EMC	13

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI5-AI-17-01 **Lab ID: 10382287001** Collected: 03/10/17 14:42 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**19.4**	ug/m3	0.61	0.23	1.88		03/22/17 21:22	71-43-2	
1,2-Dibromoethane (EDB)	**<1.5**	ug/m3	7.3	1.5	1.88		03/22/17 21:22	106-93-4	
1,2-Dichloroethane	**<0.39**	ug/m3	0.77	0.39	1.88		03/22/17 21:22	107-06-2	
Ethylbenzene	**5.2**	ug/m3	4.1	0.80	1.88		03/22/17 21:22	100-41-4	
Isopropylbenzene (Cumene)	**<0.26**	ug/m3	4.7	0.26	1.88		03/22/17 21:22	98-82-8	
Methyl-tert-butyl ether	**<0.57**	ug/m3	6.9	0.57	1.88		03/22/17 21:22	1634-04-4	
Naphthalene	**1.4J**	ug/m3	5.0	0.57	1.88		03/22/17 21:22	91-20-3	
Toluene	**3.1**	ug/m3	1.4	0.29	1.88		03/22/17 21:22	108-88-3	
1,2,4-Trimethylbenzene	**3.1J**	ug/m3	4.7	0.24	1.88		03/22/17 21:22	95-63-6	
1,3,5-Trimethylbenzene	**<0.34**	ug/m3	4.7	0.34	1.88		03/22/17 21:22	108-67-8	
Xylene (Total)	**30.4**	ug/m3	5.0	2.1	1.88		03/22/17 21:22	1330-20-7	
m&p-Xylene	**19.9**	ug/m3	8.3	1.5	1.88		03/22/17 21:22	179601-23-1	
o-Xylene	**10.5**	ug/m3	4.1	0.66	1.88		03/22/17 21:22	95-47-6	

Sample: AOI5-AI-17-02 **Lab ID: 10382287002** Collected: 03/10/17 15:07 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**7.0**	ug/m3	0.48	0.18	1.49		03/22/17 22:19	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	5.8	1.2	1.49		03/22/17 22:19	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/22/17 22:19	107-06-2	
Ethylbenzene	**2.4J**	ug/m3	3.3	0.63	1.49		03/22/17 22:19	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.7	0.21	1.49		03/22/17 22:19	98-82-8	
Methyl-tert-butyl ether	**<0.45**	ug/m3	5.5	0.45	1.49		03/22/17 22:19	1634-04-4	
Naphthalene	**0.78J**	ug/m3	4.0	0.45	1.49		03/22/17 22:19	91-20-3	
Toluene	**4.1**	ug/m3	1.1	0.23	1.49		03/22/17 22:19	108-88-3	
1,2,4-Trimethylbenzene	**2.6J**	ug/m3	3.7	0.19	1.49		03/22/17 22:19	95-63-6	
1,3,5-Trimethylbenzene	**<0.27**	ug/m3	3.7	0.27	1.49		03/22/17 22:19	108-67-8	
Xylene (Total)	**9.0**	ug/m3	3.9	1.7	1.49		03/22/17 22:19	1330-20-7	
m&p-Xylene	**6.2J**	ug/m3	6.6	1.2	1.49		03/22/17 22:19	179601-23-1	
o-Xylene	**2.9J**	ug/m3	3.3	0.52	1.49		03/22/17 22:19	95-47-6	

Sample: AOI5-AI-17-03 **Lab ID: 10382287003** Collected: 03/10/17 14:50 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**7.3**	ug/m3	0.50	0.19	1.55		03/22/17 23:16	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	6.1	1.2	1.55		03/22/17 23:16	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/22/17 23:16	107-06-2	
Ethylbenzene	**2.9J**	ug/m3	3.4	0.66	1.55		03/22/17 23:16	100-41-4	

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI5-AI-17-03 **Lab ID: 10382287003** Collected: 03/10/17 14:50 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/22/17 23:16	98-82-8	
Methyl-tert-butyl ether	**<0.47**	ug/m3	5.7	0.47	1.55		03/22/17 23:16	1634-04-4	
Naphthalene	**0.79J**	ug/m3	4.1	0.47	1.55		03/22/17 23:16	91-20-3	
Toluene	**11.7**	ug/m3	1.2	0.24	1.55		03/22/17 23:16	108-88-3	
1,2,4-Trimethylbenzene	**3.6J**	ug/m3	3.9	0.19	1.55		03/22/17 23:16	95-63-6	
1,3,5-Trimethylbenzene	**3.1J**	ug/m3	3.9	0.28	1.55		03/22/17 23:16	108-67-8	
Xylene (Total)	**11.7**	ug/m3	4.1	1.8	1.55		03/22/17 23:16	1330-20-7	
m&p-Xylene	**8.1**	ug/m3	6.8	1.2	1.55		03/22/17 23:16	179601-23-1	
o-Xylene	**3.6**	ug/m3	3.4	0.54	1.55		03/22/17 23:16	95-47-6	

Sample: AOI5-AI-17-04 **Lab ID: 10382287004** Collected: 03/10/17 14:46 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**6.2**	ug/m3	0.48	0.18	1.49		03/29/17 21:01	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.3	1.2	1.49		03/29/17 21:01	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/29/17 21:01	107-06-2	
Ethylbenzene	**8.0**	ug/m3	1.3	0.63	1.49		03/29/17 21:01	100-41-4	
Isopropylbenzene (Cumene)	**36.6**	ug/m3	3.7	0.21	1.49		03/29/17 21:01	98-82-8	
Methyl-tert-butyl ether	**0.52J**	ug/m3	5.5	0.45	1.49		03/29/17 21:01	1634-04-4	
Naphthalene	**2.1J**	ug/m3	4.0	0.45	1.49		03/29/17 21:01	91-20-3	
Toluene	**87.7**	ug/m3	1.1	0.23	1.49		03/29/17 21:01	108-88-3	
1,2,4-Trimethylbenzene	**425**	ug/m3	74.4	3.7	29.8		03/30/17 12:16	95-63-6	
1,3,5-Trimethylbenzene	**186**	ug/m3	1.5	0.27	1.49		03/29/17 21:01	108-67-8	
Xylene (Total)	**95.9**	ug/m3	3.9	1.7	1.49		03/29/17 21:01	1330-20-7	
m&p-Xylene	**45.2**	ug/m3	2.6	1.2	1.49		03/29/17 21:01	179601-23-1	
o-Xylene	**50.7**	ug/m3	1.3	0.52	1.49		03/29/17 21:01	95-47-6	

Sample: AOI5-AI-17-06 **Lab ID: 10382287005** Collected: 03/10/17 15:04 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**6.2**	ug/m3	0.50	0.19	1.55		03/29/17 21:29	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/29/17 21:29	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/29/17 21:29	107-06-2	
Ethylbenzene	**0.75J**	ug/m3	1.4	0.66	1.55		03/29/17 21:29	100-41-4	
Isopropylbenzene (Cumene)	**3.3J**	ug/m3	3.9	0.21	1.55		03/29/17 21:29	98-82-8	
Methyl-tert-butyl ether	**0.57J**	ug/m3	5.7	0.47	1.55		03/29/17 21:29	1634-04-4	
Naphthalene	**1.8J**	ug/m3	4.1	0.47	1.55		03/29/17 21:29	91-20-3	
Toluene	**2.7**	ug/m3	1.2	0.24	1.55		03/29/17 21:29	108-88-3	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI5-AI-17-06 **Lab ID: 10382287005** Collected: 03/10/17 15:04 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
1,2,4-Trimethylbenzene	**0.94J**	ug/m3	3.9	0.19	1.55		03/30/17 12:44	95-63-6	
1,3,5-Trimethylbenzene	**0.36J**	ug/m3	1.5	0.28	1.55		03/29/17 21:29	108-67-8	
Xylene (Total)	**<1.8**	ug/m3	4.1	1.8	1.55		03/29/17 21:29	1330-20-7	
m&p-Xylene	**1.9J**	ug/m3	2.7	1.2	1.55		03/29/17 21:29	179601-23-1	
o-Xylene	**0.92J**	ug/m3	1.4	0.54	1.55		03/29/17 21:29	95-47-6	

Sample: AOI5-AI-17-05 **Lab ID: 10382287006** Collected: 03/10/17 14:35 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.2**	ug/m3	0.48	0.18	1.49		03/29/17 21:57	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.3	1.2	1.49		03/29/17 21:57	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/29/17 21:57	107-06-2	
Ethylbenzene	**0.85J**	ug/m3	1.3	0.63	1.49		03/29/17 21:57	100-41-4	
Isopropylbenzene (Cumene)	**7.9**	ug/m3	3.7	0.21	1.49		03/29/17 21:57	98-82-8	
Methyl-tert-butyl ether	**0.48J**	ug/m3	5.5	0.45	1.49		03/29/17 21:57	1634-04-4	
Naphthalene	**1.6J**	ug/m3	4.0	0.45	1.49		03/29/17 21:57	91-20-3	
Toluene	**6.7**	ug/m3	1.1	0.23	1.49		03/29/17 21:57	108-88-3	
1,2,4-Trimethylbenzene	**0.93J**	ug/m3	3.7	0.19	1.49		03/29/17 21:57	95-63-6	
1,3,5-Trimethylbenzene	**0.30J**	ug/m3	1.5	0.27	1.49		03/29/17 21:57	108-67-8	
Xylene (Total)	**<1.7**	ug/m3	3.9	1.7	1.49		03/29/17 21:57	1330-20-7	
m&p-Xylene	**2.2J**	ug/m3	2.6	1.2	1.49		03/29/17 21:57	179601-23-1	
o-Xylene	**0.91J**	ug/m3	1.3	0.52	1.49		03/29/17 21:57	95-47-6	

Sample: AOI5-AI-17-07 **Lab ID: 10382287007** Collected: 03/10/17 14:44 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**6.2**	ug/m3	0.50	0.19	1.55		03/29/17 22:24	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/29/17 22:24	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/29/17 22:24	107-06-2	
Ethylbenzene	**<0.66**	ug/m3	1.4	0.66	1.55		03/29/17 22:24	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/29/17 22:24	98-82-8	
Methyl-tert-butyl ether	**0.55J**	ug/m3	5.7	0.47	1.55		03/29/17 22:24	1634-04-4	
Naphthalene	**1.0J**	ug/m3	4.1	0.47	1.55		03/29/17 22:24	91-20-3	
Toluene	**3.3**	ug/m3	1.2	0.24	1.55		03/29/17 22:24	108-88-3	
1,2,4-Trimethylbenzene	**0.72J**	ug/m3	3.9	0.19	1.55		03/29/17 22:24	95-63-6	
1,3,5-Trimethylbenzene	**<0.28**	ug/m3	1.5	0.28	1.55		03/29/17 22:24	108-67-8	
Xylene (Total)	**<1.8**	ug/m3	4.1	1.8	1.55		03/29/17 22:24	1330-20-7	
m&p-Xylene	**1.5J**	ug/m3	2.7	1.2	1.55		03/29/17 22:24	179601-23-1	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI5-AI-17-07 **Lab ID: 10382287007** Collected: 03/10/17 14:44 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
o-Xylene	**0.67J**	ug/m3	1.4	0.54	1.55		03/29/17 22:24	95-47-6	

Sample: AOI6-AI-17-22 **Lab ID: 10382287008** Collected: 03/08/17 17:12 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**10.3**	ug/m3	0.44	0.16	1.34		03/29/17 20:33	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	2.1	1.0	1.34		03/29/17 20:33	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/29/17 20:33	107-06-2	
Ethylbenzene	**<0.57**	ug/m3	1.2	0.57	1.34		03/29/17 20:33	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/29/17 20:33	98-82-8	
Methyl-tert-butyl ether	**0.47J**	ug/m3	4.9	0.41	1.34		03/29/17 20:33	1634-04-4	
Naphthalene	**1.6J**	ug/m3	3.6	0.41	1.34		03/29/17 20:33	91-20-3	
Toluene	**2.8**	ug/m3	1.0	0.21	1.34		03/29/17 20:33	108-88-3	
1,2,4-Trimethylbenzene	**0.58J**	ug/m3	3.3	0.17	1.34		03/29/17 20:33	95-63-6	
1,3,5-Trimethylbenzene	**<0.25**	ug/m3	1.3	0.25	1.34		03/29/17 20:33	108-67-8	
Xylene (Total)	**<1.5**	ug/m3	3.6	1.5	1.34		03/29/17 20:33	1330-20-7	
m&p-Xylene	**1.6J**	ug/m3	2.4	1.1	1.34		03/29/17 20:33	179601-23-1	
o-Xylene	**0.67J**	ug/m3	1.2	0.47	1.34		03/29/17 20:33	95-47-6	

Sample: AOI2-AI-17-01 **Lab ID: 10382287009** Collected: 03/10/17 15:30 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.90J**	ug/m3	0.94	0.35	2.88		03/29/17 23:21	71-43-2	
1,2-Dibromoethane (EDB)	**<2.2**	ug/m3	4.5	2.2	2.88		03/29/17 23:21	106-93-4	
1,2-Dichloroethane	**<0.59**	ug/m3	1.2	0.59	2.88		03/29/17 23:21	107-06-2	
Ethylbenzene	**2.6**	ug/m3	2.5	1.2	2.88		03/29/17 23:21	100-41-4	
Isopropylbenzene (Cumene)	**<0.40**	ug/m3	7.2	0.40	2.88		03/29/17 23:21	98-82-8	
Methyl-tert-butyl ether	**<0.87**	ug/m3	10.6	0.87	2.88		03/29/17 23:21	1634-04-4	
Naphthalene	**1.5J**	ug/m3	7.7	0.88	2.88		03/29/17 23:21	91-20-3	
Toluene	**10.4**	ug/m3	2.2	0.44	2.88		03/29/17 23:21	108-88-3	
1,2,4-Trimethylbenzene	**2.2J**	ug/m3	7.2	0.36	2.88		03/29/17 23:21	95-63-6	
1,3,5-Trimethylbenzene	**0.76J**	ug/m3	2.9	0.53	2.88		03/29/17 23:21	108-67-8	
Xylene (Total)	**14.1**	ug/m3	7.6	3.3	2.88		03/29/17 23:21	1330-20-7	
m&p-Xylene	**10.2**	ug/m3	5.1	2.3	2.88		03/29/17 23:21	179601-23-1	
o-Xylene	**3.9**	ug/m3	2.5	1.0	2.88		03/29/17 23:21	95-47-6	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI2-AI-17-08 **Lab ID: 10382287010** Collected: 03/10/17 16:11 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.48J**	ug/m3	0.48	0.18	1.49		03/29/17 23:48	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.3	1.2	1.49		03/29/17 23:48	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/29/17 23:48	107-06-2	
Ethylbenzene	**<0.63**	ug/m3	1.3	0.63	1.49		03/29/17 23:48	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.7	0.21	1.49		03/29/17 23:48	98-82-8	
Methyl-tert-butyl ether	**0.46J**	ug/m3	5.5	0.45	1.49		03/29/17 23:48	1634-04-4	
Naphthalene	**1.4J**	ug/m3	4.0	0.45	1.49		03/29/17 23:48	91-20-3	
Toluene	**3.6**	ug/m3	1.1	0.23	1.49		03/29/17 23:48	108-88-3	
1,2,4-Trimethylbenzene	**6.9**	ug/m3	3.7	0.19	1.49		03/29/17 23:48	95-63-6	
1,3,5-Trimethylbenzene	**1.7**	ug/m3	1.5	0.27	1.49		03/29/17 23:48	108-67-8	
Xylene (Total)	**<1.7**	ug/m3	3.9	1.7	1.49		03/29/17 23:48	1330-20-7	
m&p-Xylene	**1.3J**	ug/m3	2.6	1.2	1.49		03/29/17 23:48	179601-23-1	
o-Xylene	**0.94J**	ug/m3	1.3	0.52	1.49		03/29/17 23:48	95-47-6	

Sample: AOI2-AI-17-10 **Lab ID: 10382287011** Collected: 03/10/17 15:42 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.54**	ug/m3	0.50	0.19	1.55		03/30/17 01:07	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/30/17 01:07	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/30/17 01:07	107-06-2	
Ethylbenzene	**0.71J**	ug/m3	1.4	0.66	1.55		03/30/17 01:07	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/30/17 01:07	98-82-8	
Methyl-tert-butyl ether	**0.75J**	ug/m3	5.7	0.47	1.55		03/30/17 01:07	1634-04-4	
Naphthalene	**0.68J**	ug/m3	4.1	0.47	1.55		03/30/17 01:07	91-20-3	
Toluene	**3.9**	ug/m3	1.2	0.24	1.55		03/30/17 01:07	108-88-3	
1,2,4-Trimethylbenzene	**0.53J**	ug/m3	3.9	0.19	1.55		03/30/17 01:07	95-63-6	
1,3,5-Trimethylbenzene	**<0.28**	ug/m3	1.5	0.28	1.55		03/30/17 01:07	108-67-8	
Xylene (Total)	**<1.8**	ug/m3	4.1	1.8	1.55		03/30/17 01:07	1330-20-7	
m&p-Xylene	**1.8J**	ug/m3	2.7	1.2	1.55		03/30/17 01:07	179601-23-1	
o-Xylene	**0.70J**	ug/m3	1.4	0.54	1.55		03/30/17 01:07	95-47-6	

Sample: AOI2-AI-17-03 **Lab ID: 10382287012** Collected: 03/10/17 15:58 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**0.92**	ug/m3	0.50	0.19	1.55		03/30/17 01:35	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/30/17 01:35	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/30/17 01:35	107-06-2	
Ethylbenzene	**9.7**	ug/m3	1.4	0.66	1.55		03/30/17 01:35	100-41-4	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI2-AI-17-03 **Lab ID: 10382287012** Collected: 03/10/17 15:58 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/30/17 01:35	98-82-8	
Methyl-tert-butyl ether	**0.52J**	ug/m3	5.7	0.47	1.55		03/30/17 01:35	1634-04-4	
Naphthalene	**0.64J**	ug/m3	4.1	0.47	1.55		03/30/17 01:35	91-20-3	
Toluene	**3.1**	ug/m3	1.2	0.24	1.55		03/30/17 01:35	108-88-3	
1,2,4-Trimethylbenzene	**0.82J**	ug/m3	3.9	0.19	1.55		03/30/17 01:35	95-63-6	
1,3,5-Trimethylbenzene	**0.32J**	ug/m3	1.5	0.28	1.55		03/30/17 01:35	108-67-8	
Xylene (Total)	**44.0**	ug/m3	4.1	1.8	1.55		03/30/17 01:35	1330-20-7	
m&p-Xylene	**34.9**	ug/m3	2.7	1.2	1.55		03/30/17 01:35	179601-23-1	
o-Xylene	**9.1**	ug/m3	1.4	0.54	1.55		03/30/17 01:35	95-47-6	

Sample: AOI2-AI-17-07 **Lab ID: 10382287013** Collected: 03/10/17 16:07 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**8.4**	ug/m3	0.52	0.20	1.61		03/30/17 02:03	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.5	1.2	1.61		03/30/17 02:03	106-93-4	
1,2-Dichloroethane	**<0.33**	ug/m3	0.66	0.33	1.61		03/30/17 02:03	107-06-2	
Ethylbenzene	**5.6**	ug/m3	1.4	0.68	1.61		03/30/17 02:03	100-41-4	
Isopropylbenzene (Cumene)	**<0.22**	ug/m3	4.0	0.22	1.61		03/30/17 02:03	98-82-8	
Methyl-tert-butyl ether	**0.55J**	ug/m3	5.9	0.49	1.61		03/30/17 02:03	1634-04-4	
Naphthalene	**0.86J**	ug/m3	4.3	0.49	1.61		03/30/17 02:03	91-20-3	
Toluene	**124**	ug/m3	1.2	0.25	1.61		03/30/17 02:03	108-88-3	
1,2,4-Trimethylbenzene	**3.0J**	ug/m3	4.0	0.20	1.61		03/30/17 02:03	95-63-6	
1,3,5-Trimethylbenzene	**1.1J**	ug/m3	1.6	0.29	1.61		03/30/17 02:03	108-67-8	
Xylene (Total)	**24.7**	ug/m3	4.3	1.8	1.61		03/30/17 02:03	1330-20-7	
m&p-Xylene	**18.8**	ug/m3	2.8	1.3	1.61		03/30/17 02:03	179601-23-1	
o-Xylene	**5.9**	ug/m3	1.4	0.57	1.61		03/30/17 02:03	95-47-6	

Sample: AOI2-AI-17-04 **Lab ID: 10382287014** Collected: 03/10/17 15:55 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.2**	ug/m3	0.50	0.19	1.55		03/30/17 02:31	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/30/17 02:31	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/30/17 02:31	107-06-2	
Ethylbenzene	**11.0**	ug/m3	1.4	0.66	1.55		03/30/17 02:31	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/30/17 02:31	98-82-8	
Methyl-tert-butyl ether	**0.51J**	ug/m3	5.7	0.47	1.55		03/30/17 02:31	1634-04-4	
Naphthalene	**0.60J**	ug/m3	4.1	0.47	1.55		03/30/17 02:31	91-20-3	
Toluene	**3.4**	ug/m3	1.2	0.24	1.55		03/30/17 02:31	108-88-3	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI2-AI-17-04 **Lab ID: 10382287014** Collected: 03/10/17 15:55 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
1,2,4-Trimethylbenzene	**0.77J**	ug/m3	3.9	0.19	1.55		03/30/17 02:31	95-63-6	
1,3,5-Trimethylbenzene	**<0.28**	ug/m3	1.5	0.28	1.55		03/30/17 02:31	108-67-8	
Xylene (Total)	**49.9**	ug/m3	4.1	1.8	1.55		03/30/17 02:31	1330-20-7	
m&p-Xylene	**39.5**	ug/m3	2.7	1.2	1.55		03/30/17 02:31	179601-23-1	
o-Xylene	**10.4**	ug/m3	1.4	0.54	1.55		03/30/17 02:31	95-47-6	

Sample: AOI2-AI-17-16 **Lab ID: 10382287015** Collected: 03/10/17 16:21 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**2.0**	ug/m3	0.48	0.18	1.49		03/30/17 03:04	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.3	1.2	1.49		03/30/17 03:04	106-93-4	
1,2-Dichloroethane	**<0.31**	ug/m3	0.61	0.31	1.49		03/30/17 03:04	107-06-2	
Ethylbenzene	**1.1J**	ug/m3	1.3	0.63	1.49		03/30/17 03:04	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.7	0.21	1.49		03/30/17 03:04	98-82-8	
Methyl-tert-butyl ether	**0.97J**	ug/m3	5.5	0.45	1.49		03/30/17 03:04	1634-04-4	
Naphthalene	**5.9**	ug/m3	4.0	0.45	1.49		03/30/17 03:04	91-20-3	
Toluene	**14.4**	ug/m3	1.1	0.23	1.49		03/30/17 03:04	108-88-3	
1,2,4-Trimethylbenzene	**1.9J**	ug/m3	3.7	0.19	1.49		03/30/17 03:04	95-63-6	
1,3,5-Trimethylbenzene	**0.46J**	ug/m3	1.5	0.27	1.49		03/30/17 03:04	108-67-8	
Xylene (Total)	**5.0**	ug/m3	3.9	1.7	1.49		03/30/17 03:04	1330-20-7	
m&p-Xylene	**3.6**	ug/m3	2.6	1.2	1.49		03/30/17 03:04	179601-23-1	
o-Xylene	**1.5**	ug/m3	1.3	0.52	1.49		03/30/17 03:04	95-47-6	

Sample: AOI2-AI-17-17 **Lab ID: 10382287016** Collected: 03/10/17 16:27 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.3**	ug/m3	0.50	0.19	1.55		03/30/17 03:32	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.4	1.2	1.55		03/30/17 03:32	106-93-4	
1,2-Dichloroethane	**<0.32**	ug/m3	0.64	0.32	1.55		03/30/17 03:32	107-06-2	
Ethylbenzene	**4.5**	ug/m3	1.4	0.66	1.55		03/30/17 03:32	100-41-4	
Isopropylbenzene (Cumene)	**<0.21**	ug/m3	3.9	0.21	1.55		03/30/17 03:32	98-82-8	
Methyl-tert-butyl ether	**0.84J**	ug/m3	5.7	0.47	1.55		03/30/17 03:32	1634-04-4	
Naphthalene	**43.7**	ug/m3	4.1	0.47	1.55		03/30/17 03:32	91-20-3	
Toluene	**4.6**	ug/m3	1.2	0.24	1.55		03/30/17 03:32	108-88-3	
1,2,4-Trimethylbenzene	**42.5**	ug/m3	3.9	0.19	1.55		03/30/17 03:32	95-63-6	
1,3,5-Trimethylbenzene	**11.3**	ug/m3	1.5	0.28	1.55		03/30/17 03:32	108-67-8	
Xylene (Total)	**29.0**	ug/m3	4.1	1.8	1.55		03/30/17 03:32	1330-20-7	
m&p-Xylene	**21.8**	ug/m3	2.7	1.2	1.55		03/30/17 03:32	179601-23-1	

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ANALYTICAL RESULTS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Sample: AOI2-AI-17-17 **Lab ID: 10382287016** Collected: 03/10/17 16:27 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
o-Xylene	**7.2**	ug/m3	1.4	0.54	1.55		03/30/17 03:32	95-47-6	

Sample: AOI2-AI-17-06 **Lab ID: 10382287017** Collected: 03/10/17 16:02 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**3.9**	ug/m3	0.52	0.20	1.61		03/30/17 04:00	71-43-2	
1,2-Dibromoethane (EDB)	**<1.2**	ug/m3	2.5	1.2	1.61		03/30/17 04:00	106-93-4	
1,2-Dichloroethane	**<0.33**	ug/m3	0.66	0.33	1.61		03/30/17 04:00	107-06-2	
Ethylbenzene	**15.1**	ug/m3	1.4	0.68	1.61		03/30/17 04:00	100-41-4	
Isopropylbenzene (Cumene)	**<0.22**	ug/m3	4.0	0.22	1.61		03/30/17 04:00	98-82-8	
Methyl-tert-butyl ether	**0.59J**	ug/m3	5.9	0.49	1.61		03/30/17 04:00	1634-04-4	
Naphthalene	**15.0**	ug/m3	4.3	0.49	1.61		03/30/17 04:00	91-20-3	
Toluene	**81.9**	ug/m3	1.2	0.25	1.61		03/30/17 04:00	108-88-3	
1,2,4-Trimethylbenzene	**13.9**	ug/m3	4.0	0.20	1.61		03/30/17 04:00	95-63-6	
1,3,5-Trimethylbenzene	**4.3**	ug/m3	1.6	0.29	1.61		03/30/17 04:00	108-67-8	
Xylene (Total)	**72.4**	ug/m3	4.3	1.8	1.61		03/30/17 04:00	1330-20-7	
m&p-Xylene	**58.4**	ug/m3	2.8	1.3	1.61		03/30/17 04:00	179601-23-1	
o-Xylene	**14.0**	ug/m3	1.4	0.57	1.61		03/30/17 04:00	95-47-6	

Sample: AOI3-AI-17-09 **Lab ID: 10382287018** Collected: 03/10/17 13:35 Received: 03/17/17 10:10 Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Benzene	**1.0**	ug/m3	0.44	0.16	1.34		03/29/17 20:05	71-43-2	
1,2-Dibromoethane (EDB)	**<1.0**	ug/m3	2.1	1.0	1.34		03/29/17 20:05	106-93-4	
1,2-Dichloroethane	**<0.27**	ug/m3	0.55	0.27	1.34		03/29/17 20:05	107-06-2	
Ethylbenzene	**<0.57**	ug/m3	1.2	0.57	1.34		03/29/17 20:05	100-41-4	
Isopropylbenzene (Cumene)	**<0.18**	ug/m3	3.4	0.18	1.34		03/29/17 20:05	98-82-8	
Methyl-tert-butyl ether	**0.48J**	ug/m3	4.9	0.41	1.34		03/29/17 20:05	1634-04-4	
Naphthalene	**1.6J**	ug/m3	3.6	0.41	1.34		03/29/17 20:05	91-20-3	
Toluene	**2.9**	ug/m3	1.0	0.21	1.34		03/29/17 20:05	108-88-3	
1,2,4-Trimethylbenzene	**1.1J**	ug/m3	3.3	0.17	1.34		03/29/17 20:05	95-63-6	
1,3,5-Trimethylbenzene	**0.46J**	ug/m3	1.3	0.25	1.34		03/29/17 20:05	108-67-8	
Xylene (Total)	**<1.5**	ug/m3	3.6	1.5	1.34		03/29/17 20:05	1330-20-7	
m&p-Xylene	**2.2J**	ug/m3	2.4	1.1	1.34		03/29/17 20:05	179601-23-1	
o-Xylene	**1.0J**	ug/m3	1.2	0.47	1.34		03/29/17 20:05	95-47-6	

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

QC Batch: 465212 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10382287001, 10382287002, 10382287003

METHOD BLANK: 2543547 | Matrix: Air
Associated Lab Samples: 10382287001, 10382287002, 10382287003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/22/17 20:54	
1,2-Dibromoethane (EDB)	ug/m3	<0.77	3.9	0.77	03/22/17 20:54	
1,2-Dichloroethane	ug/m3	<0.20	0.41	0.20	03/22/17 20:54	
1,3,5-Trimethylbenzene	ug/m3	<0.18	2.5	0.18	03/22/17 20:54	
Benzene	ug/m3	<0.12	0.32	0.12	03/22/17 20:54	
Ethylbenzene	ug/m3	<0.42	2.2	0.42	03/22/17 20:54	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/22/17 20:54	
m&p-Xylene	ug/m3	<0.79	4.4	0.79	03/22/17 20:54	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/22/17 20:54	
Naphthalene	ug/m3	<0.30	2.7	0.30	03/22/17 20:54	
o-Xylene	ug/m3	<0.35	2.2	0.35	03/22/17 20:54	
Toluene	ug/m3	<0.15	0.77	0.15	03/22/17 20:54	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/22/17 20:54	

LABORATORY CONTROL SAMPLE: 2543548

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	51.5	35.9	70	70-136	
1,2-Dibromoethane (EDB)	ug/m3	83.6	60.9	73	70-130	
1,2-Dichloroethane	ug/m3	44	40.9	93	70-130	
1,3,5-Trimethylbenzene	ug/m3	51.5	35.8	70	70-133	
Benzene	ug/m3	34.7	32.5	94	70-130	
Ethylbenzene	ug/m3	47.7	34.0	71	70-134	
Isopropylbenzene (Cumene)	ug/m3	51.5	36.8	71	70-140	
m&p-Xylene	ug/m3	47.7	35.7	75	70-130	
Methyl-tert-butyl ether	ug/m3	38.8	38.9	100	66-148	
Naphthalene	ug/m3	56	35.1	63	53-150	
o-Xylene	ug/m3	47.2	33.1	70	70-130	
Toluene	ug/m3	41.4	32.9	80	70-130	
Xylene (Total)	ug/m3	94.9	68.8	72	70-141	

SAMPLE DUPLICATE: 2543549

Parameter	Units	10382287001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	3.1J	3.2J		25	
1,2-Dibromoethane (EDB)	ug/m3	<1.5	<1.5		25	
1,2-Dichloroethane	ug/m3	<0.39	<0.39		25	
1,3,5-Trimethylbenzene	ug/m3	<0.34	<0.34		25	

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

SAMPLE DUPLICATE: 2543549

Parameter	Units	10382287001 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/m3	19.4	18.8	3	25	
Ethylbenzene	ug/m3	5.2	5.1	2	25	
Isopropylbenzene (Cumene)	ug/m3	<0.26	<0.26		25	
m&p-Xylene	ug/m3	19.9	19.8	1	25	
Methyl-tert-butyl ether	ug/m3	<0.57	<0.57		25	
Naphthalene	ug/m3	1.4J	<0.57		25	
o-Xylene	ug/m3	10.5	10.3	2	25	
Toluene	ug/m3	3.1	3.2	1	25	
Xylene (Total)	ug/m3	30.4	30.1	1		

SAMPLE DUPLICATE: 2543550

Parameter	Units	10382287002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	2.6J	2.6J		25	
1,2-Dibromoethane (EDB)	ug/m3	<1.2	<1.2		25	
1,2-Dichloroethane	ug/m3	<0.31	<0.31		25	
1,3,5-Trimethylbenzene	ug/m3	<0.27	<0.27		25	
Benzene	ug/m3	7.0	7.4	5	25	
Ethylbenzene	ug/m3	2.4J	2.5J		25	
Isopropylbenzene (Cumene)	ug/m3	<0.21	<0.21		25	
m&p-Xylene	ug/m3	6.2J	6.3J		25	
Methyl-tert-butyl ether	ug/m3	<0.45	<0.45		25	
Naphthalene	ug/m3	0.78J	<0.45		25	
o-Xylene	ug/m3	2.9J	2.8J		25	
Toluene	ug/m3	4.1	4.3	5	25	
Xylene (Total)	ug/m3	9.0	9.2	1		

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

QC Batch: 466173 | Analysis Method: TO-15
QC Batch Method: TO-15 | Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10382287004, 10382287005, 10382287006, 10382287007, 10382287008, 10382287009, 10382287010, 10382287011, 10382287012, 10382287013, 10382287014, 10382287015, 10382287016, 10382287017, 10382287018

METHOD BLANK: 2547889 | Matrix: Air
Associated Lab Samples: 10382287004, 10382287005, 10382287006, 10382287007, 10382287008, 10382287009, 10382287010, 10382287011, 10382287012, 10382287013, 10382287014, 10382287015, 10382287016, 10382287017, 10382287018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	<0.12	2.5	0.12	03/29/17 16:32	MN
1,2-Dibromoethane (EDB)	ug/m3	<0.77	1.6	0.77	03/29/17 16:32	
1,2-Dichloroethane	ug/m3	<0.20	0.41	0.20	03/29/17 16:32	
1,3,5-Trimethylbenzene	ug/m3	<0.18	1.0	0.18	03/29/17 16:32	
Benzene	ug/m3	<0.12	0.32	0.12	03/29/17 16:32	
Ethylbenzene	ug/m3	<0.42	0.88	0.42	03/29/17 16:32	
Isopropylbenzene (Cumene)	ug/m3	<0.14	2.5	0.14	03/29/17 16:32	
m&p-Xylene	ug/m3	<0.79	1.8	0.79	03/29/17 16:32	
Methyl-tert-butyl ether	ug/m3	<0.30	3.7	0.30	03/29/17 16:32	
Naphthalene	ug/m3	<0.30	2.7	0.30	03/29/17 16:32	
o-Xylene	ug/m3	<0.35	0.88	0.35	03/29/17 16:32	
Toluene	ug/m3	<0.15	0.77	0.15	03/29/17 16:32	
Xylene (Total)	ug/m3	<1.1	2.6	1.1	03/29/17 16:32	

LABORATORY CONTROL SAMPLE: 2547890

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	51.5	52.1	101	70-136	
1,2-Dibromoethane (EDB)	ug/m3	83.6	77.7	93	70-130	
1,2-Dichloroethane	ug/m3	44	43.6	99	70-130	
1,3,5-Trimethylbenzene	ug/m3	51.5	53.1	103	70-133	
Benzene	ug/m3	34.7	34.0	98	70-130	
Ethylbenzene	ug/m3	47.7	46.0	96	70-134	
Isopropylbenzene (Cumene)	ug/m3	51.5	54.8	107	70-140	
m&p-Xylene	ug/m3	47.7	46.4	97	70-130	
Methyl-tert-butyl ether	ug/m3	38.8	35.6	92	66-148	
Naphthalene	ug/m3	56	63.2	113	53-150	
o-Xylene	ug/m3	47.2	44.7	95	70-130	
Toluene	ug/m3	41.4	36.4	88	70-130	
Xylene (Total)	ug/m3	94.9	91.2	96	70-141	

SAMPLE DUPLICATE: 2548339

Parameter	Units	10382287007 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	0.72J	0.62J		25	

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QUALITY CONTROL DATA

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

SAMPLE DUPLICATE: 2548339

Parameter	Units	10382287007 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dibromoethane (EDB)	ug/m3	<1.2	<1.2		25	
1,2-Dichloroethane	ug/m3	<0.32	<0.32		25	
1,3,5-Trimethylbenzene	ug/m3	<0.28	<0.28		25	
Benzene	ug/m3	6.2	6.2	1	25	
Ethylbenzene	ug/m3	<0.66	<0.66		25	
Isopropylbenzene (Cumene)	ug/m3	<0.21	<0.21		25	
m&p-Xylene	ug/m3	1.5J	1.4J		25	
Methyl-tert-butyl ether	ug/m3	0.55J	0.50J		25	
Naphthalene	ug/m3	1.0J	0.85J		25	
o-Xylene	ug/m3	0.67J	0.66J		25	
Toluene	ug/m3	3.3	3.2	2	25	
Xylene (Total)	ug/m3	<1.8	<1.8			

SAMPLE DUPLICATE: 2548340

Parameter	Units	10382287010 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/m3	6.9	7.1	3	25	
1,2-Dibromoethane (EDB)	ug/m3	<1.2	<1.2		25	
1,2-Dichloroethane	ug/m3	<0.31	<0.31		25	
1,3,5-Trimethylbenzene	ug/m3	1.7	1.6	2	25	
Benzene	ug/m3	0.48J	0.54		25	
Ethylbenzene	ug/m3	<0.63	<0.63		25	
Isopropylbenzene (Cumene)	ug/m3	<0.21	<0.21		25	
m&p-Xylene	ug/m3	1.3J	1.4J		25	
Methyl-tert-butyl ether	ug/m3	0.46J	<0.45		25	
Naphthalene	ug/m3	1.4J	1.2J		25	
o-Xylene	ug/m3	0.94J	0.91J		25	
Toluene	ug/m3	3.6	3.5	2	25	
Xylene (Total)	ug/m3	<1.7	<1.7			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11109626 Evergreen PES
Pace Project No.: 10382287

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10382287001	**AOI5-AI-17-01**	TO-15	465212		
10382287002	**AOI5-AI-17-02**	TO-15	465212		
10382287003	**AOI5-AI-17-03**	TO-15	465212		
10382287004	**AOI5-AI-17-04**	TO-15	466173		
10382287005	**AOI5-AI-17-06**	TO-15	466173		
10382287006	**AOI5-AI-17-05**	TO-15	466173		
10382287007	**AOI5-AI-17-07**	TO-15	466173		
10382287008	**AOI6-AI-17-22**	TO-15	466173		
10382287009	**AOI2-AI-17-01**	TO-15	466173		
10382287010	**AOI2-AI-17-08**	TO-15	466173		
10382287011	**AOI2-AI-17-10**	TO-15	466173		
10382287012	**AOI2-AI-17-03**	TO-15	466173		
10382287013	**AOI2-AI-17-07**	TO-15	466173		
10382287014	**AOI2-AI-17-04**	TO-15	466173		
10382287015	**AOI2-AI-17-16**	TO-15	466173		
10382287016	**AOI2-AI-17-17**	TO-15	466173		
10382287017	**AOI2-AI-17-06**	TO-15	466173		
10382287018	**AOI3-AI-17-09**	TO-15	466173		

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www.pacelabs.com

AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10382287

26303

Section A Required Client Information:

Company: GHD
Address: 410 Eagleview Blvd Suite 110
Exton, Pennsylvania
Email To: David.Steele
Phone: (610-321-1280) Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Steele
Copy To: Paul McMahon
Purchase Order No.:
Project Name: Evergreen PES
Project Number: 11109626

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other____

Location of Sampling by State _____

Reporting Units: ug/m³___ mg/m³___ PPBV___ PPMV___ Other___

Report Level II.___ III.___ IV.___ Other___

Valid Media Codes: MEDIA / CODE — Tedlar Bag TB; 1 Liter Summa Can 1LC; 6 Liter Summa Can 6LC; Low Volume Puff LVP; High Volume Puff HVP; Other PM10

ITEM #	'Section D Required Client Information AIR SAMPLE ID (Sample IDs MUST BE UNIQUE)	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START END/GRAB DATE	TIME	COMPOSITE - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	PM10	3C- Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14	TO-15	TO15 Short List*	Pace Lab ID
1	AOI5-AI-17-01			03-10-17	0641	03-10-17	1442	-30+	-4	832	0532									X	001
2	AOI5-AI-17-02			03-10-17	0707	03-10-17	1507	-30+	-4	108	0224									X	002
3	AOI5-AI-17-03			03-10-17	0650	03-10-17	1450	-30+	-5	92	1060									X	003
4	AOI5-AI-17-04			03-10-17	0645	03-10-17	1446	-29	-5	1250	1035									X	004
5	AOI5-AI-17-06			03-10-17	0704	03-10-17	1504	-30+	-5	85	1016									X	005
6	AOI5-AI-17-05			03-10-17	0632	03-10-17	1435	-30+	-4	2017	0105									X	006
7	AOI5-AI-17-07			03-10-17	0644	03-10-17	1444	-27+	-4	2042	0370									X	007
8	AOI6-AI-17-02			03-08-17	0919	03-08-17	1712	-30+	0.0	854	2122									X	008
9	AOI2-AI-17-01			~~03-08-17~~ 03-10-17	0730	03-10-17	1530	-30	-16+	143	0407									X	009
10	AOI2-AI-17-08			03-10-17	0748	03-10-17	1611	-29	-3	1207	1079									X	010
11	AOI2-AI-17-10			03-10-17	0742	03-10-17	1542	-29	-4	1044	1063									X	011
12	AOI2-AI-17-03			03-10-17	0758	03-10-17	1558	-285	-4+	86	0435									X	012

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	3/13/17	1345	[signature]	3/13/17	1345
[signature]	3/17/17	1445	[signature]	3/17/17	1010

SAMPLE CONDITIONS

Temp in °C	Received on Ice Y/N	Custody Sealed Cooler Y/N	Samples Intact Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

ORIGINAL

Pace Analytical®
www.pacelabs.com

AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

26264

Section A Required Client Information:

Company: GHD
Address: 410 Eagleview Blvd Suite 110
Exton, Pennsylvania
Email To:
Phone: 610-321-4800 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: David Steele
Copy To: Paul McMahon
Purchase Order No.:
Project Name: Evergreen PES
Project Number: 111096276

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep.
Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other____

Location of Sampling by State _____

Reporting Units: ug/m³___ mg/m³___ PPBV___ PPMV___ Other___

Report Level II.___ III.___ IV.___ Other_____

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	'Section D Required Client Information AIR SAMPLE ID (Sample IDs MUST BE UNIQUE)	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START END/GRAB DATE	TIME	COMPOSITE - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	Method: PM10	3C: Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14	TO-15	TO15 Short List*	Pace Lab ID
1	~~AOI1-AI~~ AOI1-01			031017		031017														X	Do Not Analyze
2	~~AOI2-AI-17-08~~																				AE
3	AOI2-AI-17-07			031017	0707	031017	1607	-28	-6	2673	00096									X	013
4	AOI2-AI-1704			031017	0755	031017	1555	-30	-5	117	00060									X	014
5	AOI2-AI-17-16			031017	0821	031017	1621	-24	-3	1265	00243									X	015
6	AOI2-AI-17-17			031017	0827	031017	1627	-29	-7+	2391	00324									X	016
7	AOI2-AI-17-06			031017	0802	031017	1602	-30+	-5	1061	01276									X	017
8	AOI3-AI-17-09			031017	0604	031017	1335	-27	0.0	3403	00207									X	018
9																					
10																					
11																					
12																					

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	3/13/17	1345	[signature]	3/13/17	1345
[signature]	3/13/17	1435	[signature]	3/13/17	1010

SAMPLE CONDITIONS

Temp in °C	Y/N	Y/N	Y/N
Received on Ice	Y/N	Y/N	Y/N
Custody Sealed Cooler	Y/N	Y/N	Y/N
Samples Intact	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

ORIGINAL

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 26APR2016 Page 1 of 1
	Document No.: F-MN-A-106-rev.11	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: GHD

Project #: **WO# : 10382287**

10382287

Courier: [X] Fed Ex [ ] UPS [ ] Speedee [ ] Client [ ] Commercial [ ] Pace [ ] Other:

Tracking Number: 78 589924 2083, 2061, 2050, 2040, 2039, 2072, 78589466 2671, 2719, 2708, 2682, 2693

Optional: Proj. Due Date: Proj. Name:

Custody Seal on Cooler/Box Present? [ ] Yes [X] No Seals Intact? [ ] Yes [X] No

Packing Material: [ ] Bubble Wrap [ ] Bubble Bags [X] Foam [ ] None [ ] Tin Can [ ] Other: Temp Blank rec: [ ] Yes [X] No

Temp. (TO17 and TO13 samples only) (°C): — Corrected Temp (°C): — Thermom. Used: [ ] B88A912167504 [ ] B88A0143310098 [ ] 151401163 [ ] 151401164

Temp should be above freezing to 6°C Correction Factor: — Date & Initials of Person Examining Contents: EJL 3/17/17

Type of ice Received [ ] Blue [ ] Wet [X] None

				Comments:
Chain of Custody Present?	[X] Yes	[ ] No	[ ] N/A	1.
Chain of Custody Filled Out?	[X] Yes	[ ] No	[ ] N/A	2.
Chain of Custody Relinquished?	[X] Yes	[ ] No	[ ] N/A	3.
Sampler Name and/or Signature on COC?	[X] Yes	[ ] No	[ ] N/A	4.
Samples Arrived within Hold Time?	[X] Yes	[ ] No	[ ] N/A	5.
Short Hold Time Analysis (<72 hr)?	[ ] Yes	[X] No	[ ] N/A	6.
Rush Turn Around Time Requested?	[ ] Yes	[X] No	[ ] N/A	7.
Sufficient Volume?	[X] Yes	[ ] No	[ ] N/A	8.
Correct Containers Used?	[X] Yes	[ ] No	[ ] N/A	9.
-Pace Containers Used?	[X] Yes	[ ] No	[ ] N/A	
Containers Intact?	[X] Yes	[ ] No	[ ] N/A	10.
Media: Air Can Airbag Filter TDT Passive				11.
Sample Labels Match COC?	[ ] Yes	[X] No	[ ] N/A	12. NO ID/Date/Time on cans

Samples Received:

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
A0I5-AI-17-01	822		A0I2-AI-17-10		
* 11-02			* 11-03		
* 11-03			A0I1-01 EJL 3/10		
11-04			A0I2-AI-17-07		
11-05			* 11-04		
* 11-06			11-16		
11-07			11-17		
* A0I6-AI-17-22		*	11-06		
* A0I2-AI-17-01			* A0I3-AI-17-09		*
11-08					

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? [ ] Yes [ ] No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Date:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 26APR2016 Page 1 of 1
	Document No.: F-MN-A-106-rev.11	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: _____ **Project #:**

Courier: ☐Fed Ex ☐UPS ☐Speedee ☐Client ☐Commercial ☐Pace ☐Other:_____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐Yes ☐No **Seals Intact?** ☐Yes ☐No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☐Foam ☐None ☐Tin Can ☐Other:_____ **Temp Blank rec:** ☐Yes ☐No

Temp. (TO17 and TO13 samples only) (°C): _____ **Corrected Temp (°C):** _____ **Thermom. Used:** ☐B88A912167504 ☐B88A0143310098 ☐151401163 ☐151401164

Temp should be above freezing to 6°C **Correction Factor:** _____ **Date & Initials of Person Examining Contents:** _____

Type of ice Received ☐Blue ☐Wet ☐None

				Comments:
Chain of Custody Present?	☐Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☐Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☐Yes	☐No	☐N/A	3.
Sampler Name and/or Signature on COC?	☐Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☐Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☐No	☐N/A	6.
Rush Turn Around Time Requested?	☐Yes	☐No	☐N/A	7.
Sufficient Volume?	☐Yes	☐No	☐N/A	8.
Correct Containers Used?	☐Yes	☐No	☐N/A	9.
-Pace Containers Used?	☐Yes	☐No	☐N/A	
Containers Intact?	☐Yes	☐No	☐N/A	10.
Media: Air Can Airbag Filter TDT Passive				11.
Sample Labels Match COC?	☐Yes	☐No	☐N/A	12.

Samples Received:

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
Unused	Pace0852	0067			
"	0102	0069			
"	0098				
"	0096				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Nathan Boberg **Date:** 3/20/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: March 21, 2017

Project: Philadelphia Refinery

Submittal Date: 03/09/2017
Group Number: 1775150
SDG: MHF80
PO Number: 11109626
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-AI-17-20 Air	8876946
AOI6-AI-17-08 Air	8876947
AOI6-AI-17-01 Air	8876948
AOI6-AI-17-03 Air	8876949
AOI6-AI-17-02 Air	8876950
AOI6-AI-17-07 Air	8876951
AOI6-AI-17-18 Air	8876952
AOI6-AI-17-04 Air	8876953
AOI6-AA-17-02 Air	8876954
AOI6-AA-17-01 Air	8876955
AOI6-AI-17-21 Air	8876956
AOI6-AI-17-17 Air	8876957
AOI6-AI-17-19 Air	8876958

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

eurofins
Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-AI-17-20 Air
SUMMA# 1336
Philadelphia Refinery

LL Sample # AQ 8876946
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 08:34 by AC
through 03/08/2017 16:34
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

17-20 SDG#: MHF80-01

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	6.7		1.0	21		3.2	1
05298	Cumene	98-82-8	6.9		1.0	34		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	0.26	J	1.0	1.1	J	4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.71	J	1.0	2.7	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	0.39	J	1.0	1.9	J	4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	1.1		1.0	4.7		4.3	1
05298	o-Xylene	95-47-6	0.52	J	1.0	2.2	J	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 01:28	Jacob E Bailey	1

eurofins
Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-AI-17-08 Air
SUMMA# 1037
Philadelphia Refinery

LL Sample # AQ 8876947
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 08:12 by AC
through 03/08/2017 16:12
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

17-08 SDG#: MHF80-02

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	1.3		1.0	4.3		3.2	1
05298	Cumene	98-82-8	62		10	310		49	10
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.65	J	1.0	2.4	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	0.25	J	1.0	1.2	J	4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.65	J	1.0	2.8	J	4.3	1
05298	o-Xylene	95-47-6	0.23	J	1.0	1.0	J	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 02:55	Jacob E Bailey	1
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707630AA	03/17/2017 16:13	Jacob E Bailey	10

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Lancaster Laboratories Environmental
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Analysis Report

Sample Description: AOI6-AI-17-01 Air
SUMMA# 527
Philadelphia Refinery

LL Sample # AQ 8876948
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 09:11 by AC
through 03/08/2017 17:13
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

17-01 SDG#: MHF80-03

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	2.2		1.0	6.9		3.2	1
05298	Cumene	98-82-8	0.68	J	1.0	3.3	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	1.8		1.0	9.6		5.2	1
05298	Toluene	108-88-3	0.99	J	1.0	3.7	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.48	J	1.0	2.1	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 03:39	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-03 Air
SUMMA# 1378
Philadelphia Refinery

LL Sample # AQ 8876949
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 09:19 by AC
through 03/08/2017 17:23
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

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Suite #3
Niagara Falls NY 14304

17-03 SDG#: MHF80-04

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	2.2		1.0	7.1		3.2	1
05298	Cumene	98-82-8	0.47	J	1.0	2.3	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	0.23	J	1.0	1.0	J	4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	1.0		1.0	3.9		3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.50	J	1.0	2.2	J	4.3	1
05298	o-Xylene	95-47-6	0.23	J	1.0	0.98	J	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 04:23	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-02 Air
SUMMA# 1387
Philadelphia Refinery

LL Sample # AQ 8876950
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 09:29 by AC
through 03/08/2017 17:33
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

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17-02 SDG#: MHF80-05

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	2.1		1.0	6.8		3.2	1
05298	Cumene	98-82-8	0.43	J	1.0	2.1	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	0.21	J	1.0	0.93	J	4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	1.4		1.0	5.2		3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.62	J	1.0	2.7	J	4.3	1
05298	o-Xylene	95-47-6	0.24	J	1.0	1.0	J	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 05:07	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-07 Air
SUMMA# 1411
Philadelphia Refinery

LL Sample # AQ 8876951
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 09:50 by AC
through 03/08/2017 17:50
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

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Niagara Falls NY 14304

17-07 SDG#: MHF80-06

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	1.9		1.0	6.2		3.2	1
05298	Cumene	98-82-8	0.53	J	1.0	2.6	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.94	J	1.0	3.6	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.47	J	1.0	2.1	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 05:51	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-18 Air
SUMMA# 1472
Philadelphia Refinery

LL Sample # AQ 8876952
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 08:18 by AC
through 03/08/2017 16:20
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

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17-18 SDG#: MHF80-07

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	3.2		1.0	10		3.2	1
05298	Cumene	98-82-8	3.1		1.0	15		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.65	J	1.0	2.5	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.28	J	1.0	1.2	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 06:35	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-04 Air
SUMMA# 1228
Philadelphia Refinery

LL Sample # AQ 8876953
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 09:40 by AC
through 03/08/2017 17:40
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
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17-04 SDG#: MHF80-08

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	2.0		1.0	6.4		3.2	1
05298	Cumene	98-82-8	0.30	J	1.0	1.5	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.80	J	1.0	3.0	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.37	J	1.0	1.6	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707530AA	03/17/2017 07:18	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AA-17-02 Air
SUMMA# 1521
Philadelphia Refinery

LL Sample # AQ 8876954
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 10:30 by AC
through 03/08/2017 18:30
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

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Niagara Falls NY 14304

A1702 SDG#: MHF80-09

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	2.6		1.0	8.4		3.2	1
05298	Cumene	98-82-8	0.35	J	1.0	1.7	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.67	J	1.0	2.5	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.28	J	1.0	1.2	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707630AA	03/17/2017 16:57	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AA-17-01 Air
SUMMA# 1179
Philadelphia Refinery

LL Sample # AQ 8876955
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 09:30 by AC
through 03/08/2017 17:30
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
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Niagara Falls NY 14304

A1701 SDG#: MHF80-10

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	0.95	J	1.0	3.0	J	3.2	1
05298	Cumene	98-82-8	N.D.		1.0	N.D.		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.34	J	1.0	1.3	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	N.D.		1.0	N.D.		4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707630AA	03/17/2017 17:41	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-21 Air
SUMMA# 1189
Philadelphia Refinery

LL Sample # AQ 8876956
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 10:06 by AC
through 03/08/2017 16:06
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
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Suite #3
Niagara Falls NY 14304

17-21 SDG#: MHF80-11

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	1.6		1.0	5.0		3.2	1
05298	Cumene	98-82-8	0.49	J	1.0	2.4	J	4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.71	J	1.0	2.7	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.31	J	1.0	1.4	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

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Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707630AA	03/17/2017 18:24	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-17 Air
SUMMA# 1245
Philadelphia Refinery

LL Sample # AQ 8876957
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 07:53 by AC
through 03/08/2017 15:57
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

17-17 SDG#: MHF80-12

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	0.38	J	1.0	1.2	J	3.2	1
05298	Cumene	98-82-8	N.D.		1.0	N.D.		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.37	J	1.0	1.4	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.22	J	1.0	0.96	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707630AA	03/17/2017 19:08	Jacob E Bailey	1

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Analysis Report

Sample Description: AOI6-AI-17-19 Air
SUMMA# 831
Philadelphia Refinery

LL Sample # AQ 8876958
LL Group # 1775150
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/08/2017 08:24 by AC
through 03/08/2017 16:24
Submitted: 03/09/2017 19:50
Reported: 03/21/2017 14:26

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

17-19 SDG#: MHF80-13

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	0.27	J	1.0	0.86	J	3.2	1
05298	Cumene	98-82-8	N.D.		1.0	N.D.		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.29	J	1.0	1.1	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	N.D.		1.0	N.D.		4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1707630AA	03/17/2017 19:52	Jacob E Bailey	1

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 03/21/2017 14:26

Group Number: 1775150

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppb(v)	LOQ ppb(v)	Result ug/m3	LOQ ug/m3
Batch number: E1707530AA	Sample number(s): 8876946-8876953			
Benzene	N.D.	1.0	N.D.	3.2
Cumene	N.D.	1.0	N.D.	4.9
1,2-Dibromoethane	N.D.	1.0	N.D.	7.7
1,2-Dichloroethane	N.D.	1.0	N.D.	4.0
Ethylbenzene	N.D.	1.0	N.D.	4.3
Methyl t-Butyl Ether	N.D.	1.0	N.D.	3.6
Naphthalene	N.D.	1.0	N.D.	5.2
Toluene	N.D.	1.0	N.D.	3.8
1,2,4-Trimethylbenzene	N.D.	1.0	N.D.	4.9
1,3,5-Trimethylbenzene	N.D.	1.0	N.D.	4.9
m/p-Xylene	N.D.	1.0	N.D.	4.3
o-Xylene	N.D.	1.0	N.D.	4.3
Batch number: E1707630AA	Sample number(s): 8876947,8876954-8876958			
Benzene	N.D.	1.0	N.D.	3.2
Cumene	N.D.	1.0	N.D.	4.9
1,2-Dibromoethane	N.D.	1.0	N.D.	7.7
1,2-Dichloroethane	N.D.	1.0	N.D.	4.0
Ethylbenzene	N.D.	1.0	N.D.	4.3
Methyl t-Butyl Ether	N.D.	1.0	N.D.	3.6
Naphthalene	N.D.	1.0	N.D.	5.2
Toluene	N.D.	1.0	N.D.	3.8
1,2,4-Trimethylbenzene	N.D.	1.0	N.D.	4.9
1,3,5-Trimethylbenzene	N.D.	1.0	N.D.	4.9
m/p-Xylene	N.D.	1.0	N.D.	4.3
o-Xylene	N.D.	1.0	N.D.	4.3

LCS/LCSD

Analysis Name	LCS Spike Added ppb(v)	LCS Conc ppb(v)	LCSD Spike Added ppb(v)	LCSD Conc ppb(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: E1707530AA	Sample number(s): 8876946-8876953								
Benzene	10	11.7	10	12.12	117	121	76-123	3	25
Cumene	10	10.91	10	10.96	109	110	74-121	0	25
1,2-Dibromoethane	10	11.57	10	11.45	116	114	73-121	1	25
1,2-Dichloroethane	10	12.09	10	12.52	121	125	72-138	3	25

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 03/21/2017 14:26

Group Number: 1775150

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ppb(v)	LCS Conc ppb(v)	LCSD Spike Added ppb(v)	LCSD Conc ppb(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Ethylbenzene	10	11.07	10	10.85	111	109	77-117	2	25
Methyl t-Butyl Ether	10	10.29	10	10.6	103	106	71-119	3	25
Naphthalene	10	11.74	10	11.61	117	116	39-152	1	25
Toluene	10	11.65	10	11.45	116	114	78-119	2	25
1,2,4-Trimethylbenzene	10	12.14	10	11.87	121	119	70-138	2	25
1,3,5-Trimethylbenzene	10	11.38	10	10.98	114	110	72-130	4	25
m/p-Xylene	10	10.98	10	10.94	110	109	78-119	0	25
o-Xylene	10	10.66	10	10.54	107	105	78-121	1	25
Batch number: E1707630AA	Sample number(s): 8876947,8876954-8876958								
Benzene	10	12.13	10	12.11	121	121	76-123	0	25
Cumene	10	10.92	10	10.73	109	107	74-121	2	25
1,2-Dibromoethane	10	11.63	10	11.49	116	115	73-121	1	25
1,2-Dichloroethane	10	12.64	10	12.54	126	125	72-138	1	25
Ethylbenzene	10	10.95	10	11.05	110	110	77-117	1	25
Methyl t-Butyl Ether	10	10.66	10	10.89	107	109	71-119	2	25
Naphthalene	10	11.71	10	11.87	117	119	39-152	1	25
Toluene	10	11.7	10	11.56	117	116	78-119	1	25
1,2,4-Trimethylbenzene	10	11.82	10	11.84	118	118	70-138	0	25
1,3,5-Trimethylbenzene	10	11.18	10	10.79	112	108	72-130	4	25
m/p-Xylene	10	11.12	10	11.12	111	111	78-119	0	25
o-Xylene	10	10.7	10	10.71	107	107	78-121	0	25

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 10177 Group # 1775150 Sample # 8876946-58 Bottle Order (SCR) # _____

Client Information

Client: GHD
Account #:
Project Name/#: Evergreen PES 11109626
Project Manager: David Steele
P.O. #:
Sampler: A. Cannon, K. Curry
Quote #:
Name of state where samples were collected: Pennsylvania

Turnaround Time Requested (TAT) (circle one)

Standard Rush (specify) _____

Data Package Required? Yes No

EDD Required? Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	52			
Maximum	~~62~~ 63			
Minimum				

Analyses Requested

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18 ☐ BTEX ☐ MTBE	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
AOI6-AI-17-20	03/08/17 0834	03/08/17 1634	-30	-1	68.7	73.8	675024	1336	6	10.4						
AOI6-AI-17-05	03/08/17 0804	03/08/17	-24.0		74.2		958169	1232	6	10.6	Do not analyze					
AOI6-AI-17-08	03/08/17 0812	03/08/17 1612	-29+	-5	66.1	75.4	900087	1037	6	10.4						
AOI6-AI-17-01	03/08/17 0911	03/08/17 1713	-29.5	-4.5	74.6	77.7	958077	527	6	10.3						
AOI6-AI-17-03	03/08/17 0919	03/08/17 1723	-29.5	~~-5.5~~ -4 AC	74.2	78.9	675037	1378	6	10.3						
AOI6-AI-17-02	03/08/17 0929	03/08/17 1733	-30.0	-5.5	73.5	81.0	840487	1387	6	10.6						
AOI6-AI-17-07	03/08/17 0950	03/08/17 1750	-30.0	-5	74.1	76.2	966894	1411	6	10.6						
AOI6-AI-17-18	03/08/17 0818	03/08/17 1620	-30.0	-4	72.0		824845	1472	6	10.5						
AOI6-AI-17-04	03/08/17 0940	03/08/17 1740	-29.5	-5	71.3	79.5	701140	1228	6	10.4						
AOI6-AA-17-02	03/08/17 1030	03/08/17 1830	-30	-6	out RL 55	62.3	966896	1521	6	10.5						
							~~152710~~	~~833~~	~~6~~	~~10.4~~	AC					

Instructions/QC Requirements & Comments

PES/Philadelphia Database

EPA 25 (check one)
☐ C1 - C4 ☐ C2 - C10
☐ C1 - C10 ☐ C4 - C10 (GRO)
☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
[signature] 3/6/17	17:51						
Relinquished by: [signature]	Date/Time: 03/09/17	Received by: [signature]	Date/Time: 3/9/17 1353	Relinquished by: [signature]	Date/Time: 3/9/17 1950	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 3.9.17 1950

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.
7056 1015
Page 18 of 22

Summa Canister Field Test Data/Chain of Custody

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Acct. # 10177 Group # 1775150 Sample # 8876946-58 Bottle Order (SCR) # _____

Client Information

Client: GHD

Account #:

Project Name/#: Evergreen PES 11609626

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon K Curry

Quote #:

Name of state where samples were collected: Pennsylvania

Turnaround Time Requested (TAT) (circle one)

Standard Rush (specify) _____

Data Package Required? Yes No

EDD Required? Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	52			
Maximum				
Minimum				

Analyses Requested

☐ MTBE ☐ BTEX

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
~~[illegible]~~							~~910568~~	~~1395~~	~~6~~	~~10.5~~	AC					
AOI6-AA-17-01	03/08/17 0930	03/08/17 1730	-30	-4	03/08/17 54.8	64.4	248310	1179	6	10.6						
AOI6-AI-17-21	03/08/17 1006	03/08/17 1646	-29.4	-4	67.0	70.6	900011	1189	6	10.3						
AOI6-AI-17-17	03/08/17 0753	03/08/17 1557	-30.0	-9	72.7	77.6	344045	1245	6	10.5						
AOI6-AI-17-19	03/08/17 0824	03/08/17 1624	-29.0	-1	68.3	72.7	710538	831	6	10.4						

Instructions/QC Requirements & Comments

PES / Philadelphia Database

EPA 25 (check one) ☐ C1 - C4 ☐ C2 - C10 ☐ C1 - C10 ☐ C4 - C10 (GRO) ☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
[signature] 3/6/17	17:51						
Relinquished by: [signature] 03/09/17	Date/Time:	Received by: [signature]	3/9/17 1353	Relinquished by: [signature]	3/9/17 1950	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by: [signature]	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 3-9-17 1950

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Sample Administration Receipt Documentation Log

Doc Log ID: 177674

Group Number(s): 1775150

Client: GHD

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	03/09/2017 19:50
Number of Packages:	5	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	Yes
Extra Samples:	No	Flow Controller Quantity:	14
Discrepancy in Container Qty on COC:	No	Air Quality Returns:	Yes
		Summa Canisters:	1232

Unpacked by Timothy Cubberley (6520) at 05:35 on 03/10/2017

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Additional Data Qualifiers

Qualifier	Definition
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

Report Date: March 27, 2017

Project: Philadelphia Refinery

Submittal Date: 03/17/2017
Group Number: 1777963
SDG: MHF81
PO Number: 11109626
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
AOI6-AI-17-15 Air	8889684
AOI6-AA-17-01 Air	8889685

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	GHD, Inc.	Attn: Dave Steele
Electronic Copy To	GHD	Attn: Paul McMahon

Respectfully Submitted,

Megan A. Moeller
Senior Specialist

(717) 556-7261

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Analysis Report

Sample Description: AOI6-AI-17-15 Air
SUMMA# 333
Philadelphia Refinery

LL Sample # AQ 8889684
LL Group # 1777963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/09/2017 07:41 by DY
through 03/09/2017 14:55
Submitted: 03/17/2017 16:25
Reported: 03/27/2017 16:28

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

EVR01 SDG#: MHF81-01

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	1.1		1.0	3.6		3.2	1
05298	Cumene	98-82-8	N.D.		1.0	N.D.		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	N.D.		1.0	N.D.		4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	0.52	J	1.0	2.0	J	3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.28	J	1.0	1.2	J	4.3	1
05298	o-Xylene	95-47-6	N.D.		1.0	N.D.		4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1708330AA	03/25/2017 03:16	Jacob E Bailey	1

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Lancaster Laboratories Environmental
2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: AOI6-AA-17-01 Air
SUMMA# 1395
Philadelphia Refinery

LL Sample # AQ 8889685
LL Group # 1777963
Account # 10177

Project Name: Philadelphia Refinery

Collected: 03/09/2017 07:26 by DY
through 03/09/2017 15:40
Submitted: 03/17/2017 16:25
Reported: 03/27/2017 16:28

Evergreen c/o GHD
2055 Niagara Falls Blvd.
Suite #3
Niagara Falls NY 14304

EVR02 SDG#: MHF81-02

CAT No.	Analysis Name	CAS Number	Final Result		LOQ	Final Result		LOQ	DF
Volatiles in Air	**EPA TO-15**		ppb(v)		ppb(v)	ug/m3		ug/m3	
05298	Benzene	71-43-2	0.64	J	1.0	2.0	J	3.2	1
05298	Cumene	98-82-8	N.D.		1.0	N.D.		4.9	1
05298	1,2-Dibromoethane	106-93-4	N.D.		1.0	N.D.		7.7	1
05298	1,2-Dichloroethane	107-06-2	N.D.		1.0	N.D.		4.0	1
05298	Ethylbenzene	100-41-4	0.21	J	1.0	0.89	J	4.3	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.		1.0	N.D.		3.6	1
05298	Naphthalene	91-20-3	N.D.		1.0	N.D.		5.2	1
05298	Toluene	108-88-3	1.4		1.0	5.5		3.8	1
05298	1,2,4-Trimethylbenzene	95-63-6	N.D.		1.0	N.D.		4.9	1
05298	1,3,5-Trimethylbenzene	108-67-8	N.D.		1.0	N.D.		4.9	1
05298	m/p-Xylene	n.a.	0.73	J	1.0	3.2	J	4.3	1
05298	o-Xylene	95-47-6	0.27	J	1.0	1.2	J	4.3	1

LOQ = Limit of Quantitation

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/18.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
05298	TO 15 VOA Ext. List	EPA TO-15	1	E1708330AA	03/25/2017 04:00	Jacob E Bailey	1

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 03/27/2017 16:28

Group Number: 1777963

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppb(v)	LOQ ppb(v)	Result ug/m3	LOQ ug/m3
Batch number: E1708330AA	Sample number(s): 8889684-8889685			
Benzene	N.D.	1.0	N.D.	3.2
Cumene	N.D.	1.0	N.D.	4.9
1,2-Dibromoethane	N.D.	1.0	N.D.	7.7
1,2-Dichloroethane	N.D.	1.0	N.D.	4.0
Ethylbenzene	N.D.	1.0	N.D.	4.3
Methyl t-Butyl Ether	N.D.	1.0	N.D.	3.6
Naphthalene	N.D.	1.0	N.D.	5.2
Toluene	N.D.	1.0	N.D.	3.8
1,2,4-Trimethylbenzene	N.D.	1.0	N.D.	4.9
1,3,5-Trimethylbenzene	N.D.	1.0	N.D.	4.9
m/p-Xylene	N.D.	1.0	N.D.	4.3
o-Xylene	N.D.	1.0	N.D.	4.3

LCS/LCSD

Analysis Name	LCS Spike Added ppb(v)	LCS Conc ppb(v)	LCSD Spike Added ppb(v)	LCSD Conc ppb(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: E1708330AA	Sample number(s): 8889684-8889685								
Benzene	10	10.52	10	10.46	105	105	76-123	1	25
Cumene	10	9.77	10	10.0	98	100	74-121	2	25
1,2-Dibromoethane	10	10.24	10	10.29	102	103	73-121	1	25
1,2-Dichloroethane	10	10.42	10	10.31	104	103	72-138	1	25
Ethylbenzene	10	9.85	10	10.1	99	101	77-117	2	25
Methyl t-Butyl Ether	10	10.22	10	10.32	102	103	71-119	1	25
Naphthalene	10	7.64	10	8.24	76	82	39-152	8	25
Toluene	10	9.87	10	10.15	99	101	78-119	3	25
1,2,4-Trimethylbenzene	10	9.44	10	9.59	94	96	70-138	1	25
1,3,5-Trimethylbenzene	10	9.55	10	9.80	95	98	72-130	3	25
m/p-Xylene	10	9.67	10	9.83	97	98	78-119	2	25
o-Xylene	10	9.82	10	10.19	98	102	78-121	4	25

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Evergreen c/o GHD
Reported: 03/27/2017 16:28

Group Number: 1777963

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # ~~06225~~ 10177 ③ 5/6/17 3/18/17 Group # 1777963 Sample # 8889684-8889685 Bottle Order (SCR) # _____

Client Information

Client: GHD
Account #:
Project Name/#: Evergreen PES
Project Manager: David Steele
P.O. #:
Sampler: Donovan Young
Quote #:
Name of state where samples were collected: Pennsylvania

Turnaround Time Requested (TAT) (circle one)

Standard Rush (specify) _____

Data Package Required? Yes No

EDD Required? Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	50	69.7		
Maximum	~~69.7~~			
Minimum				

Analyses Requested

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18 ☐ BTEX ☐ MTBE	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
AOI6-AI-17-15	03/09/17 0741	03/09/17 1455	-30	0.0	70.0	67	152710	333	6							
AOI3 AA-17-01	03/09/17 0726	03/09/17 1540	-30	0.0	58.3	–	710568	1395	6							

Instructions/QC Requirements & Comments

PES Philadelphia Database

EPA 25 (check one)
☐ C1 - C4 ☐ C2 - C10
☐ C1 - C10 ☐ C4 - C10 (GRO)
☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
				[signature]	3/17/17		
Relinquished by: [signature] 03/09/17	Date/Time: 17:00	Received by: [signature]	Date/Time: 3-17-17	Relinquished by: [signature]	Date/Time: 3-17-17 1625	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 3-17-17

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7625
7056 1015

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Sample Administration Receipt Documentation Log

Doc Log ID: 178310

Group Number(s):

177963

Client: GHD

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	03/17/2017 16:25
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	Yes
Extra Samples:	No	Flow Controller Quantity:	2
Discrepancy in Container Qty on COC:	No	Air Quality Returns:	No

Unpacked by Melvin Sanchez (8943) at 17:18 on 03/17/2017

2425 New Holland Pike
Lancaster, PA 17605-2425

T 717-656-2300
F 717-656-2681
www.LancasterLabs.cor

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Additional Data Qualifiers

Qualifier	Definition
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

Appendix E
PADEP Correspondence

Pennsylvania Department of Environmental Protection

Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428
March 5, 2003

Southeast Regional Office

610-832-5949
Fax 610-832-6143

Mr. Jim Tucker
Senior Staff
Sunoco Inc.
3144 Passyunk Avenue
Philadelphia, PA 19145-5299

Re: ECP - Tanks Program
Sunoco Point Breeze Refinery
AST #797 Site Characterization
Facility ID # 51-36558
e-FACTS Site # 456930
3144 Passyunk Avenue
City of Philadelphia

Dear Mr. Tucker:

The Pennsylvania Department of Environmental Protection (DEP), has received and reviewed the Site Characterization Report, dated December 6, 2002, for the site referenced above. SECOR International Corporation (SECOR), environmental consultant for Sun Oil Company, submitted this Site Characterization Report to the DEP on December 12, 2002. Investigations at this site were initiated in conjunction with the closure of Tank #797 on April 30, 2002. The Above Ground Storage Tank (AST) was approximately 20 feet in diameter and was capable of containing 42,000 gallons. The tank was used to store process water contaminated with "light end hydrocarbons" primarily including Benzene and Isopropyl Benzene (a.k.a. Cumene).

SECOR investigated soil conditions surrounding the AST by sampling at four locations in the immediate vicinity of the AST on May 25, 2002. Analytical results for these surficial soil samples, collected at a 0-2 foot depth, exceed the Act 2 soil to groundwater pathway standard for non-residential used aquifers in boring HA-1, HA-2, HA-3, and HA-4. Act 2 non-residential direct contact standards for benzene were exceeded in borings HA-1 and HA-3. A closure report, dated July 10, 2002 and prepared by SECOR was provided to the DEP. This Site Characterization Report provides no record of DEP's review of this closure report. Sunoco submitted a notification of release on June 10, 2002 and received a Notice of Violation on July 29, 2002 requesting further characterization of soil and groundwater.

Subsequent site characterization activities were initiated in September of 2002 that involved installing three groundwater monitoring wells outside of the tank 797 dike. Soil samples collected at these locations exceeded the Act 2 Nonresidential Soil to Groundwater Pathway Standard for Benzene in

MW-1 (2.6 ppm), MW-2 (6.5 ppm), and Benzene and Toluene in MW-3 (610 ppm and 300 ppm). Act 2 Nonresidential Direct Contact Standards for Benzene in soils were exceeded in MW-3 (610 ppm 0-2' below grade). Groundwater analyticals from the one round of samples collected from the three monitoring wells exceeds the Act 2 Nonresidential Used Aquifer standard for Benzene in all three wells (MW-1-32 ppb, MW-2-28,000 ppb, and MW-3-610,000 ppb) and Toluene in MW-3 (59,000 ppb). Dissolved concentrations in MW-2 and MW-3 exceed the Act 2 Used and Non-Use Aquifer Standards for Benzene. Contaminant concentrations of these magnitudes likely represent saturated conditions and should materialize as free product in soils and on groundwater.

Conditions at this site are alarming due to the significant concentrations of petroleum contaminants present in both soils and groundwater. DEP offers the following comments :

1) A minimum of two groundwater sampling events should be conducted separated by a sufficient time period to render them independent. This will verify that the concentrations in groundwater are reproducible and reliable.

2) The lateral extent of the impacted soil and groundwater has not been delineated as described in §245.309 & §245.310 of the Department's regulations.

3) Please provide a map showing the location and description of currently operating recovery systems that would intercept and/or recover any plume from this area.

4) Please provide a risk assessment demonstrating that potentially open exposure pathways associated with soil and groundwater conditions at this site are in compliance with our Act 2 Acceptable Risk Ranges. Interim Remedial Actions should be implemented if conditions are outside acceptable risk ranges.

5) Please provide any additional data that may be pertinent to the distribution of contaminants in groundwater associated with this site from other sources in the vicinity of tank 797. What engineering performance standards for soil were considered in the construction of this tank dike ?

6) Data presented in the Site Characterization Report is insufficient to construct a reasonable and/or defensible fate and transport model.

7) Please consider, and share with SECOR, the additional data collected throughout the entire refinery as reported in the Comprehensive Remedial Plan reflecting known groundwater patterns of flow.

At this time, the Site Characterization Report is determined to be incomplete due to the limited groundwater data available and the need to further evaluate groundwater and soils at this site.

The closure of this regulated AST should follow the Corrective Action Procedures as specified in the Department's regulations. A final demonstration of attainment must comply with our Act 2 Regulations (see §250). References to the USEPA Environmental Indicators Program do not supersede the requirements of the Pennsylvania Statutes referenced above.

DEP looks forward to receiving and reviewing a complete site characterization report that considers the comments offered in this letter. Please provide a schedule of events planned for this site that will move the Site Characterization closer to completion. Please prepare and submit Act 2 Demonstration of Attainment Reports for soil and groundwater at this site considering the comments offered above.

If you have any questions or need further information regarding this matter, please contact the Environmental Cleanup Program.

Sincerely,

Walter J. Payne, P.G.
Licensed Geological Professional
Environmental Cleanup Program

cc: Mr. Beitler
Mr. O'Neil
Mr. Day-Lewis
Mr. Sinding
Mr. Burke
Mr. S. Brown
Mr. Mountain
Mr. Swokal
Mr. Sneath, Esq.
Mr. Gotthold
Mr. Opppenheim
Mr. Zipin
Regional File

pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION	**REPORT COMMENTS** C. David Brown 22 Nov 2013	**Commonwealth of Pennsylvania** **Department of Environmental Protection** **Southeast Regional Office** **Environmental Cleanup and Brownfields**

Site: **Philadelphia Refinery AOI 6** 3144 Passyunk Avenue Philadelphia, PA 19145	eFACTS Facility ID: 769099	Tank Facility ID: 51-11554, 51-36558
	Incident ID: *multiple*	NIR Date: 16 Oct 2006
Municipality: Philadelphia	County: Philadelphia	Location: 39.9026°N, 75.2074°W

Comments on "Site Characterization/Remedial Investigation Report" dated 3 Sep 2013, prepared by Langan Engineering and Environmental Services, for the former Sunoco Philadelphia Refinery, currently the Philadelphia Energy Solutions Refining and Marketing LLC facility.

General

1. This report was submitted only as an Act 2 remedial investigation report (RIR). However, it includes a risk assessment (§9.0 and Appendix G). A risk assessment report (RAR) is required when performing a baseline risk assessment and for developing site-specific standards (Sections 250.405, 409, and 601). Submission of a RAR must be noted on the transmittal sheet, include payment of the $250 review fee, and include municipal and public notifications.
2. DEP has not formally reviewed the risk assessment portion of the report pending completion of RAR administrative requirements. Some comments are provided below.

Soil Investigation

3. The report only includes soil sampling data from 2006 and 2012 (and tank investigations in Appendix E). Was there no relevant soil data from before 2006?
4. Our records include reports of several historic incidents in AOI 6 that were not addressed in the RIR. Was there remediation and/or soil sampling at these areas? What were the results?

Date	Location	Material	Description
4/28/1992	4th Street	cat charge stock	~10 Bbl released from transfer line
Sep 1992	near Main Office Building	jet fuel	~4000 gal released from underground line
9/3/1993	near No. 4 boilerhouse	No. 2 fuel oil	~30 Bbl released from transfer line
2/21/1994	5th Street and Y Avenue	naphtha	~100 Bbl released from aboveground line

5. Are there records of other recent surface or subsurface releases (say, since 1993) that were, or should have been, investigated?

6. No soil data was presented in this report for the locations of many removed tanks, such as Tanks 237, 238, 240, 241, 242; 401-A, 484, 485; 802–805, and others. Were there closure assessments for these tanks? If not, why hasn't soil been investigated in those areas?

7. There is little or no soil data in some areas with LNAPL plumes. These include the area around the 27 Pump House, wells B-129, B-47, U-3, and B-124. There were presumably surface or shallow releases that were the source of product at these locations, and there may be remaining soil impacts. There should be soil investigations in these areas.

8. What was the rationale for the soil sampling in the northwest section of the area, at and around BH-12-110 and BH-12-106?

9. Contamination in the area of Tank 797 is not delineated to the northwest, north, and northeast.

10. Figure J-3 in Appendix J shows impervious surfaces. We ask that you plot soil sample locations with soil-to-groundwater standard exceedences on this map. Any areas where there are exceedences under pavement may need to have this engineering control maintained in the future.

11. Figure J-3 does not depict the tank pads of removed ASTs as impermeable surfaces. Aren't these pads concrete?

LNAPL

12. The report (§7.4 and Appendix H) indicates API modeling was performed for the wells near 27 Pump House in 2006; it indicated the LNAPL was mobile, but a recovery system was operating. Was the modeling repeated using the 2012 data after recovery ceased? Is that LNAPL plume still mobile or not?

Vapor Intrusion

13. Are all employees in the Main Office Building, the Training Building, and the 24 Gate Building subject to OSHA regulations? For instance, do all workers have annual OSHA training and medical monitoring? Is PES in compliance with 29 CFR Section 1910.1028 for all employees in these buildings? What documentation do PES and Sunoco have demonstrating applicability of OSHA standards to all employees?

14. Did Stantec survey the buildings for possible indoor contaminant sources?

15. How were the buildings ventilated before and during the sampling? Were they being heated?

16. The samples were collected for 4 hr. DEP and EPA recommend 8-hr indoor air samples in nonresidential buildings.

17. Stantec obtained trip blanks. There is little QA/QC value to a trip blank in a Summa canister. A field blank would be more useful.

18. Why wasn't naphthalene analyzed in the indoor air samples? Naphthalene is on Sunoco's contaminant list, it is listed by EPA and DEP as a substance of potential VI concern, and it has an OSHA PEL. Naphthalene can be analyzed using Method TO-15.

19. Detected indoor air concentrations were uniformly higher than (though of similar magnitude to) the outdoor ambient sample. This implies the role of some combination of vapor intrusion and indoor sources. The basement samples in the GP Main Office Building had generally higher concentrations than samples from the first and second floors, which could indicate vapor intrusion.

20. Stantec's description of risk-based screening in §6.2 of the Mar 2013 report (Appendix I) is not correct. DEP's indoor air criteria in our 2004 guidance are derived for the Statewide health standard only (a cancer risk of 10^{-5} and a hazard quotient of 1.0 for each substance). The site-specific standard has been selected for the refinery. The SHS screening criteria are not applicable for the SSS. A SSS pathway evaluation and human health risk assessment is required. Refer to DEP's online Q&A. We do allow SSS screening for indoor air sampling data based on properly adjusted EPA RSLs as described in the Q&A and the Technical Guidance Manual (Section IV.G.2.a.i., p. IV-116). These correspond to a cancer risk of 10^{-6} and a HQ of 0.1 for each substance. On this basis several indoor air results would exceed the SSS screening and require a risk assessment.

Storage Tanks

21. Two tanks have open incidents that were not addressed in the RIR/SCR. Corrective action is required for these tanks, and they must have a site characterization. They are:

Sunoco Tank	DEP Tank	Incident Date	Incident ID	Facility ID	Material
T-81	121A	9/12/1993	45692	51-11554	fresh caustic
676	130A	7/19/1998	4844	51-36558	No. 6 fuel oil
676	130A	1/11/2000	6133	51-36558	No. 6 fuel oil

22. We request that you *do not* include documentation (such as past reports) in the RIRs for tanks that were either closed with no confirmed contamination or that completed corrective action such that the incident was already closed in our records. (For example, Tanks 677, 201, and 1088.)

23. Appendix E, Attachment A lacks soil disposal documentation for Tank GP 250.

24. Please clarify what materials were stored in Tank 797. Different sections of the report refer to benzene, cumene, and process water. What is an appropriate analyte list for the release from this tank?

25. Appendix E recommends that DEP administratively close out the cases for five tanks. One of these, Tank 797, will require further action.

Sunoco ID	DEP ID	Incident	Explanation
GP U 201	175A	38646	We closed the incident for this tank on 7/30/2008, and no further action was required.
GP U 1088	089A	38644	We closed the incident for this tank on 7/30/2008, and no further action was required.
GP U 677	131A	n/a	This tank was closed in place and no release was confirmed. There is no incident to close in our records. Additional investigation might be warranted when the tank is dismantled.

Sunoco ID	DEP ID	Incident	Explanation
GP 250	030A	37546	Based on the information provided in the report, there appeared to be a satisfactory demonstration of attainment for soil pursuant to §245.310(b). This incident can be closed upon receipt of soil disposal documentation.
GP 797	097A	29122	The information in the report did not demonstrate attainment of an Act 2 standard. The incident will remain open until that is accomplished.

Fate & Transport Modeling

DEP provided several general remarks on fate-and-transport analyses in the 12 Sep 2013 comments for AOI 11. Many of those apply to the modeling described in the AOI 6 report as well. Some additional comments follow.

26. Modeling in Appendix F was based on groundwater contamination in 18 wells. Because Sunoco did not sample groundwater in wells with LNAPL, no exceedences were identified in those areas and they were not considered as sources for dissolved contaminant plumes. However, LNAPL is a source for dissolved contaminants, and there should be fate-and-transport analyses for all locations with LNAPL.

27. The modeling used a hydraulic conductivity of 24 ft/day from a 2002 study by URS. Please provide the complete data and solutions for that well testing.

28. The two-step model assigns a low permeability ($K = 0.28$ ft/day) to a 150-foot-wide zone adjacent to the river. This is intended to simulate the effect of the sheet pile wall. However, it artificially slows the plume over and allows contaminant degradation to have a much greater role. This may not be realistic. The low-permeability zone is in fact only a foot or two wide near the wall.

29. Sunoco should consider how the hydraulic gradient changes as a plume approaches the sheet pile wall. As the gradient decreases the seepage velocity will decrease, changing the relative importance of advection and decay.

30. What is the transport distance from each source to the river?

31. On Figure F.1 show, for each modeled plume: the centerline, the planform outline, and the intersection with the sheet-pile wall.

32. Langan does not give a complete picture of contaminant fate and transport by basing the modeling on 2013 sampling data alone. For instance, well URS-5 was not sampled in the last event, but in 2006 the benzene concentration was 5900 μg/L. This well is ~60′ from the river. Is this contamination part of the plume from B-154/155? Or is it a separate source area? What does it mean for benzene reaching the river? Are there other wells that weren't sampled in 2013 but had elevated contaminant levels previously that are of concern?

33. The model results are poorly determined because of the lack of calibration wells. Are none of the wells between the source area (B-154 and B-155) and the river suitable for calibration? If not, Sunoco should consider installing calibration wells.

34. A 1 Apr 2011 DEP memo, provided to Sunoco and Langan on 28 Apr 2011, explained that there should be a determination of the cumulative contaminant loading by diffuse groundwater flow into the Schuylkill River, and not just modeling for individual sources. We recommend that all sources in each AOI be evaluated cumulatively; after approval of all RIRs Sunoco should submit a report that evaluates the cumulative river loading from all refinery sources.

35. As noted in the 12 Sep 2013 AOI 11 comments, the tidal portion of the Schuylkill River is exempt from Ch. 93 potable water supply standards.

Risk Assessment

36. The soil direct contact exposure scenario needs to be much more clearly defined. There should probably be more than one scenario. Appendix G refers to "an industrial worker scenario." Is this a refinery operator, a contractor, a worker involved in excavation, or some other employee? You've assumed an equal likelihood of exposure to soil represented by all samples in AOI 6, although sampling is biased to certain areas and workers may rarely frequent some of those areas. Workers are not confined to AOI 6, and will have exposures elsewhere in the facility. What if an employee is working for a year in an area with elevated benzene in soil (e.g., vicinity of Tank 797); what would that risk level be? (See EPA's exposure assessment guidance.)

37. All formulas used and all input parameter values must be provided for the risk calculations. Explain what the exposure route is—ingestion or inhalation (by volatiles or particulates).

38. Only carcinogenic risks were calculated for benzene. Benzene also has non-cancer toxicity, and this must be evaluated as well.

39. The revised target and baseline blood lead levels appear to be appropriate. Based on these studies, we expect that the geometric standard deviation of blood lead distribution should also change. This value should be determined and input into the calculation.

C. David Brown | 11/22/13

C. David Brown P.G. | Date

Pennsylvania Registered Professional Geologist No. PG005002

pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION	**MEETING NOTES** C. David Brown 25 Feb 2016	Commonwealth of Pennsylvania Department of Environmental Protection Southeast Regional Office Environmental Cleanup and Brownfields

Site: **Philadelphia Energy Solutions Refinery** 3144 Passyunk Avenue Philadelphia, PA 19145		Area of Investigation: **AOI 6**	eFACTS Facility ID: 769099
		Tank Facility ID: 51-11554, 51-36558	NIR Date: 17 Nov 2014
Municipality: City of Philadelphia	County: Philadelphia		Location: 39.9026°N, 75.2074°W
Owner: Philadelphia Energy Solutions Refining and Marketing LLC 3144 Passyunk Ave. Philadelphia, PA 19145	Remediator: Evergreen Resources Management Operations 2 Righter Parkway, Suite 200 Wilmington, DE 19803		Consultants: Aquaterra GHD
Contact: Chuck Barksdale (215-339-2074)	Contact: Jim Oppenheim (302-477-0192)		Contact: Colleen Costello (GHD) (610-321-1800)

Attendees:		**Date:** 19 Feb 2016
DEP	David Brown	
Evergreen	Jim Oppenheim	
Aquaterra	Tiffani Doerr	
GHD	Colleen Costello, David Steele	

On 19 Feb 2016 we met at DEP's office to discuss the AOI 6 (Girard Point Chemical Processing Area) remedial investigation work plan. An earlier RIR had been submitted in Sep 2013 which DEP disapproved 27 Nov 2013. (Comprehensive comments on that RIR were provided to Evergreen on 22 Nov 2013.) We also talked about several general issues for the Act 2 work and AOI 9 which are described first below. At the conclusion of the meeting we turned to the offsite LNAPL plume at the North Yard (AOI 9), described at end of these notes. (The Philadelphia Refinery meeting was held in conjunction with a meeting on the Marcus Hook Industrial Complex AOI 6 work plan, which is described in separate notes.)

General

Evergreen has a goal of completing the remaining remedial investigations in 2016; this is central to submitting the final report(s) by 2020. All RIRs would be submitted by about Jan 2017. They wish to meet to discuss work plans and also present the RIRs just before submittal. Aquaterra provided a schedule of proposed meeting dates.

There will likely be a single site-wide cleanup plan. Ms. Costello reiterated that the expected soil cleanup remedies will be localized excavations and capping of direct contact standard

exceedences. They are not planning risk assessments or numeric standards, other than for lead which has already been approved.

I asked about the 2012 buyer–seller agreement condition to submit all SCR/RIRs by Dec 2015. Mr. Oppenheim replied that he understood this to include the previously submitted SCRs under the Water Quality Program order; therefore, he believed the condition was satisfied. The AOI 9 RIR was submitted in December to meet the deadline for that area.

AOI 9 RIR

DEP had started to review the AOI 9 RIR and I had only two preliminary comments. I asked that relevant prior submissions, such as the Water Quality SCRs and work plans, be incorporated into the RIRs as a CD-ROM appendix. Although DEP has copies of these reports, they are not all in the public files.

I noted that the AOI 9 RIR apparently does not include complete site characterization reporting information for open storage tank incidents as required by the corrective action regulations. DEP's expectations may have been misunderstood when the topic of SCR reporting was discussed in the Sep 2015 meeting. Ch. 245 requires that SCRs be submitted within 180 days of confirmation of a regulated tank release. DEP, Sunoco, and Evergreen have had an informal agreement deferring storage tank site characterizations and reporting until the submittal of the Act 2 RIRs. Now that RIRs are being completed, we expect the SCRs to be submitted as well. Evergreen can either include the SCRs in the RIRs (as had been done previously), as one or more separate reports, at the same time or prior to the RIR submittals. DEP doesn't have a strong preference as to how it is done, but we're unwilling to defer the SCRs any longer. If there are occasional cases in which a SCR can't be completed on this schedule (e.g., sampling issues), we can accommodate that.

DEP won't disapprove the AOI 9 RIR for incomplete SCRs, but SCRs for the remaining open tank incidents should be submitted in the near future. Ms. Doerr explained that they're working on obtaining archival tank records (such as soil disposal manifests) site-wide, which will take some more time. I confirmed that regulated tank releases are those from a tank system within the emergency containment area. Releases from lines outside the dikes, or from lines inside dikes that are not part of the tank system, should be addressed through Act 2.

AOI 6 Work Plan

GHD is the lead consultant on the AOI 6 remedial investigation. I was provided with a map [attached] showing planned sampling locations; there are 29 soil borings and four monitoring wells (which will include soil sampling). Soil samples will be obtained at depths of 0–2′ and at 2–15′ above the water table. Analyses will be conducted using the standard contaminants of concern list. Soil exceedences will generally be delineated to the direct contact standard.

GHD described the six areas of further soil investigation.

• Area 1: Tank 676. This was a regulated tank release of No. 6 fuel oil (1998). The AST is no longer present. The release flowed over the surface toward the Schuylkill River, so there is an

expanded area of investigation west of the tank location. Some historic data is available around the tank. Six new soil borings are planned.

• Area 2: 1332 Unit. There was a documented release, but the exact location is uncertain. There are limitations on where they can drill. Three points alongside the unit are planned.

• Area 3: former tank location. There was a line release near the tank. Four sample points are planned.

• Area 4: at Tank 251. This was another line release. Three points are planned.

• Area 5: next to the main building. There was a jet fuel release from a line. Five points are planned. There are some access limitations.

• Area 6: Tank 797. This was a regulated tank release (2002); the vessel has stored benzene and cumene. Previous sampling indicated direct contact exceedences. Six new points are planned, all apparently outside the emergency containment.

I asked whether soil contamination was adequately delineated within the Tank 797 dikes. DEP favors a complete characterization, but we recognize that some delineation might only be needed for the remedy selection and can come after the RIR. DEP disapproved a SCR for the tank in Mar 2003, and GHD should check on the deficiencies. I recommended some additional sampling inside the containment area.

Mr. Oppenheim mentioned that the LNAPL at Tank 797 may have originated at 27 Pump House. He asked if it needed to be addressed as part of the tank investigation. I said that the tank corrective action could focus on soil; we understand that LNAPL and groundwater are being addressed site-wide through Act 2.

The four new monitoring wells are on the west side of AOI 6 and will be used to delineate LNAPL and characterize plumes. A subset of monitoring wells will be sampled: along the property boundaries, within LNAPL plumes, and downgradient of LNAPL. They will also sample the four deep wells.

GHD was uncertain if there are viable wells in the middle distillate plume in the southwest section of the area. If not, they will consider installing a well to obtain current data. I asked if groundwater was adequately characterized in Areas 4 and 5, as there do not appear to be active wells there. Mr. Steele said that the wells that had been there were temporary and apparently didn't show exceedences. They will check on the need for new wells.

There is some prior indoor air data collected by Stantec. There will be additional indoor air sampling in all occupied buildings. PES's list of buildings at the facility is being reviewed.

Offsite LNAPL, North Yard

LNAPL was identified on a Verizon property on the north side of AOI 8 in 2011. The product was inferred to have originated from the refinery. On 11 Sep 2015 Stantec provided a schedule for work to address the LNAPL on behalf of Evergreen. DEP responded on 24 Sep 2015 with concerns on the pace of work. Aquaterra supplied a letter describing interim remedial actions and a revised schedule.

Stantec has initiated LNAPL recovery using a vacuum truck and absorbent socks at the refinery wells. Evergreen now has an access agreement with Verizon, so they plan to gauge, sample, and remove LNAPL from those wells also. The oil is thick and will be difficult to remove using common technologies. I asked that they provide me with a report on their selected remedy, which they anticipate deciding later this year.

Stantec will assess vapor intrusion for the Verizon building. We talked about analyzing the content of the LNAPL to determine if VOCs of VI concern were present. This analysis could have relatively high detection limits, so nondetect results might not rule out the VI pathway.

	2/26/16
C. David Brown P.G.	Date

Pennsylvania Registered Professional Geologist No. PG005002

4100-FM-SERO0026 12/2015

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE - NORRISTOWN

2 East Main Street
Norristown, PA 19401

MEETING LOG

Date: 19 Feb 2016 **Subject:** Philadelphia Refinery, Marcus Hook Industrial Complex

Programs Attending:

☐ RD ☐ AQ ☐ BUS ☐ CRC ☐ CW ☒ ECB ☐ ER ☐ RP ☐ SDW ☐ WAW ☐ WM

NAME	TITLE	PROGRAM/COMPANY	PHONE #	E-MAIL
C. David Brown	LPG	ECB DEP		
Jim Oppenheim	VP	EVERGREEN		
Tiffani Doerr	PG	Aquaterra		tdoerr@evergreenresmgt.com
David Steele		GHD		david.steele@ghd.com
Colleen Costello	PG	GHD		colleen.costello@ghd.com

pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION	**TECHNICAL REVIEW** C. David Brown 29 Aug 2017	Commonwealth of Pennsylvania Department of Environmental Protection Southeast Regional Office Environmental Cleanup and Brownfields

Site: **Philadelphia Refinery, Girard Point** 3144 West Passyunk Avenue Philadelphia, PA 19145	eFACTS Facility ID:	Tank Facility ID: 51-36558
	Incident ID: 37546	NOC Date: 27 Jan 2007
Municipality: City of Philadelphia	County: Philadelphia	Location: 39.9024°N, 75.2031°W
Owner: Philadelphia Energy Solutions Refining and Marketing LLC 3144 Passyunk Ave. Philadelphia, PA 19145	Remediator: Evergreen Resources Management Operations 2 Righter Parkway, Suite 200 Wilmington, DE 19803	Consultant: Stantec Consulting Services, Inc. 1060 Andrew Drive, Suite 140 West Chester, PA 19380
Contact: Chuck Barksdale (215-339-2074)	Contact: Tiffani Doerr (302-477-1305)	Contact: Jennifer Menges (610-840-2540)

I reviewed the letter report titled "Tank GP 250 Soil Sampling," prepared by Secor International, Inc., dated 19 Jul 2007 and received on 31 Jul 2007. The report was acknowledged by DEP as a RACR in a 15 Aug 2007 letter, but it was not reviewed and no decision was issued.

Tank 250 (DEP ID 030A) was constructed in 1939, and it has been used to store heating oil. (This AST is presently registered under 51-33624 as DEP ID 019A.) A kerosene release occurred from a tank line on 27 Jan 2007. Approximately 600 gal of product was released to the ground in the emergency containment area. An estimated 40 yd^3 of surface soil was impacted. Interim remedial actions included removal by a vacuum truck and soil excavation. The quantity and disposition of excavated soil were not reported. Evergreen has previously sought documentation of historic soil disposals in the refinery's records, but that information has generally not been available for individual tank activities. Kerosene and water removed by the vacuum truck were presumably recycled within the facility.

Eight soil samples were collected at ~0.5′ depth in the excavated area in May and Jul 2007. They were apparently distributed in a systematic random manner. The samples were analyzed for the petroleum short list at that time, including eight VOCs, fluorene, and lead. Two samples exceeded the lead soil-to-groundwater MSC. One exceeded the direct contact MSC, but not the site-specific lead numerical value approved under Act 2 in May 2015. There were no other exceedances of nonresidential Statewide health standard MSCs.

Lead is not a contaminant of concern for kerosene. The lead may be attributable to historic fill or the release of other materials at the facility. Lead is being addressed site-wide through Act 2.

There are no occupied buildings within 100′ of the release area, and vapor intrusion is not a concern. Because a small quantity of light petroleum product was released, an ecological evaluation is not required. The nearest surface water is over 2000′ distant.

The report substantially met the requirements of §245.310(b). The Statewide health standard was attained for the substances listed below in soil. The report is classified as "deemed approved" per §245.310(d). I have closed the incident, and no further corrective action is required.

Statewide Health Standard (nonresidential):
Soil
Benzene Cumene Ethylbenzene Naphthalene Toluene Xylenes
Fluorene

C. David Brown | 8/29/17

C. David Brown P.G. | Date

Pennsylvania Registered Professional Geologist No. PG005002

Appendix F
LNAPL Conceptual Site Model

Appendix F
LNAPL Conceptual Site Model

Light Non-Aqueous Phase Liquid Conceptual Site Model Area of Interest 6

Appendix F

Girard Point Refinery
3144 Passyunk Avenue
Philadelphia Energy Solutions Complex
Philadelphia, Pennsylvania

GHD | 1140 Welsh Road Suite 120 North Wales Pennsylvania 19454 United States

11109613 | Report No 1 | Appendix F | November 21 2017

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Acronyms and Abbreviations

ANT	apparent NAPL thickness
AOI	Area of Interest
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
cm/s	centimeters per second
cm^2	square centimeters
cm^3s/g	cubic centimeter seconds per gram
cP	centipoise
Evergreen	Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
ft	Feet or foot
g/ml	grams per milliliter
IST	Integrated Science & Technology, Inc.
ITRC	Interstate Technology & Regulatory Council
K_i	intrinsic permeability
K_{ro}	LNAPL relative permeability
LCSM	LNAPL Conceptual Site Model
LDRM	LNAPL Distribution and Recovery Model
LNAPL	Light Non-aqueous Phase Liquid
M_o NAPL	LNAPL mobility term Non-aqueous Phase Liquid
PADEP	Pennsylvania Department of Environmental Protection
PES Complex	Philadelphia Refining Complex
Q_0	LNAPL discharge rate
Q_w	water discharge rate
RIR	Remedial Investigation Report
SCR	Site Characterization Report
SECOR	Secor International Inc.
Site	AOI 4 of the PES Complex
Stantec	Stantec Consulting Services Inc.
Sunoco	Sunoco, Inc.
T_n	LNAPL Transmissivity
T_w	aquifer transmissivity
USEPA	U.S. Environmental Protection Agency
μ_o	LNAPL dynamic viscosity
ρ_r	LNAPL/water density ratio

Glossary

Capillary Pressure: The difference between the fluid pressure in the non-wetting phase (typically LNAPL) and the pressure in the wetting phase (typically water) at a given reference point. This pressure may also be referred to as the "excess pressure". The larger the capillary pressure, the greater the LNAPL saturation and the greater the potential for LNAPL mobility. For LNAPL movement or migration to occur, capillary pressure must exceed the resistive forces in the soil formation.

Confined Condition: A subsurface condition where pore fluids are under pressure at all reference points or elevations. In a confined condition, in-well LNAPL thickness varies directly with potentiometric surface elevation. Hence, an increase in the potentiometric surface elevation leads to an increase in in-well LNAPL thickness, and vice versa. LNAPL within the secondary porosity (fractures, fissures, seams) of fine textured soils (silts and clays) is often present in a confined condition. Confined conditions will often produce in-well LNAPL thicknesses that grossly over-represent the extent of impacts in the formation.

C_{sat}: The theoretical limit of a soil's ability to effectively hold or contain a chemical constituent (or mixture) in the adsorbed, dissolved and vapor phases. Total soil concentrations in excess of a chemical constituent's (or mixture's) corresponding C_{sat} value will typically be assumed to indicate the presence of LNAPL. Published C_{sat} values will have limited use at LNAPL sites due to the site-specific nature of LNAPL composition and the difficulty in determining appropriate C_{sat} values for complex petroleum mixtures consisting of hundreds of individual chemical constituents.

Effective Solubility: Different than pure-phase solubility, effective solubility describes the ability of a chemical constituent from a mixture to dissolve in water in the presence of other constituents in the mixture. It is a particularly important consideration for LNAPLs that are complex petroleum mixtures. Effective solubility is a function of the mole fraction of the constituent in the mixture, and is commonly orders of magnitude less than the constituent's corresponding pure-phase solubility. Groundwater concentrations in excess of a petroleum constituent's effective solubility will typically indicate the presence of LNAPL in the vicinity of a monitoring well.

Interfacial Tensions: The tension or attractive forces between two fluids along the interface of contact with one another. The interfacial tension between LNAPL and water in the subsurface tends to limit the ability of LNAPL to move.

Laser-Induced Fluorescence (LIF): A real-time LNAPL delineation technology that uses ultraviolet wavelengths of light to cause polycyclic aromatic hydrocarbons (PAHs) to fluoresce. All petroleum-based LNAPLs contain PAHs, allowing the use of LIF to detect the presence of LNAPL. LIF is employed in the field using direct-push techniques to delineate LNAPL impacts in the subsurface laterally and vertically (both above and below the water table). LIF also provides an indication of the intensity of impacts across an LNAPL body and the types of LNAPL encountered.

LNAPL: Light non-aqueous phase liquid. LNAPLs are immiscible fluids that are less dense than water, and may be comprised of a pure chemical or solvent, or comprised of a complex mixture of chemicals, such as petroleum-based fuels. The term "LNAPL" most often refers to immiscible petroleum mixtures/fuels (i.e., gasoline, kerosene, diesel, crude oil, etc.).

LNAPL Body: The multi-phase fluid zone of LNAPL impacts in the subsurface. An LNAPL body is comprised of three fluids: air, LNAPL and water. Generally speaking, an LNAPL body is predominantly comprised of water, with a lesser amount of LNAPL, and the least amount of air.

LNAPL Conductivity: A hydrogeological term that helps describe the ability of LNAPL to move through the subsurface. LNAPL conductivity accounts for the LNAPL relative permeability, hydraulic conductivity, and the densities and viscosities of the fluids (water and LNAPL). LNAPL conductivity is a function of and varies directly with LNAPL relative permeability. Hence, an increase in LNAPL relative permeability results in an increase in LNAPL conductivity, and vice versa.

LNAPL Migration: A description of the expansion of the perimeter of an unstable LNAPL body in some or all directions (i.e., footprint of the overall LNAPL body or body periphery is continuing to grow). All migrating LNAPL is mobile; not all mobile LNAPL is migrating. Mobile LNAPL can be present within the interior of an LNAPL body that is not migrating.

LNAPL Mobility: A description of the potential for LNAPL to move at any point within an LNAPL body. LNAPL may be mobile where the LNAPL is continuous at saturations above residual saturation. Because LNAPL residual saturation within a LNAPL body varies from the vadose zone to the saturated zone, LNAPL mobility may also vary due to fluctuations in the water table elevation. The presence of mobile LNAPL within an LNAPL body does not necessarily mean that the LNAPL body as a whole is unstable or migrating.

LNAPL Pressure Head: The LNAPL pressure conditions at any point within an LNAPL body created by the release conditions. The pressure head can result from the vertical column of LNAPL due to accumulation at or in the vicinity of the water table from a surface or near-surface source (e.g., tank), or from other pressure conditions at the time of the release (e.g., pressure conditions of a subsurface pipeline release). The greater the pressure head, the more the LNAPL will penetrate into the water table (both vertically and laterally) and spread. Once the pressure head dissipates (i.e., source of release is terminated), the LNAPL will soon after cease to migrate and achieve a stable perimeter.

LNAPL Relative Permeability: A measure of the porous medium's (soil's) ability to enable movement of LNAPL in the subsurface in the presence of water. LNAPL relative permeability is a function of and varies directly with LNAPL saturation. Hence, an increase in LNAPL saturation results in an increase in LNAPL relative permeability, and vice versa.

LNAPL Residual Saturation: The LNAPL saturation level or threshold below which LNAPL will not flow under normal hydraulic conditions. LNAPL present at saturations that are less than or equal to residual saturation levels (i.e., within the residual range) will generally be considered to be immobile and unrecoverable. Conceptually speaking, LNAPL residual saturation represents the LNAPL saturation threshold where the LNAPL, due to its relatively low saturation, starts to break-up or become discontinuous in the form of droplets, stringers, ganglia, etc. As LNAPL saturation approaches or decreases to residual, the relative permeability of the LNAPL approaches zero, and the conductivity of the LNAPL approaches zero. The more LNAPL that initially saturates the soil pore space during a release, the higher the residual saturation will be (up to a theoretical maximum). Consequently, LNAPL residual saturation also varies continuously within an LNAPL body.

LNAPL Saturation: The percent of the soil pore space that is occupied by LNAPL. LNAPL saturation at a given point in the subsurface will be proportional to the capillary pressure at that point (i.e., the greater the capillary pressure, the greater the resulting LNAPL saturation). Because the capillary pressure varies throughout the impacted zone, the LNAPL saturation also varies accordingly. The larger the soil pore space, the greater the ability for the soil to hold LNAPL, the greater the LNAPL saturation, and vice versa.

LNAPL Stability: A description of the potential for the perimeter or footprint of an LNAPL body to move or expand over time. A LNAPL body that is moving or expanding (i.e., footprint of LNAPL body is growing) is deemed to be unstable or migrating. Conversely, a LNAPL body that is not moving or expanding with time is deemed to be stable, immobile, or non-migrating. Stable LNAPL bodies can contain localized areas of mobile LNAPL, with the overall footprint remaining unchanged over time.

LNAPL Velocity: The speed and direction at which the LNAPL can travel, based on Darcy flow principles. LNAPL velocity is based on the properties of the porous medium and fluids (water and LNAPL), pore fluid saturations, and the LNAPL gradient. LNAPL velocity only applies within the LNAPL body where there is continuous LNAPL at saturations above residual. There is no LNAPL velocity or movement within an LNAPL body where the LNAPL is not continuous and saturations are below residual. In addition, there is no LNAPL velocity or movement outside of a stable LNAPL body.

Non-Wetting Fluid: The fluid that does not preferentially coat the soil grains or particles in a multi-phase fluid system, but rather occupies the middle of the larger soil pores. In an air-water-LNAPL system (typical of an LNAPL body), both air (primarily in the unsaturated portion of the smear zone) and LNAPL (primarily in the saturated portion of the smear zone) tend to be the non-wetting fluids.

Pore Entry Displacement Pressure: The threshold pressure necessary for one fluid to enter into a porous medium occupied by another fluid, thereby displacing the fluid originally present. Pore entry displacement pressures may account for air displacing groundwater, LNAPL displacing groundwater, air displacing LNAPL, etc. In a water-saturated soil, the capillary pressure must equal or exceed the pore entry displacement pressure for the LNAPL to move and displace water.

Soil Resistive Forces: The forces that act to prevent the movement of LNAPL in a water-saturated porous medium. These forces, which are based on pore entry displacement pressure principles, account for the contact angle or wettability of the fluids (LNAPL and water), the interfacial tension between the fluids, and the soil pore size. LNAPL movement will only occur if the capillary pressure is sufficient to overcome the soil resistive forces.

Unconfined Condition: A subsurface condition with identical or similar pressure-related fluid characteristics to an unconfined aquifer or water table condition. LNAPL within the primary porosity of granular soils (sands and gravels) in a water table/phreatic surface setting is deemed to be in an unconfined condition. In an unconfined condition, in-well LNAPL thickness varies inversely with water table elevation. Hence, an increase in the water table elevation leads to a decrease in in-well LNAPL thickness, and vice versa.

van Genuchten Parameters: Curve fitting parameters that describe how water drains from a given soil in response to increasing pressure conditions. These parameters serve as critical inputs for LNAPL modeling simulations.

Wetting Fluid: The fluid that preferentially coats the soil grains or particles in a multi-phase fluid system. In an air-water-LNAPL system (typical of an LNAPL body), water typically acts as the wetting fluid while air and LNAPL act as non-wetting fluids. The wetting fluid is typically the predominant fluid present in a multi-phase fluid system.

1. Introduction

GHD has prepared this Light Non-aqueous Phase Liquid (LNAPL) Conceptual Site Model (LCSM) report on behalf of Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen), for Area of Interest (AOI) 6 (Site) at the Philadelphia Energy Solutions Refining and Marketing LLC (PES) Philadelphia Refining Complex (Complex) (Figure 1 of the main report). Detailed evaluation of Site background, geology, and hydrogeology is provided in the AOI 6 Remedial Investigation Report (RIR) (GHD, 2016).

The purpose of the LCSM is to communicate Site conditions with respect to subsurface impacts associated with historical petroleum releases. The impacts are described in terms of the release scenario, inferred source area(s), potential subsurface migration pathways, spatial and temporal distribution of LNAPL, and potential mobility. The information presented in the LCSM is intended to establish a framework which allows stakeholders to make informed environmental management decisions regarding the Site. Understanding current conditions is fundamental to the development of the LCSM and allows a platform for data extrapolations and prediction of future conditions. As new information becomes available, the LCSM should be modified, as necessary, to reduce uncertainties and improve the understanding of Site conditions.

2. Fundamentals of LNAPL Behavior

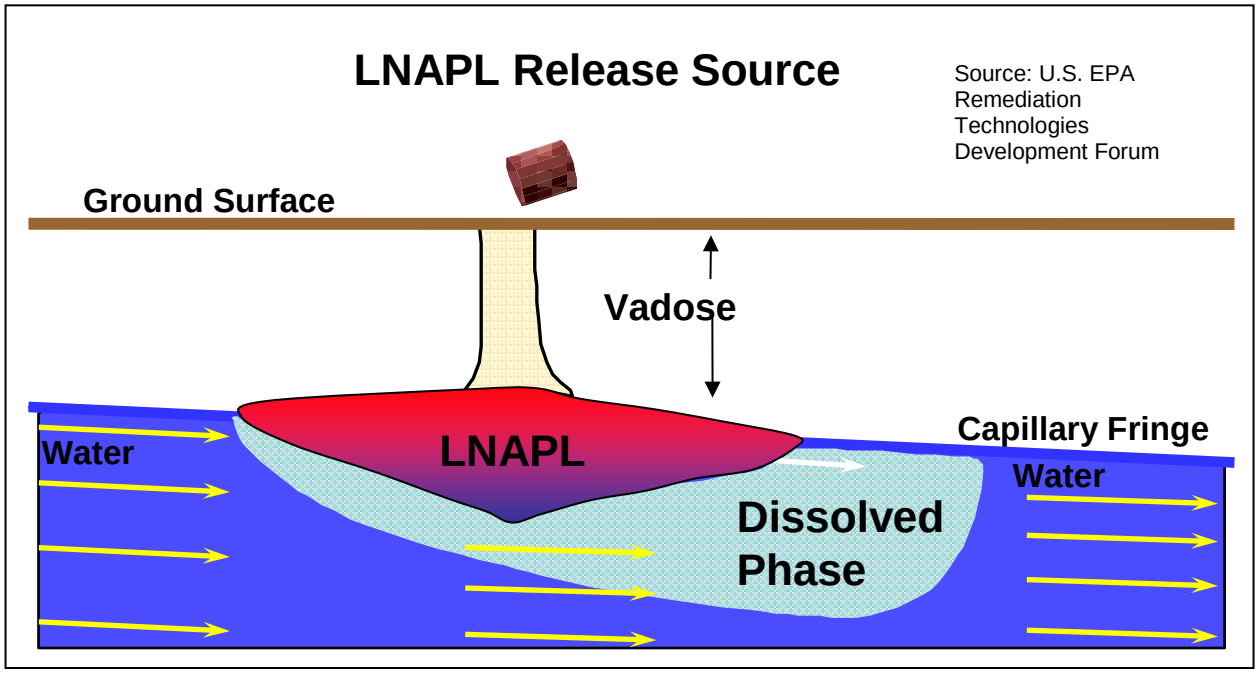
This section addresses LNAPL behavior at the water table (i.e., unconfined condition) and includes the vertical impacted soil zone typically referred to as the smear zone. The smear zone is where potentially mobile LNAPL may reside at sites where the source(s) of the LNAPL impacts have ceased for some time (i.e., no ongoing sources). The behavior of LNAPL in the vadose or unsaturated zone (above the smear zone) is not addressed here since LNAPL in these zones (particularly at older release sites) is often present at low saturations, and does not typically pose a potential for additional LNAPL migration at the water table.

2.1 LNAPL Release Dynamics and the Creation of a Multi-Phase Fluid System

When an LNAPL release occurs, the LNAPL will move vertically downward under the influence of gravity through the soil and, if sufficient LNAPL head is generated, eventually encounter the water table. During the downward movement of LNAPL toward the water table, the presence of confining layers and/or other subsurface heterogeneities may result in exaggerated and uneven lateral spreading and/or perching of LNAPL before the water table is encountered. Once at the water table, the LNAPL will penetrate vertically downward and laterally (including in the up-gradient direction) into the water table, displacing an amount of water proportional to the driving force of the vertical LNAPL column (or LNAPL head) created by the release. The displacement of groundwater will continue to occur as long as the downward force produced by the LNAPL head or pressure from the LNAPL release exceeds the upward force produced by the resistance of the soil matrix and the buoyancy force resulting from the density difference between LNAPL and groundwater. Once the release of LNAPL is terminated, the LNAPL footprint at the water table will continue to expand for a

relatively short time, and eventually stop once the LNAPL head dissipates. The LNAPL eventually ceases to expand because the driving force (pressure or head) responsible for the LNAPL migration is no longer sufficient to overcome the resistive forces necessary to displace groundwater from unimpacted soil pores. When the LNAPL body reaches this state, the LNAPL body is referred to as stable or non-migrating. A conceptual schematic of a stable LNAPL body is provided on Figure 1.

Figure 1 Typical LNAPL Release Scenario with Resulting LNAPL Body at Water Table

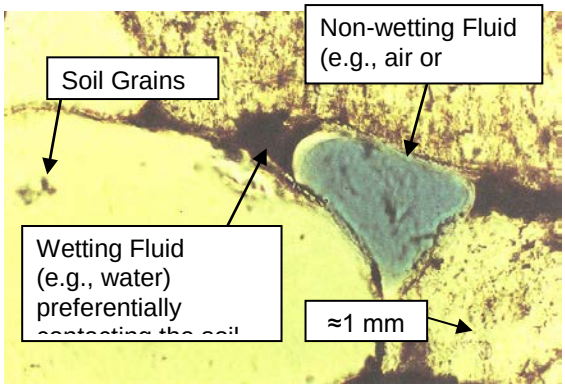


The concept of LNAPL penetrating vertically into the saturated zone (i.e., below the water table) during a release contradicts earlier beliefs that LNAPL completely "floats" like a pancake (filling 100 percent of the soil pore space within the LNAPL impacted zone on top of the water table) due to it being less dense than water, with no portion of the LNAPL penetrating into the saturated zone. Recent LNAPL science and significant empirical evidence have consistently demonstrated that some LNAPL (and often times the majority of LNAPL at a given site) is commonly submerged beneath the theoretical water table surface. Further, LNAPL does not displace all groundwater from the soil pore space, but rather a portion of the groundwater that occupies the "largest" soil pore space only. Consequently, a typical LNAPL body consists of LNAPL filling much less of the soil pore space in a more highly variable and discontinuous distribution than the historical assumption based on the "pancake" conceptualization would indicate. The LNAPL body at the water table is not comprised of a single fluid phase (LNAPL) but rather comprised of multiple fluids, both LNAPL and water. The top portion of the LNAPL body often includes a third fluid phase: air. Therefore, the term "LNAPL body" represents the spatial limits of LNAPL impacts, within which exists a multi-phase fluid system comprised of LNAPL, water and/or air in proportions that will vary throughout. Furthermore, because of the multi-phase nature of LNAPL occurrence in the subsurface, it is generally incorrect to refer to LNAPL as floating on the water table and is more appropriate to think of an LNAPL body as a zone of LNAPL impacts where the pore space contains varying quantities of LNAPL,

groundwater and/or air both above and below the static water table elevation. Generally speaking, the spatial extent occupied by an LNAPL body is predominantly comprised of water, followed by a lesser amount of LNAPL, with the smallest fraction of the pore space occupied by air. Figure 2 presents a pore-scale depiction of LNAPL and water co-existing in the soil pore space.

Figure 2 Photomicrograph of LNAPL and Water Distribution in Soil Pore Space

- LNAPL Co-exists with water in pore network
- Degree of saturation depends upon lithology and fluid properties
- LNAPL partially fills aquifer pore space



Source: U.S. EPA Remediation Technologies Development Forum

LNAPL at the water table requires pressure to move. Unlike groundwater (including dissolved phase constituents), which typically forms a continuous system with flow velocity based on hydraulic gradients, LNAPL, being a non-wetting fluid, requires pressure to force it through the soil pores and displace the existing pore water. More specifically, LNAPL needs sufficient capillary pressure to overcome the resistive forces in the soil to enable the continued displacement of groundwater. In a multi-phase (LNAPL/water) fluid system, capillary pressure (also referred to as excess pressure), is the difference between the pressure in the non-wetting phase (LNAPL) and the pressure in the wetting phase (groundwater). The capillary pressure necessary to overcome the resistive forces for a non-wetting LNAPL to enter water-saturated media is called the pore entry displacement pressure (Mercer and Cohen, 1990). That is, if sufficient pressure is acting on the LNAPL, it will be able to enter a given pore space by forcing some portion of the groundwater out. Once the pore entry displacement pressure is achieved or exceeded, the LNAPL will continue to expand in a vertical and radial direction until there is insufficient LNAPL head or pressure to continue to displace water. The LNAPL head will usually become insufficient to displace water and enter non-impacted pore space shortly after the LNAPL release is terminated. Hence, soon after the LNAPL release is terminated, the LNAPL body eventually becomes stable (i.e., spatial extent no longer moving or expanding).

Because the main mechanism for LNAPL spreading is the pressure/head of the release (during the release and until the LNAPL body stabilizes), the groundwater gradient will influence the direction of the LNAPL spreading to some extent, but groundwater flow will not typically induce additional LNAPL spreading or migration once stabilization has been achieved. In short, LNAPL movement is

not typically caused by horizontal hydraulic gradients (ASTM, 2007). It is also important to note that the radial component that is typical of LNAPL spreading can result in significant up-gradient and cross-gradient LNAPL spreading.

The porous media flow concepts that apply to groundwater systems (Darcy flow equations, etc.) also apply to LNAPL bodies, with two distinct differences. First, LNAPL conductivity (as opposed to water or hydraulic conductivity) includes a relative permeability term, which accounts for the negative influence of groundwater on the ability of LNAPL to flow, and the differences in density and viscosity between LNAPL and groundwater. Second, Darcy flow in an LNAPL body only applies where there is continuous LNAPL within the body. Hence, in any areas of discontinuous LNAPL within an LNAPL body or outside of a stable LNAPL body, there is no LNAPL flow or movement.

2.2 LNAPL Saturation

LNAPL saturation is defined as the percent of the soil pore space that is occupied by LNAPL. As previously discussed, LNAPL does not float on the water table like a pancake, but rather coexists with air and groundwater at varying saturations within the impacted soil zone, both above and below the water table. This is due to the fact that the saturation level of a given LNAPL at a given point in the subsurface will be proportional to the capillary pressure at that point (i.e., the greater the capillary pressure, the greater the resulting LNAPL saturation). Because the capillary pressure will vary throughout the impacted zone, the LNAPL saturation will also vary accordingly.

Geology plays an extremely important role with respect to LNAPL saturation (and mobility). The larger the soil pores in the primary porosity of the soil matrix, the greater the capacity for the soil to hold LNAPL, the greater the ease at which LNAPL can move, and the less pressure that is required for LNAPL to displace water and enter the pore space. Granular soils, such as sands and gravels, have large soil pores, relative to silts and clays, and can hold LNAPL at saturations upwards of 40 to 60 percent (although typical maximum saturations encountered in the field are usually in the 20 to 30 percent range). Conversely, silts and clays, which have extremely small soil pores relative to sands and gravels, will typically only allow LNAPL saturations on the order of 5 to 15 percent. The smaller soil pores not only limit the amount of LNAPL saturation, but also limit the flow or movement of LNAPL.

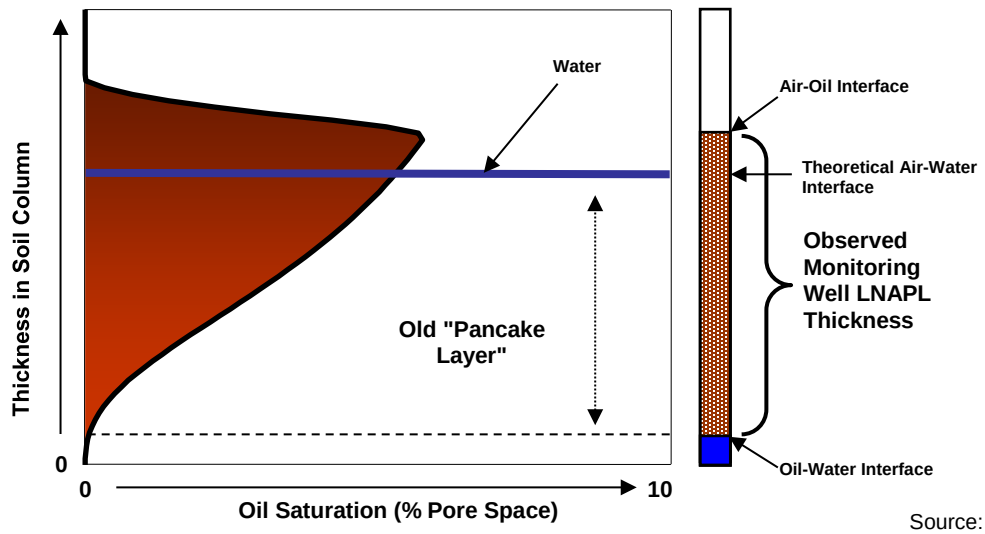
Soil porosity principles for LNAPL saturations and movement in overburden soil may also be applied to certain types of competent bedrock (i.e., bedrock that does not have secondary porosity in the form of fractures). For example, competent sandstone will enable LNAPL to behave in a similar manner as in a similar grain/pore sized sandy soil.

Secondary porosity also plays an extremely important role at LNAPL sites. Fine textured soils, such as silts and clays, are often comprised of a secondary porosity which may include macropores such as fractures, fissures, sand seams, etc. The same holds true for fractured bedrock. Many sites will also contain subsurface infrastructure usually associated with utilities that will constitute manmade macropores. LNAPL movement through secondary porosity may occur at rates several orders of magnitude greater than the movement through the primary porosity. This is primarily due to the fact that the macropores generally have much larger pore sizes than the primary porosity, with a corresponding pore entry displacement pressure that is much lower. That is, LNAPL can displace water and move through macropores much more easily and to a greater extent than it can in the

primary porosity of a fine-grained soil or rock matrix. Hence, the potential for LNAPL movement through secondary porosity must be considered when LNAPL impacts are present in fine textured soil, fractured bedrock, or where subsurface infrastructure coincides with the location of an LNAPL body.

Idealized LNAPL saturation profiles (in the vertical profile) can be generated (using LNAPL analytical models) based on in-well LNAPL thicknesses and the principles of capillary pressure. An idealized saturation profile used to illustrate the typical variation in LNAPL saturation above and below the theoretical water table in a homogenous granular soil with pore fluids at vertical equilibrium is shown on Figure 3.

Figure 3 Idealized LNAPL Saturation Profile Using Capillary Pressure Principles



Source: U.S. EPA Remediation Technologies Development Forum

The idealized LNAPL saturation profile on Figure 3 is based on the in-well LNAPL thickness identified in the monitoring well adjacent to the profile. Note that the saturation profile commences in the capillary fringe, above the corresponding air/LNAPL interface in the well, and continues down to the LNAPL/water interface in a non-linear manner. Note also that the highest degree of LNAPL saturation occurs in the formation at the approximate location of the air/LNAPL interface in the adjacent well. This type of saturation profile is also referred to as a capillary pressure prediction curve, and is based on the following critical assumptions: (1) the fluids (water and LNAPL) are in vertical equilibrium (i.e., not fluctuating up and down); and (2) the soil formation is homogeneous. These assumptions are required for the LNAPL saturation profile to accurately represent and correspond to the in-well LNAPL thickness. Figure 4 illustrates the conceptual depiction of pore scale fluid saturations through an LNAPL body, based on capillary pressure principles. Figure 5 shows how LNAPL saturation profiles can be depicted across an LNAPL body.

Figure 4 Distribution of Different Fluid Phases in a Typical LNAPL Body

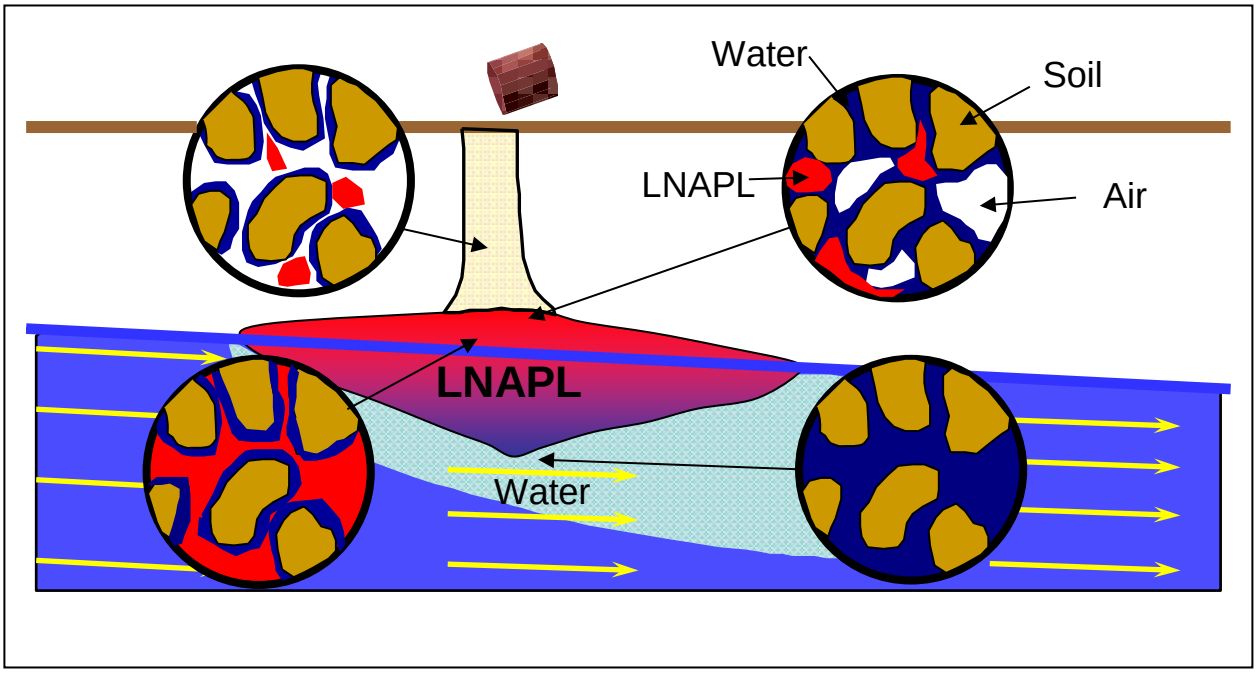
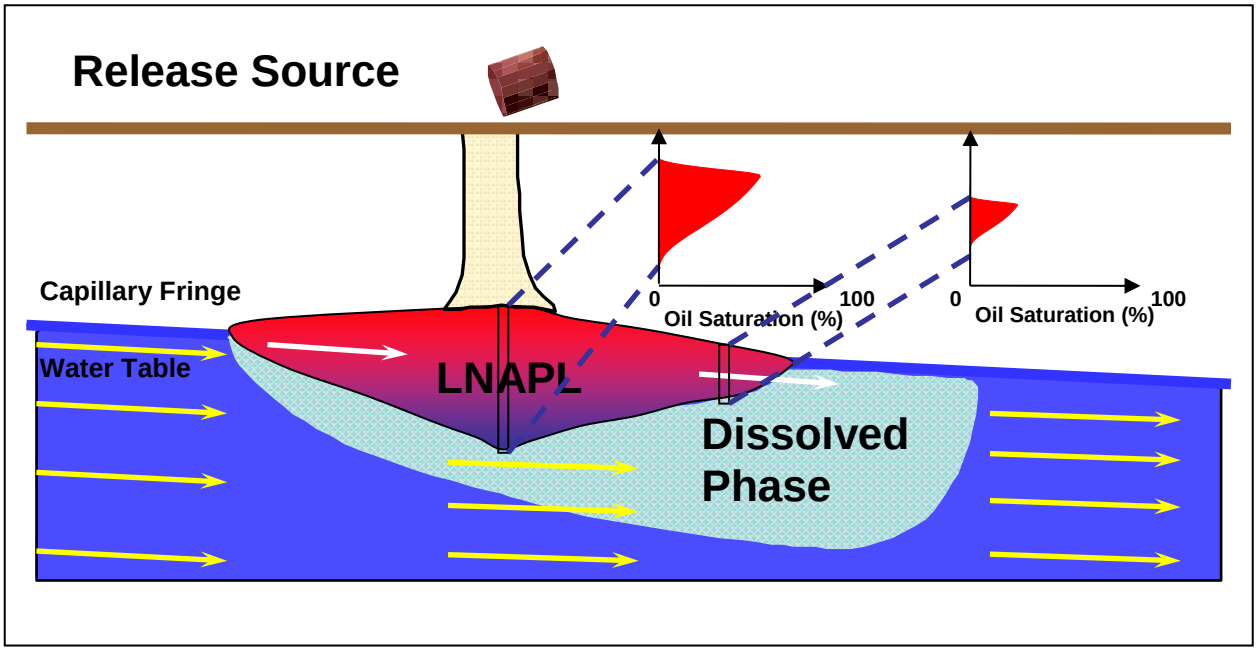


Figure 5 LNAPL Saturation Profile Changes with Respect to Location Within LNAPL Body



As previously discussed, geology plays an extremely important role with respect to LNAPL saturation. Figure 6 illustrates how LNAPL saturation profiles differ for varying types of soil (due to differences in soil pore size). Figure 7 illustrates how saturation profiles differ for a given soil with varying in-well LNAPL thicknesses.

Figure 6 LNAPL Saturation Profiles in Different Soil Types for a Given In-Well LNAPL Thickness

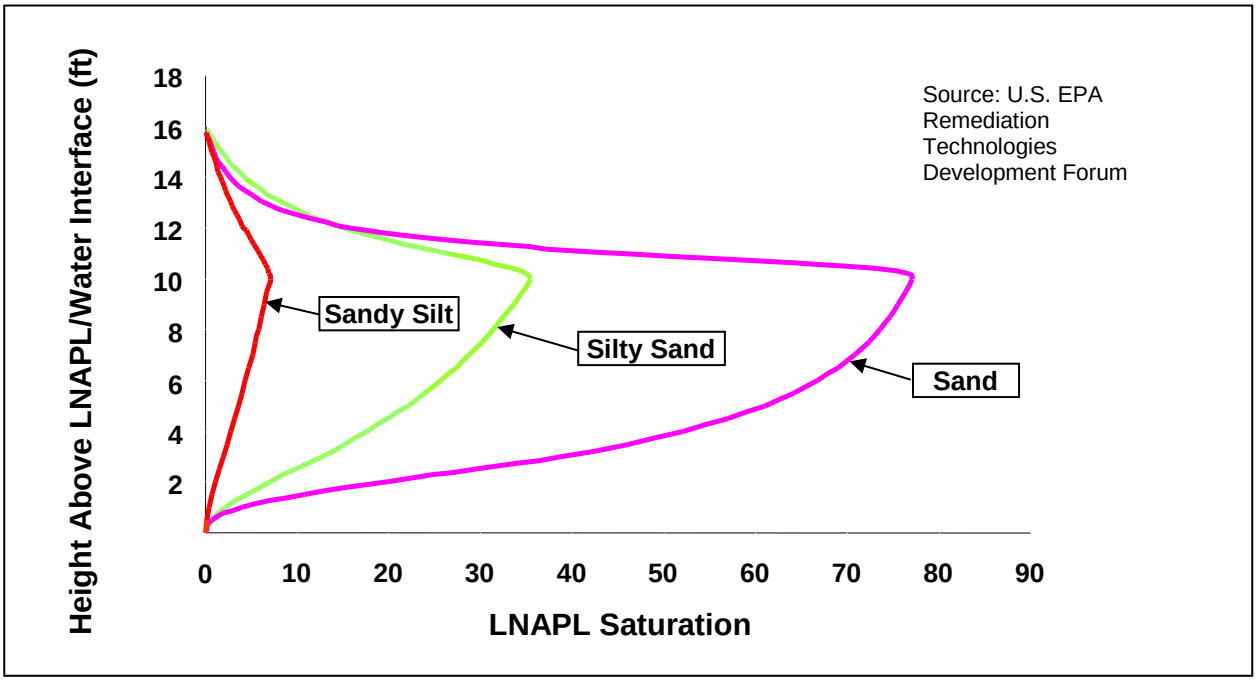
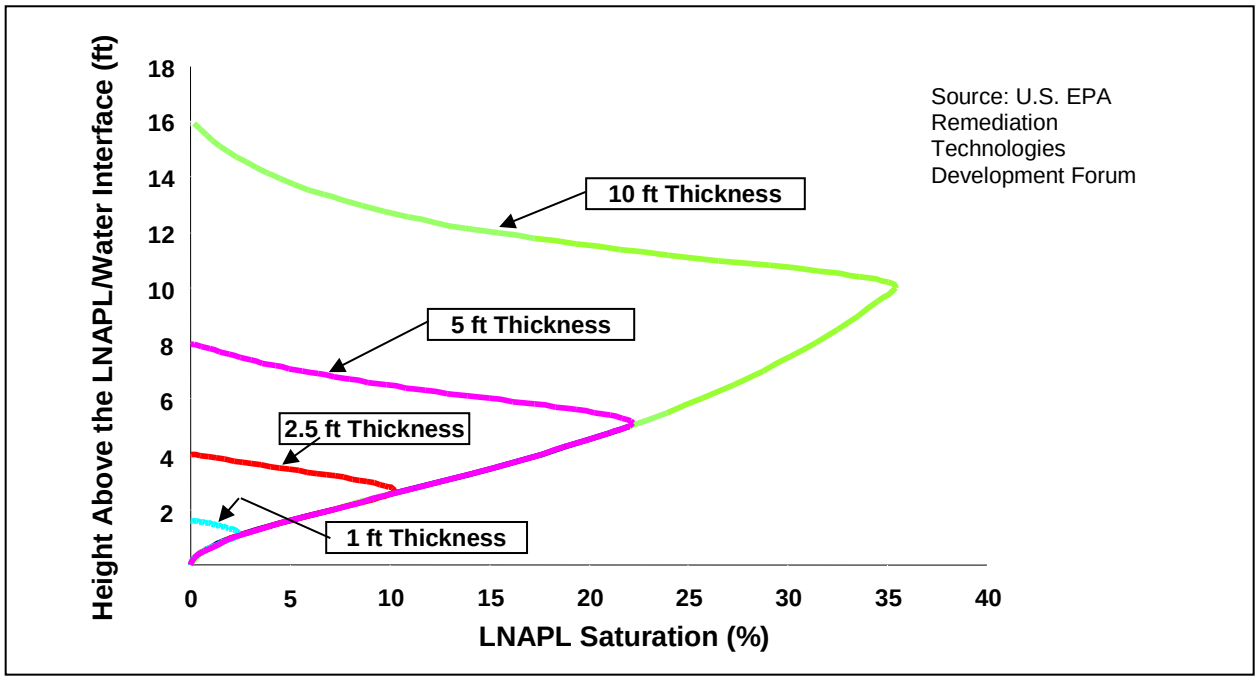


Figure 7 LNAPL Saturation Profiles for a Given Soil with Varying In-Well LNAPL Thicknesses



Again, capillary pressure predictions for LNAPL saturation profiles are based on idealized assumptions, which are useful from a theoretical standpoint to illustrate the multi-phase model of LNAPL occurrence and behavior. However, these assumptions will not be met at many environmental sites and in-well LNAPL thickness data will not typically provide an accurate depiction of the vertical extent of the LNAPL body in the adjacent soil. Where preferential pathways and/or other subsurface heterogeneities exist, LNAPL saturations can vary dramatically throughout an impacted zone and will be difficult or impossible to predict.

LNAPL saturations can be determined and/or measured by several methods:

1. Total petroleum hydrocarbon (TPH) soil concentrations can be converted to LNAPL saturations by the following calculation (ASTM International, 2007):

$$S_o = \frac{[TPH]}{10^6} \cdot \frac{\rho_{fb}}{\rho_o} \cdot \Theta^{-1}$$

Where:

S_o	=	LNAPL saturation (fraction of pore space filled with LNAPL)
$[TPH]$	=	total petroleum hydrocarbon soil concentration (mg/kg)
ρ_{fb}	=	soil bulk density
ρ_o	=	LNAPL/oil density
Θ^{-1}	=	total soil porosity

2. LNAPL-saturated soil core samples can be collected and tested at certain specialized petrophysical laboratories to directly determine LNAPL saturations (e.g., Dean-Stark extraction method).

3. Various tools are available from the API that can be used to estimate LNAPL saturations based on in-well LNAPL thickness observations and soil and LNAPL physical properties (i.e., the LNAPL Distribution and Recovery Model [LDRM]).

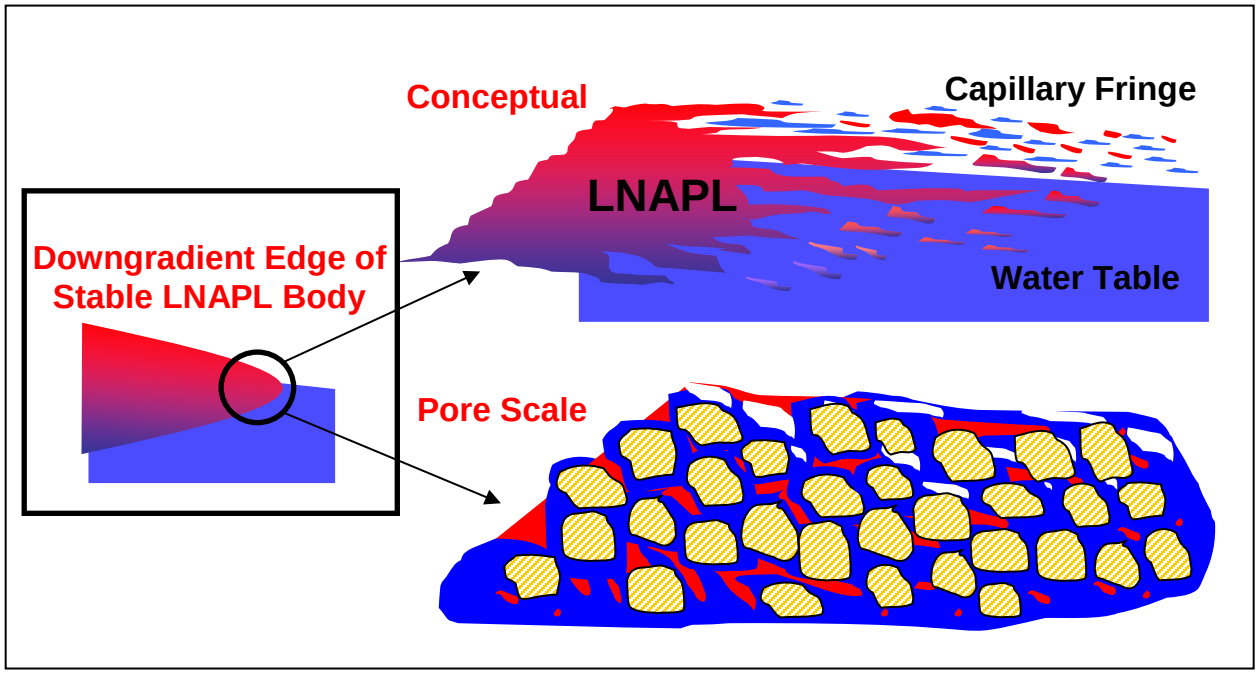
Method 3 is widely used, but generally less reliable than Methods 1 and 2 as it is primarily dependent upon in-well LNAPL thickness observations. As previously discussed, conditions at most environmental sites (i.e., water table fluctuations, subsurface heterogeneities, etc.) make any accurate correlation between in-well LNAPL thicknesses and the actual impacted interval in the adjacent soil formation difficult.

LNAPL saturations are dynamic, and will change over time as LNAPL initially displaces water (during vertical and lateral migration following a release), and is then subsequently displaced as water refills some fraction of the pore space when water table elevation increases (API, 2004). This process of vertical redistribution of LNAPL with water table fluctuations is commonly referred to as "smearing". LNAPL saturations can be expected to continue to change until such time as the LNAPL becomes sufficiently discontinuous, such that all saturations are at or below LNAPL residual saturation levels. A discussion of LNAPL residual saturation follows.

2.3 LNAPL Residual Saturation

LNAPL residual saturation is defined as the LNAPL saturation level or threshold below which LNAPL will not flow under normal hydraulic conditions. Consequently, LNAPL that is present at saturations that are less than or equal to residual saturation levels will generally be considered to be immobile and unrecoverable. Conceptually speaking, LNAPL residual saturation represents the LNAPL saturation threshold where the LNAPL, due to its relatively low saturation, starts to break-up or become discontinuous in the form of droplets, stringers, ganglia, etc. LNAPL residual saturation represents the amount of LNAPL trapped by capillary forces within the pore network that is hydraulically unable to move (Beckett, 2005). As LNAPL saturation approaches or decreases to residual, the relative permeability of the LNAPL approaches zero, and the conductivity of the LNAPL approaches zero. Figure 8 provides both a conceptual and pore scale illustration of LNAPL at residual saturation at a LNAPL body periphery.

Figure 8 Conceptualization of Discontinuous Residual LNAPL at LNAPL Body Periphery

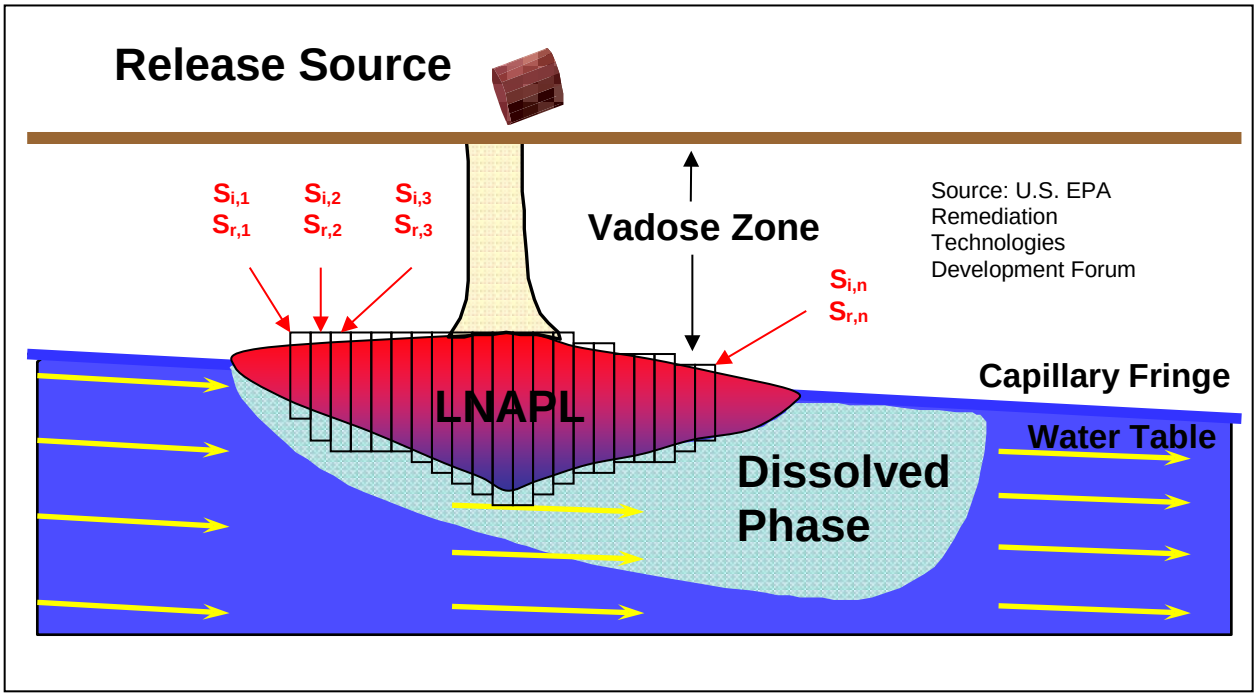


The greater the initial saturation at any point in an LNAPL body, the greater the residual saturation at that point (Johnston, C.D. and Adamski, M., 2005). In other words, the more LNAPL that initially enters a pore space, the more that will become trapped and unable to move out of the pore space. Hence, an entire LNAPL body will be comprised of a variety of initial saturation and corresponding residual saturation values depending on the reference point or location within the body (refer to Figure 9).

LNAPL residual saturation may be characterized as a "range" of saturations less than the highest residual saturation threshold value. At any given location within the LNAPL body, if the LNAPL saturation is equal to or less than the residual saturation threshold (i.e., the upper limit of residual saturation) for that location, then the saturation is deemed to be in the "residual range" which may

include any saturations above zero up to and including the residual saturation threshold. Under such conditions, the LNAPL would be deemed to be immobile.

Figure 9 LNAPL Residual Saturation as a Function of Initial Saturation



Residual LNAPL saturations can be determined by obtaining relatively undisturbed soil core samples from a site (maintained in a frozen state to prevent pore fluid drainage) and subjecting them to one of several different laboratory methods:

1. Oil/water drainage/imbibition capillary pressure testing: Involves spiking (via centrifuge) a sub-sample from the soil core with LNAPL up to its maximum saturation, then forcing water through under pressure to drain as much LNAPL as possible. Whatever LNAPL is left constitutes the residual LNAPL saturation.

2. Free product mobility testing via centrifuge at 1,000 times the force of gravity (Brady and Kunkel, 2005): Performed by taking a sub-sample from a soil core as-received (no pre-spiking with LNAPL) and spinning it in a centrifuge at 1,000 times the force of gravity (approximately equal to 40 to 50 psi applied to sample) for 1 hour. LNAPL remaining in the sample following the centrifuge represents the residual LNAPL saturation.

3. Water drive/flood testing: Involves forcing multiple (typically 10-15) pore volumes of water through a sub-sample from a soil core under 25 psi pressure. The LNAPL residual saturation is represented by the LNAPL that remains in the sample following the water drive.

Methods 1 and 2 both have aspects about the way the test is run that may result in residual saturation results that are unduly biased. For Method 1, recall that residual LNAPL saturation is a function of initial LNAPL saturation (i.e., the more LNAPL that occupies the pore space initially, the higher the residual saturation). The initial spiking of the sample with LNAPL in Method 1 may therefore produce a residual saturation result that is biased high compared with what would be

representative of an unspiked sample. With Method 2, the pressure applied during the test is so exceedingly high that it is far beyond the pressure conditions produced by typical hydraulic conditions at most sites. Furthermore, the elevated pressure utilized with Method 2 more often leads to the compression or collapse of the soil matrix during the test. When this occurs, one may not be able to conclude whether any LNAPL released from the sample during the test was the result of the applied gradient or the compression of the soil matrix "squeezing" LNAPL out of the sample. In either case, the results of Method 2 are likely to produce a residual saturation result that will be biased low and non-representative of actual site conditions, which may result in the conclusion that much more LNAPL may be recoverable at a given site than there actually is. Method 3 also involves an applied pressure that is likely to be higher than conditions at a typical environmental site; however, because the pressure is much lower than Method 2 and the method does not involve any pre-spiking of LNAPL as in Method 1, it is the method that is likely to produce the most representative results.

It is important to note that LNAPL residual saturation for a given LNAPL and soil type at a given location within the LNAPL body varies greatly between the unsaturated (vadose) and saturated zones. Generally speaking, LNAPL residual saturations in the vadose zone are much lower than corresponding residual saturations in the saturated zone. This is true because of the difference in densities between an air/LNAPL pair versus a LNAPL/water pair, and because of the difference in interfacial tensions between an air/LNAPL pair versus a LNAPL/water pair. LNAPL in the vadose zone has a much greater ability to drain under the force of gravity and flow into a monitoring well, as opposed to LNAPL that is submerged beneath the water table. Put simply, much less pressure is required for LNAPL to push air out of the way to enter a pore than would be required for LNAPL to do the same to groundwater. This also plays a role in the appearance and disappearance of LNAPL in wells resulting from fluctuations of the water table elevation. Typical LNAPL residual saturations in the vadose and saturated zones for given soil types are presented in Table 1 as follows (ITRC, 2009b):

Table 1 Representative LNAPL Residual Saturation Values for the Vadose and Saturated Zones

Soil Type	Residual Saturation (Vadose)	Residual Saturation (Saturated)
Sand	3%	25%
Sandy Loam	5%	22%
Loam	7%	18%
Silty Loam	7%	16%
Sandy Clay	7%	10%
Silty Clay	4%	6%

Note that the "saturated" residual saturation of LNAPL in a coarse grained material (sand) is much higher than the corresponding "saturated" residual saturation in a silt or clay. As previously discussed, this is due to the fact that a coarse grained soil has a much greater capacity to hold LNAPL (due to larger soil pores) than a fine textured soil. Hence, the LNAPL saturations and corresponding residual saturations in a coarse grained soil are typically much higher than the LNAPL saturations and residual saturations in a fine textured soil. As previously noted, secondary

porosity may control LNAPL flow in finer grained soils. Consequently, these typical values may or may not apply where this condition is present.

2.4 LNAPL Mobility and Body Stability

2.4.1 LNAPL Mobility

The mobility of LNAPL generally relates to its ability to move in a localized sense at any point within an LNAPL body, and does not necessarily represent a migrating LNAPL body. LNAPL mobility can be highly influenced by a fluctuating water table. The mobility of LNAPL is dependent on a variety of LNAPL properties (density, viscosity, interfacial tension) and soil properties (soil type(s) and drainage characteristics) and is often characterized in terms of LNAPL saturations (at any point within an LNAPL body) and the corresponding residual saturations. LNAPL saturations that exceed residual saturation levels indicate a potential for mobility, however, this does not necessarily indicate that the LNAPL body is migrating (ASTM, 2007; ITRC, 2009b).

Seasonal water table fluctuations have a direct impact on the mobility of LNAPL. A rising and falling water table creates a "smear zone" where mobile, continuous LNAPL becomes spread vertically and becomes discontinuous as water and LNAPL compete for pore space. Assuming a continuous source is not present, this interaction between water and LNAPL will progressively trap LNAPL as discontinuous, immobile droplets within the soil matrix over time (API, 2004). Consequently, during seasonal high water tables, some or all of the LNAPL in the smear zone (in an unconfined setting) can become submerged or trapped beneath the water table. This results in the submerged LNAPL losing much of its ability to flow through the soil matrix and/or into a monitoring well (due to a higher residual saturation in the saturated zone). In some situations, all LNAPL in a well can "disappear" with an increase in water table elevation.

The disappearance and reappearance of LNAPL in monitoring wells in response to fluctuating water table elevations is a common occurrence. During a rising water table condition, there is a delay in the response or rising of the LNAPL in the formation as buoyancy forces attempt to move the LNAPL upward through the resistance presented by the soil formation (Oostrom et al., 2006). This delay is due to the resistance to LNAPL movement provided by the soil matrix and the fact that groundwater is less viscous than LNAPL and is able to move more easily through the soil than LNAPL. The LNAPL in a well, however, does not encounter this resistance to upward movement that the LNAPL in the formation does, and will rise on top of the water in the well more quickly than the LNAPL in the formation is able to rise through the soil matrix. This creates an LNAPL gradient from the well toward the formation, resulting in LNAPL flow out of the well and, in some situations, results in all LNAPL disappearing from the well. Conversely, during seasonal low water tables, more of the LNAPL in the smear zone becomes exposed, gaining the ability to drain from the newly unsaturated soil under gravity and flow in the soil and/or into a monitoring well (due to a lower residual saturation in the unsaturated zone). This explains the reappearance of LNAPL or increases in LNAPL thickness in wells during seasonal low water tables.

The rising and lowering of the water table has a direct influence on the inherent mobility of LNAPL within an LNAPL body, but a localized increase in LNAPL mobility signified by increasing in-well LNAPL thickness does not necessarily indicate a migrating LNAPL body. Furthermore, at sites that do not have ongoing sources, changes in in-well LNAPL thickness that correlate with fluctuations in

the water table elevation are more likely to be a result of localized vertical redistribution of LNAPL in and out of the well (as described above) as opposed to being representative of any significant lateral mobility (ITRC, 2009a).

As suggested above, LNAPL thickness in a monitoring well varies inversely with water table elevation in an unconfined setting or condition. Hence, an increase in water table elevation results in a decrease in in-well LNAPL thickness. Conversely, a decrease in water table elevation results in an increase in in-well LNAPL thickness. In a confined setting (including LNAPL present in the secondary porosity of silts, clays and possible fractured rock), in-well LNAPL thickness tends to vary directly with potentiometric surface elevation. Hence, an increase in potentiometric surface elevation results in an increase in in-well LNAPL thickness, and vice versa.

It is important to note that LNAPL mobility, on its own, only defines the potential for LNAPL movement or migration, and does not explicitly define movement/migration. To define LNAPL migration, the LNAPL gradient is required in addition to LNAPL mobility (API, 2004). Further, and as previously indicated, Darcy flow in an LNAPL body only applies where there is continuous LNAPL within the body. Hence, in any areas of discontinuous LNAPL (i.e., LNAPL saturations below residual) within an LNAPL body, or outside of a stable LNAPL body, there is no LNAPL flow or movement.

2.4.2 LNAPL Body Stability

LNAPL stability relates to the ability or inability of an LNAPL body to migrate (i.e., whether or not the perimeter or extent of an LNAPL body is expanding/advancing over time). If the perimeter of an LNAPL body is growing or moving over time, the body is typically referred to as migrating or unstable. If the LNAPL body remains essentially the same size and in the same location over time (i.e., same overall footprint over time), the body is referred to as stable or non-migrating. Generally speaking, most historical LNAPL bodies where the source of the release has been terminated will be found to be stable. LNAPL bodies are spatially self-limiting unless continually supplied from an on-going release, thus distinguishing LNAPLs from dissolved and vapor plumes that may migrate significant distances (API, 2004). Typically, once the release of LNAPL stops, LNAPL in the water table region will eventually cease to move as the resistive forces in the saturated soils balance the LNAPL head (API, 2002; Huntley and Beckett, 2001). Often times, the following factors combine to produce a stable plume that is not spreading or migrating (USEPA, 2005):

- LNAPL fluid properties
- LNAPL relative permeability
- Conductivity of the porous media
- Hydraulic gradient
- Pore throat displacement entry pressure
- Fluctuating water table

For an entire LNAPL body, LNAPL will often be found to possess some localized mobility near the center of the body, where LNAPL saturations are highest (in excess of residual saturation), and

immobile at the outer body fringes where saturation decreases to residual. Hence, the overall body remains stable in spite of the presence of localized areas with a potential for mobility.

Figure 10 provides a conceptual drawing of an LNAPL body that is continuing to expand or migrate. The expanding body is represented at the periphery by bold "force" arrows, indicating that the LNAPL has sufficient pressure or head to continue displacing groundwater. Conversely, Figure 11 shows a stable LNAPL body with "force" arrows in equilibrium with the resisting force of soil and groundwater.

Figure 10 Expanding/Migrating LNAPL Body (Thick Force/Pressure Arrows Within Body Indicate Continued LNAPL Body Migration in all Directions)

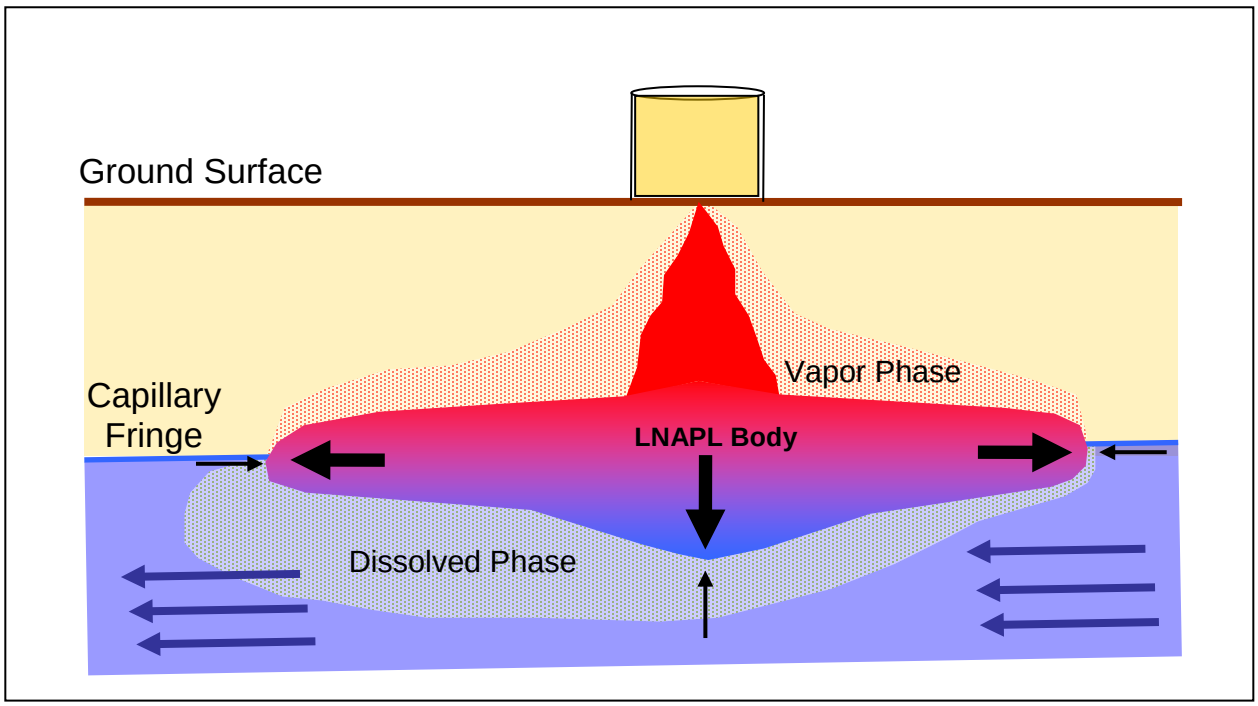
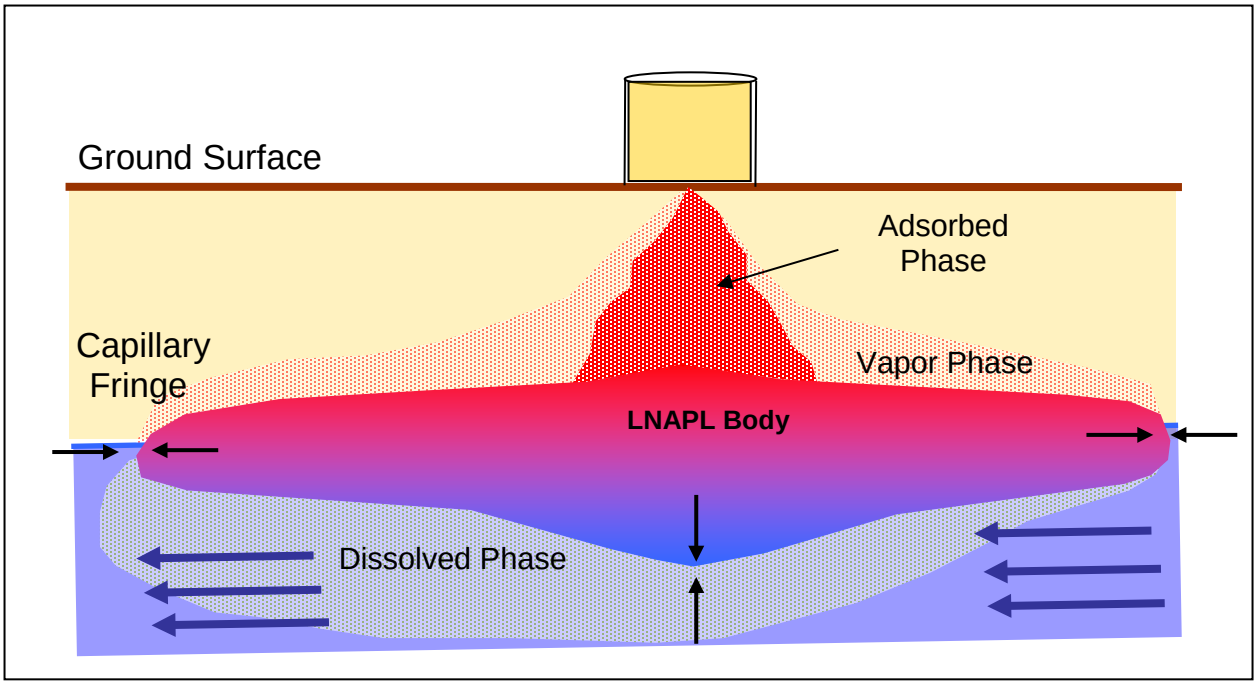


Figure 11 Stable/Non-Migrating LNAPL Body (Arrows Within and Outside of LNAPL Body Indicate Opposing Forces/Pressures are at Equilibrium)



Water table fluctuations in a stable LNAPL body may cause immobile LNAPL to become mobile in a very localized sense and flow or drain into an immediately adjacent monitoring well. However, although there may be some limited LNAPL drainage and vertical redistribution or smearing, the LNAPL body is still likely to be stable and non-migrating. Hence, at a site with a stable LNAPL body (i.e., no continuing LNAPL release), the disappearance of LNAPL from a monitoring well for months and/or years, followed by the reappearance of LNAPL does not necessarily mean that the LNAPL is migrating.

3. Lines of Evidence for Evaluating LNAPL Mobility and Body Stability

There are various potential lines of evidence that can be used to evaluate the mobility and stability of an LNAPL body. These lines of evidence are:

- Historical LNAPL-related data (depth to LNAPL/water levels, in-well thicknesses, stable or shrinking dissolved-phase plume associated with LNAPL body, recovery data, etc.)
- Site-specific laboratory data (TPH profiling, LNAPL saturations in soil cores, etc.)
- LNAPL modeling (analytical and/or numerical) simulations
- Dye tracer testing
- Combinations of the above

A weight of evidence approach is preferred since the complexities of the evaluation of LNAPL mobility at real environmental sites will make it unlikely that any single line of evidence can be definitive. The potential lines of evidence are discussed in the following subsections.

3.1 Historical LNAPL-Related Data and Observations

3.1.1 In-Well LNAPL Thicknesses and Other LNAPL Spatial Distribution Information

Typically, the first line of evidence for evaluating LNAPL mobility and body stability is historical data regarding the spatial distribution of the LNAPL body. Historical LNAPL spatial distribution data are typically based on "in-well" or "apparent" LNAPL thicknesses, but may also include more sophisticated LNAPL site characterization data such as laser-induced fluorescence (LIF) results. Historical LNAPL data are the primary line of evidence when the dataset includes measurements obtained at regular intervals over an extended period where in-well thicknesses can be assessed during both high water table and low water table conditions. Depending on the site conditions, high and low water tables may be assessed seasonally within a 12-month timeframe or may require a period of years for proper evaluation. Generally speaking, if the position, orientation and size of the LNAPL body remain similar during low water table conditions over extended periods of time, the LNAPL body is likely to be stable. However, care needs to be exercised in the evaluation of in-well thickness trends as these data will not provide a valid representation of the mobility and/or stability of the LNAPL body at many environmental sites. Monitoring well observations that may indicate the presence of mobile LNAPL include the following:

- LNAPL appearing in a well that exhibited no previous evidence of the presence of LNAPL (from field soil screening, soil/groundwater analytical results, LIF results, etc.)
- The footprint or perimeter of in-well LNAPL observations appears to continue to expand in one or more directions over time (when comparing observations made during low water table conditions)
- Where unconfined conditions are present, increasing in-well LNAPL thicknesses <u>without</u> a corresponding site-wide drop in water table elevation

Conversely, the following well observations are likely to represent immobile LNAPL or a stable LNAPL body:

- LNAPL never appearing in a well, even though other evidence suggests its presence (field soil screening, soil/groundwater analytical results, LIF results, etc.)
- In-well thickness fluctuations corresponding with water table fluctuations (e.g., a drop in water table elevation of "x" feet results in an in-well LNAPL thickness increase of approximately "x" feet)
- The footprint or perimeter of in-well LNAPL observations appears to maintain approximately the same areal extent over time

3.1.2 Dissolved Phase Concentration Trends

A stable or diminishing dissolved phase plume is also an indication that the LNAPL source area is stable. Hence, dissolved phase monitoring data may also be used to assess LNAPL body stability. A comprehensive groundwater monitoring program will involve examining data from multiple wells over a sufficient duration to encompass the range of seasonal/temporal variation in hydraulic conditions. Ideally, a suitable monitoring network will include source zone, up-gradient, down-gradient and cross-gradient wells (i.e., a minimum of 4 to 5 wells). For the purpose of evaluating trends in analyte concentrations over time in groundwater sampled from monitoring wells, graphing trends or statistical analyses can be completed. In addition, other techniques based on areal and temporal changes in data over time as opposed to focus on results at individual wells can be used to evaluate stability (e.g., Ricker method).

3.1.3 LNAPL Recovery Data

Performance data from LNAPL recovery efforts can provide valuable information on the potential mobility of the LNAPL. If an appropriate LNAPL recovery technique has been applied and effectively operated at a given site, a low recovery rate or the development of an asymptotic recovery rate trend over time is a strong indication that the LNAPL is (or has become) immobile (i.e., if it cannot be recovered under some type of applied hydraulic and/or pressure gradient, it isn't likely to be moving in the absence of the applied gradient). Conversely, if sufficient quantities of LNAPL can be readily recovered, then the LNAPL likely has some mobile component. The following graphical techniques can be used to assess an LNAPL recovery effort:

- Plot of cumulative recovery and recovery rates over time: A slope that is trending toward zero in a cumulative recovery plot and an asymptotic trend in a recovery rate plot both indicate that a recovery system has passed the point of diminishing returns. That is, the bulk of the recoverable LNAPL has been recovered and the remaining LNAPL is likely to possess little or no potential for mobility. Examples of a flat cumulative recovery curve and an asymptotic recovery rate trend are provided on Figure 12.
- Decline Curve analysis: Can be used to estimate the recoverable volume of LNAPL remaining at a site (based on recovery system performance data). In a Decline Curve, recovery rate is plotted against cumulative recovery. During the latter stages of a remediation, the shape of the curve will typically become sufficiently linear that a best-fit line can be projected to intersect the x-axis. In this type of analysis, the x-intercept represents the maximum recoverable volume of LNAPL (based on current remediation system configuration and operating conditions). If the result of a Decline Curve analysis indicates that limited recoverable LNAPL remains at a site, one can also conclude that the mobility of the remaining LNAPL is likely to be limited. An example Decline Curve plot is provided on Figure 13.

Figure 12 Example of Asymptotic Recovery Rate Trend and Diminishing Returns

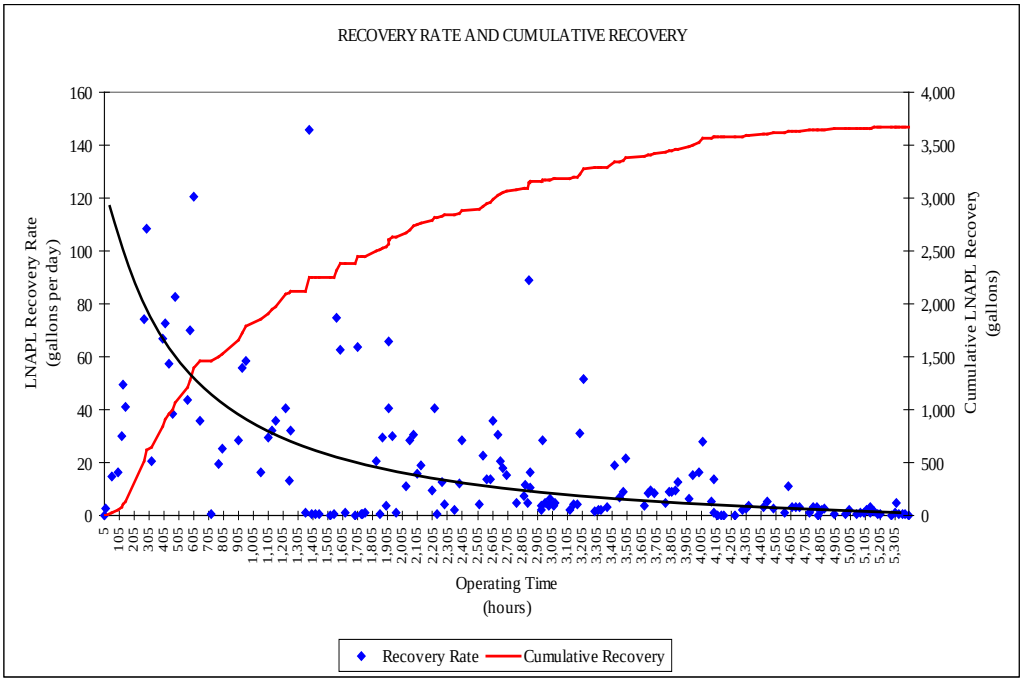
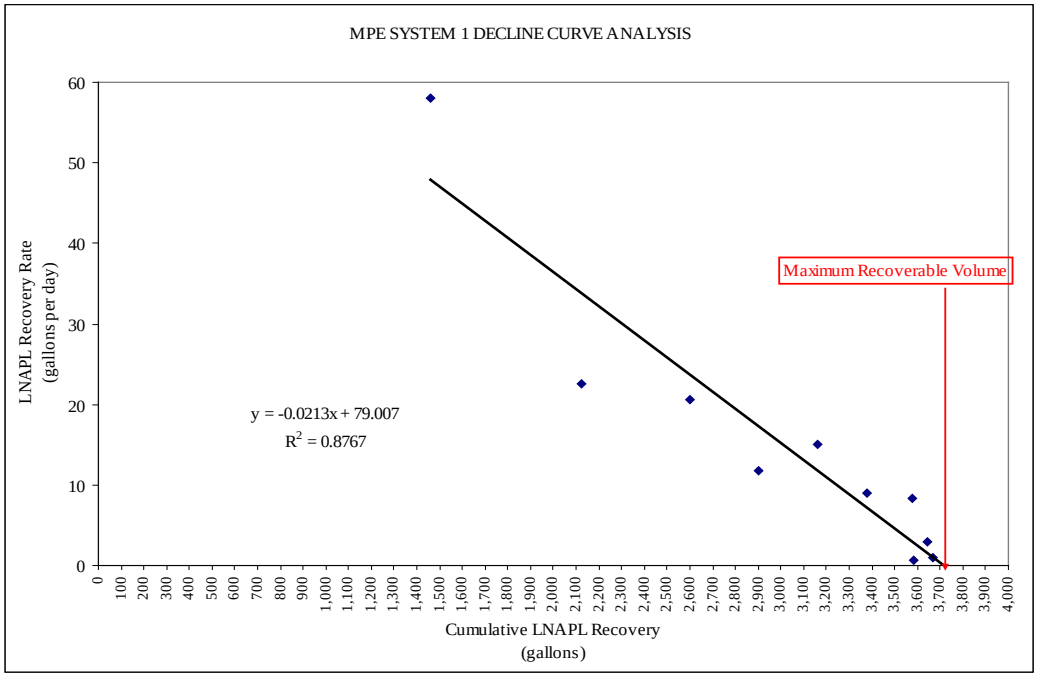


Figure 13 Example Decline Curve Analysis



3.2 Site-Specific Laboratory Data

LNAPL-saturated soil cores from impacted areas within an LNAPL body may be collected and submitted for laboratory petrophysical analyses. Such evaluations may include some or all of the following:

- Photographs of LNAPL-saturated undisturbed soil cores in both natural light and ultraviolet light
- Soil physical property evaluation in the anticipated LNAPL saturated zones including grain size analysis and drainage characteristics (van Genuchten parameters)
- Laboratory fluid (water and LNAPL) saturation analyses to determine Site-specific saturations and residual saturations across the LNAPL body
- LNAPL fluid property testing for density, viscosity, and interfacial tensions

A comparison of saturation versus residual saturation values across an LNAPL body can be used to assess the mobility of the plume. In addition, the site-specific laboratory results may be incorporated as site-specific model inputs to assess LNAPL mobility (see description below).

3.3 LNAPL Modeling

There are various LNAPL analytical models (e.g., LNAST, LDRM, etc.) that may be used to evaluate LNAPL mobility. These analytical models are based on a number of assumptions including: the fluids (LNAPL and water) are in vertical equilibrium and the soil conditions are relatively homogeneous. These conditions are required for in-well or apparent LNAPL thicknesses to be considered representative of the spatial (vertical) distribution of LNAPL in the formation. Situations where these conditions are not met include sites with (Johnson and Ling, 2005):

- Water table fluctuations
- Confined conditions
- Sump wells in a perched setting
- On-going LNAPL release
- Heterogeneous conditions

Although in a real world setting, there are often times when vertical equilibrium of liquids and homogeneous soil conditions do not exist, LNAPL models may still be used to generate qualitative information about LNAPL behavior. However, it is noted that the core assumption of these analytical models that in-well LNAPL thickness is representative of the vertical extent of impacts in the adjacent soil will not be met at most sites. In general, the degree to which model results are quantitatively valid and defensible will be based on actual site conditions and the accuracy of the LCSM. Where possible, the use of site-specific model inputs (as determined from field and/or laboratory testing) is preferred over the use of default literature look-up values.

3.4 LNAPL Transmissivity

The evaluation of LNAPL transmissivity provides standardized quantitative information (not dependent on soil types or LNAPL extraction method) relating to the mobility and recoverability of

the LNAPL. Field testing can be performed according to various techniques from simple short-term manual methods to the interpretation of long-term recovery data of complex remediation systems. The methodologies for both field testing and data processing are detailed in ASTM International Standard E2856-13 *Standard Guide for Estimation of LNAPL Transmissivity* (April 2013). Additional information and analytical tools are provided in the American Petroleum Institute's *LNAPL Transmissivity Workbook: Calculation of LNAPL Transmissivity from Baildown Test Data* (September 2012). Results are typically compared against a de minimis recoverability criterion such as ITRC's 0.8 ft^2/day (ITRC, 2009a) to make determinations on the potential mobility and feasibility of hydraulic recovery of the LNAPL at a given Site.

4. LNAPL Mobility Assessment

The following multiple lines of evidence were used to assess LNAPL mobility at the Site:

- LNAPL Distribution
- LNAPL Types and Age
- LNAPL Remedial History
- API LNAPL Distribution and Recovery Model

Figure 14 presents a Site map for AOI 6.

4.1 LNAPL Distribution

A primary line of evidence for evaluation of LNAPL plume stability and mobility is observational data. If observational data indicates that the LNAPL plumes are stable or shrinking, the potential for LNAPL mobility is low. LNAPL is deemed to be potentially migrating when:

- Fluid level gauging over time indicates that the apparent LNAPL thickness is increasing within monitoring wells in a manner not attributable to seasonal water-table fluctuations
- LNAPL is identified in a portion of the monitoring well network that has historically lacked measurable LNAPL and there is no evidence that a respective location was previously impacted by petroleum/LNAPL (e.g., in well logs, soil sampling results, etc.)

The accumulation of LNAPL in monitoring wells is a primary line of the presence of LNAPL that may be considered hydraulically mobile/recoverable. However, LNAPL that enters a monitoring well will only represent a small fraction of the LNAPL present in the aquifer (USEPA, 2005) and will often not accurately represent the vertical extent of LNAPL (or smear zone) in the adjacent soil. Due to this difference, the LNAPL thickness measured in a monitoring well is referred to as an apparent NAPL thickness (ANT).

There are many common misconceptions with regard to the in-well LNAPL thickness (ITRC, 2009a). The following points outline the correct concepts:

- The absence of LNAPL in a monitoring well does not mean that LNAPL is not present in the screened aquifer, rather it is a reflection of the saturation level.

- The presence of LNAPL in a monitoring well does not necessarily mean that the LNAPL plume is migrating or has the potential to migrate.
- Apparent LNAPL thickness in a well is not a good predictor of the potential LNAPL mobility or rate of LNAPL recovery.

The thickness of LNAPL observed in the monitoring wells depends on a number of factors such as the geology and water table fluctuations. A falling water table for an unconfined system typically results in greater observed LNAPL thickness in the monitoring wells as a result of drainage from the unsaturated zone. The effect of a falling water table is more pronounced for coarse-grained than fine-grained soils. Identification of trends in ANT is complicated and must consider any natural or artificially-induced changes in hydraulic conditions to be meaningful. Therefore, discussing in-well LNAPL thickness changes/trends without providing the context of water table elevation changes may lead to incorrect interpretations of the data.

4.1.1.1 Precipitation

Figure 15 presents a graph of the cumulative deviation of precipitation from the long term average from 1980 through November 2016 based on weather data from the National Oceanic and Atmospheric Administration (NOAA) station located at the Philadelphia International Airport (NOAA, 2016). As indicated on Figure 15 and discussed in previous investigation reports, a long term drought occurred in the late 1990s and early 2000s in the area of the Site. Since 2008, precipitation has generally been higher than average. Precipitation data from 2016 indicates that this year will fall below the long term average. Overall, groundwater elevation in Site wells has generally increased or remained stable since 2008. Note that groundwater elevation response to seasonal fluctuations in precipitation, depicted as water level oscillations within a single year, are also apparent in many of the hydrographs.

4.1.1.2 Well Construction

In an unconfined setting, submerged screens may prevent LNAPL from entering a well. Review of well construction records for the Site identified wells with screens that are regularly or sporadically submerged. Of these wells, 24 are screened in the unconfined aquifer. These wells are listed in Table 2**.** Note that the wells with submerged screens were excluded from analysis during the LNAPL mobility assessment unless the well screen was only sporadically submerged.

4.1.1.3 Trend

Numerous monitoring wells across the Site have been gauged for LNAPL over the course of the investigation and remediation history. Table 3 of this LCSM presents a summary of unconfined well gauging throughout the monitoring record. Hydrographs of AOI 6 wells (Appendix F.1) include corrected groundwater elevation, ANT, and well construction details (top and bottom well screen elevations). Appendix F.1 also includes Diagnostic Gauge Plots (DGPs) for the wells with LNAPL, which were produced as they can provide a more clear indication of the interplay between LNAPL and the water table then the more typical hydrographs. The DGPs were developed by plotting fluid interface elevations (air/LNAPL and LNAPL/water interfaces measured in a well) and in-well LNAPL thickness against corrected water table elevation. This approach takes the same data used in the development of the hydrographs and plots it in such a way as to linearize the datasets and more

clearly describe whether the relationship between in-well LNAPL thickness changes and water table fluctuations is direct (confined LNAPL) or inverse (unconfined or perched LNAPL).[1] The historical limit of groundwater gauging data in the Site database, used as a basis for this report, is December 1995.

In 2005, LNAPL has been detected in 45 percent of the wells gauged within the limits of AOI 6. In May 2016, LNAPL was detected in 22 percent of the wells gauged within the limits of AOI 6. A well gauging summary is presented on Table 4. A summary of the interpretation of the hydrograph and DGP results is provided below:

- Most of the LNAPL at AOI 6 is present under unconfined conditions. Some wells exhibited confined LNAPL behavior, and some wells exhibited inconclusive results/no trend due to very small in-well LNAPL thicknesses and/or infrequent LNAPL observations. Changes in in-well LNAPL thickness over time generally correlate with changes in water table elevation.
- There were no wells that had LNAPL in 2017 that have not had it historically.

Taken together, the preceding observations support that the LNAPL is stable.

4.1.1.4 Dissolved Phase Trends

The graphs in Appendix F.1 summarize the groundwater trends for the data with concentrations exceeding the groundwater PADEP non-residential statewide health standards (SHS) during the 2016 groundwater sampling. Appendix F.4 summarizes the dissolved concentrations over time in the monitoring wells in AOI 6. Appendix J of the main report contains the historical groundwater data for AOI 6. These data support that groundwater dissolved concentrations in areas with LNAPL have concentrations that are stable to decreasing for the dissolved constituents present at elevated concentrations, which further supports that the LNAPL is stable.

4.2 LNAPL Types and Age

4.2.1 LNAPL Types

The sources of the LNAPL within AOI 6 are equivocal. Numerous potential sources have historically been present at within AOI 6. Historically, AOI 6 consisted of numerous above ground storage tanks (ASTs) containing benzene, toluene, naphtha and other fuel stocks. A sulfuric acid plant was located along the northern boundary of the AOI. A gasoline treating unit, two reformer units, a BDDA (soap) unit, and a thermal hydro-dealkylation unit were also located in this area. Currently, AOI 6 consists of Udex and cumene units, reformer, tankage, boiler-houses and associated feed water treatment, maintenance buildings, lay-down yards, office buildings, the # 2 oil-water separator, remote Laboratory and new Scale House.

Below is a summary of the generalized LNAPL characterization types used to characterize LNAPL present at the Site (Light and Heavy Distillate descriptions are included for reference within the context of the PES Complex).

[1] More information on DGPs can be found at http://www.h2altd.com/wp-content/uploads/2011/02/ANSR-v1i2.pdf.

- **Light Distillates** include liquid petroleum gas (LPG), gasoline, and naphtha. LNAPL types grouped into the light distillate category include samples that have been primarily characterized as gasoline, heavy virgin naphtha or reformed light naphtha. The primary components included in these products generally have carbon numbers between 3 and 10.
- **Mixes of Light/Middle Distillates** include samples that were characterized to be intermediate mixes of light and middle distillate products. The light/middle distillate samples had an average density of 0.81 grams per milliliter (g/ml).
- **Middle Distillates** include kerosene, jet fuel, diesel fuels, and light (#2) fuel oils. The LNAPL types grouped into the middle distillate category include samples that were characterized to be primarily middle distillate or that include significant proportions of coker naphtha mixed with middle distillate. The primary components included in these products generally have carbon numbers between 9 and 20. The middle distillate samples had an average density of 0.86 g/ml.
- **Heavy distillates** include heavier (#4 and #6) fuel oil and heavy atmospheric gas oil. The LNAPL types grouped into the heavy distillate category include samples that were characterized as lubricating oil, residual oil, and heavy distillate. The primary components included in these products have carbon numbers between 14 and 40.

Table 11 of the RI Report summarizes available, historical and recent LNAPL characterization results. The results have been grouped into the following three generalized LNAPL types for the Site and adjacent areas: Mixes of Light/Middle Distillates, Middle Distillates, and Heavy Distillates. More than half of the LNAPL samples collected from AOI 6 were characterized as Middle Distillates; the remaining were characterized as mixtures of Light/Middle Distillates. The LNAPL plumes at AOI 6 are expected to be made up of various combinations of these products. Numerous samples have been collected over the period of record to characterize the LNAPL at the AOI 6. The results are summarized in Table 9 of the RI Report, and are discussed below.

A total of eight LNAPL samples have been collected, between 2004 and 2016 in AOI 6 for analysis, in order to classify the generalized LNAPL type/sub-type and degree of weathering, and to quantify the product density. Analytical LNAPL sample data packages are provided in Appendix F.2. LNAPL characterization samples collected from AOI 6 have indicated a range of weathering from severe to extreme. Figure 16 presents the locations and a summary of characterization data.

4.2.2 Age

In general, the driving mechanism for LNAPL migration is the LNAPL head that exists during and shortly after a release. It is commonly believed that the hydraulic gradient "causes" LNAPL to spread. However, the reality in most cases is that the hydraulic gradient will not cause LNAPL spreading; rather, it will only influence the preferred direction of spreading where a sufficient LNAPL head exists to drive the migration. Experience has shown that the LNAPL head will dissipate relatively quickly following the cessation of a release, with most LNAPL bodies achieving overall stability (stable perimeter/footprint) within a few years. Localized areas of mobile/recoverable LNAPL may still exist within an LNAPL body at this point; however, the overall footprint of the LNAPL body will not expand further.

The older the LNAPL body, the more likely it will be stable. This is due to a combination of the following factors:

- The dissipation of the LNAPL head.
- Seasonal fluctuations in the water table that will smear the LNAPL or spread the now fixed volume of LNAPL over larger vertical extents over time. Smearing causes a progressive decrease in localized LNAPL saturations and, consequently, is a fundamental factor in the progressive stabilization of an LNAPL body.
- Natural losses (dissolution, volatilization, biodegradation) that serve to deplete LNAPL mass, decrease LNAPL saturations and increase viscosity over time.

Based on the fact that the LNAPL is the result of historical releases (i.e., nothing recent), and the levels of degradation/weathering evident in LNAPL analytical results, the LNAPL within AOI 6 would be expected to be stable overall (i.e., not migrating now and not possessing the head to migrate in the future). Additional lines of evidence already discussed pertaining to LNAPL mobility/recoverability also lend themselves to a conclusion of overall LNAPL stability, with the age of the LNAPL adding certainty to this assessment.

4.3 Remedial System Operation

One system has operated within AOI 6 at various intervals throughout the Site monitoring and remedial history, influencing groundwater elevations and ANT in nearby wells. The 27 Pump House Total Fluids Recovery System was installed in November 2001, the system included 12 total fluid recovery wells in the vicinity of the former 27 Pump House. The 27 Pump House Total Fluids Recovery system was turned off September 20, 2010 due to absence of recoverable LNAPL. Passive remediation began on October 10, 2010 with the installation of absorbent socks in wells B-124, B-132, B-137, B-139, B-142, B-143, and B-147. Based on limited recoverable LNAPL in the proximal wells, passive remediation was discontinued on January 26, 2015. It is noted that this provides strong evidence that the remaining LNAPL is immobile/unrecoverable and stable in overall extent: if LNAPL cannot be induced to move to wells and be recovered under applied gradients, it is very unlikely to do so under normal hydraulic conditions.

4.4 API LNAPL Distribution and Recovery Model

The API LDRM (API, 2007) was used to estimate the specific (total) LNAPL volume, the potentially recoverable LNAPL volume, the percentage of the total LNAPL that might be recoverable, and the LNAPL transmissivity. Additionally, graphical model output in the form of the modelled LNAPL saturation profile is included in Appendix F.3.

Model input parameter selection and results are summarized in Tables 1 and 2 in Appendix F.3. A single model run was performed for location B-129 as a worst-case since it was by far the largest in-well thickness in 2017 (in-well LNAPL thickness being the key LDRM input used to define the vertical extent of LNAPL in the formation). The LDRM results presented in Appendix F.3 indicate:

- Approximately 4 percent of the LNAPL volume in place may be mobile/recoverable. In other words, approximately 96 percent of the LNAPL is present as hydraulically unrecoverable residual.

- LNAPL transmissivity is estimated to be on the order of 0.01 square feet per day (ft^2/day), which is well below the de minimis recoverability range of 0.1 to 0.8 ft^2/day suggested by the Interstate Technology & Regulatory Council.

Since the main model input is in-well thickness, all other wells with smaller in-well thicknesses would likewise have smaller mobile/recoverable fractions and smaller LNAPL transmissivities estimated by LDRM. The LDRM results therefore suggest that all wells with LNAPL in AOI 6 exhibit de minimis LNAPL transmissivity, and support the other lines of evidence already presented indicating general immobility and overall stability of the LNAPL.

5. Summary and Conclusions

This report documents the LNAPL CSM for AOI 6 of the Philadelphia Refinery Complex. The objective of the LNAPL mobility assessment was to evaluate if remaining LNAPL is residual, mobile, or migrating. The following -lines of evidence presented herein agree in indicating that the LNAPL is largely present as hydraulically immobile and unrecoverable residual that is stable in overall extent:

- Historical well gauging data
- Historical LNAPL recovery performance
- Age of the LNAPL
- Dissolved phase trends
- API LDRM results

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0 150 300 450
Feet

Coordinate System:
NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Legend

- 2016 RI Groundwater Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Piezometer
- 2016 RI Soil Sample
- 2017 RI Soil Sample
- Historical Soil Sample
- 2016 RI (Not Sampled)
- 2016 RI (Attempted Sample Location)
- Air Sample
- Bulkhead
- Tank
- Tank Addressed in SCR/RACR 2017
- Solid Waste Management Unit
- Area Of Interest

Original Size
ANSI D

Bar is one inch on original size drawing
0 1"

Project : 11109613

Date: Nov 21, 2017

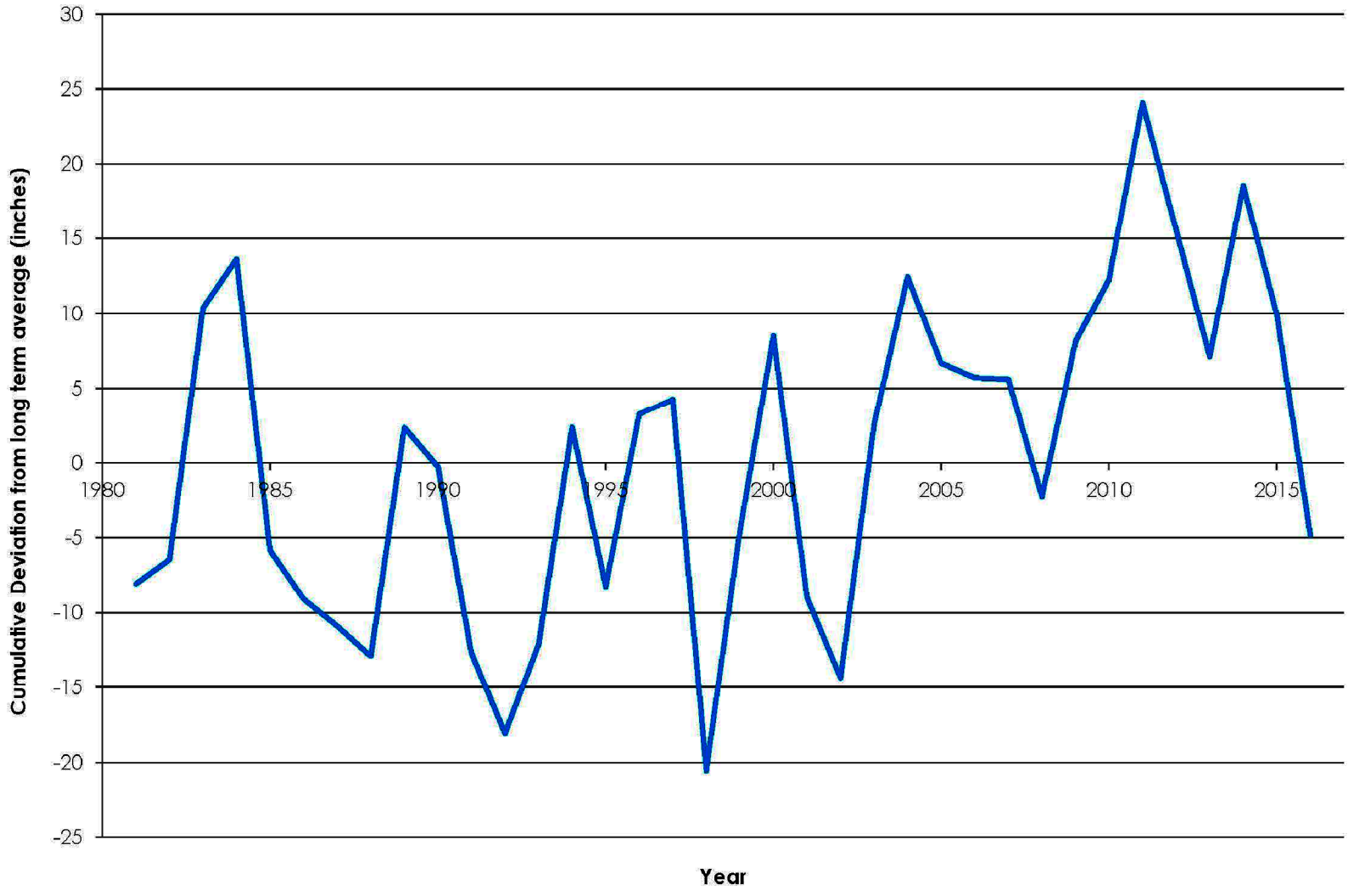
EVERGREEN RESOURCES MANAGEMENT
AOI-6 PHILADELPHIA REFINERY OPERATIONS

AOI 6 SITE PLAN

Figure No.

FIGURE 14

GIS File: Q:\GIS\PROJECTS\11109000s\11109613\Layouts\002\11109613-00(002)GIS-OT025.mxd



Source: Remedial Investigation Report, Area of Interest 4, Philadelphia Refinery Complex (Stantec, 2017)

EVERGREEN RESOURCES MANAGEMENT
AOI-6 PHILADELPHIA REFINERY OPERATIONS
AOI 6 SITE PLAN

PRECIPITATION CUMULATIVE DEVIATION FROM LONG TERM AVERAGE

11109613
Oct 16, 2017

FIGURE 15

GIS File: Q:\GIS\PROJECTS\11109000s\11109613\Layouts\002\11109613-00(002)GIS-OT022.mxd

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date June 2014, Accessed: 2017

0 100 300ft

LEGEND

● B-174 SAMPLE LOCATION

0.00 LNAPL APPARENT THICKNESS (ft.) (MAY 2017)

● LNAPL PRESENT

NOTE: NAPL TYPE AND WEATHERING INFORMATION SUPPLIED FROM STANTEC DATABASE, 2017.

GHD

EVERGREEN RESOURCES MANAGEMENT OPERATIONS LLC
PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA
REMEDIAL INVESTIGATION REPORT

LNAPL CHARACTERIZATION SAMPLES
(GENERALIZED LNAPL TYPE AND WEATHERING)

11109613-01
Nov 21, 2017

FIGURE 16

CAD File: P:\drawings\11109000s\11109613\11109613-reports\11109613-01(002-APPF)\11109613-01(002-APPF)GN\11109613-01(002-APPF)GN-WA001.dwg

Table 2

List of Wells with Submerged Screens
Philadelphia Refining Complex, AOI 6

Well ID	Apparent LNAPL Thickness Observed	Hydrostratigraphic Unit
B-134		Shallow
B-135	Y	Shallow
B-136	Y	Shallow
B-142	Y	Shallow
B-143	Y	Shallow
B-146		Shallow
B-147	Y	Shallow
B-148	Y	Shallow
B-149		Shallow
B-150	Y	Shallow
B-153		Shallow
B-155		Shallow
B-156		Shallow
B-157		Shallow
B-158		Shallow
B-160		Shallow
B-161	Y	Shallow
B-163		Shallow
B-164		Shallow
B-172		Shallow
B-173		Shallow
B-94		Shallow
WP9-1		Shallow
WP9-4		Shallow
B-132D		Deep
B-133D		Deep
B-134D		Deep

Note:

Y Indicates measurable apparent thickness of LNAPL which has been observed in well.

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-115		5/11/2017	3.14	0.52				4.36	7.5	4.88				-	Stick Up		MW	
B-115		5/11/2016	2.47	-0.15				5.03	7.5	4.88				-	Stick Up		MW	
B-115		5/4/2016	2.33	-0.29				5.17	7.5	4.88				-	Stick Up		MW	
B-115		5/15/2015	3.86	1.24				3.64	7.5	4.88				-	Stick Up		MW	
B-115		12/4/2014	2.8	0.18				4.7	7.5	4.88				-	Stick Up		MW	
B-115		5/14/2014	2.68	0.06				4.82	7.5	4.88				-	Stick Up		MW	
B-115		10/16/2013	3.47	0.85				4.03	7.5	4.88				-	Stick Up		MW	
B-115		3/28/2013	3.43	0.81				4.07	7.5	4.88				-	Stick Up		MW	
B-115		5/9/2012	2.43	-0.19				5.07	7.5	4.88				-	Stick Up		MW	
B-115		5/18/2011	3	0.38				4.5	7.5	4.88				-	Stick Up		MW	
B-115		7/29/2010						NA	7.5	4.88				-	Stick Up		MW	
B-115		6/22/2009	2.42	-0.2				5.08	7.5	4.88				-	Stick Up		MW	
B-115		11/25/2008	3.66	1.04				3.84	7.5	4.88				-	Stick Up		MW	
B-115		6/6/2008	3.14	0.52				4.36	7.5	4.88				-	Stick Up		MW	
B-115		11/15/2007	3.12	0.5				4.38	7.5	4.88				-	Stick Up		MW	
B-115		6/4/2007	3.15	0.53				4.35	7.5	4.88				-	Stick Up		MW	
B-115		11/7/2006						NA	7.5	4.88				-	Stick Up		MW	
B-115		5/24/2006	3.27	0.65				4.23	7.5	4.88				-	Stick Up		MW	
B-115		5/19/2005	4.19	1.57				3.31	7.5	4.88				-	Stick Up		MW	
B-115		10/8/2004	2.49	-0.13				5.01	7.5	4.88				-	Stick Up		MW	
B-115		11/24/2003	3.41	0.79				4.09	7.5	4.88				-	Stick Up		MW	
B-115		10/31/2002	2.78	0.16				4.72	7.5	4.88				-	Stick Up		MW	
B-115		11/8/2001	4.69	2.07				2.81	7.5	4.88				-	Stick Up		MW	
B-115		11/9/2000	4.4	1.78				3.1	7.5	4.88				-	Stick Up		MW	
B-115		11/18/1999	3.91	1.29				3.59	7.5	4.88				-	Stick Up		MW	
B-115		11/12/1998	3.68	1.06				3.82	7.5	4.88				-	Stick Up		MW	
B-115		11/13/1997	3.43	0.81				4.07	7.5	4.88				-	Stick Up		MW	
B-115		11/18/1996	3.26	0.64				4.24	7.5	4.88				-	Stick Up		MW	
B-115		12/18/1995	3.43	0.81				4.07	7.5	4.88				-	Stick Up		MW	
B-116		5/11/2017	5.89	7.15				-0.82	5.07	6.33				-	Flush		MW	
B-116		8/19/2016						-0.69	5.07	6.33				-	Flush		MW	
B-116		5/11/2016	9.46	10.72	5.19	6.45	4.27	-0.69	5.07	6.33		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-116		5/4/2016	5.38	6.64				-0.31	5.07	6.33				-	Flush		MW	
B-116		5/15/2015	6.17	7.43				-1.1	5.07	6.33				-	Flush		MW	
B-116		12/4/2014	5.94	7.2				-0.87	5.07	6.33				-	Flush		MW	
B-116		5/14/2014	5.72	6.98				-0.65	5.07	6.33				-	Flush		MW	
B-116		10/16/2013	6.17	7.43				-1.1	5.07	6.33				-	Flush		MW	
B-116		3/28/2013	6.46	7.72				-1.39	5.07	6.33				-	Flush		MW	
B-116		5/9/2012	5.78	7.04				-0.71	5.07	6.33				-	Flush		MW	
B-116		5/18/2011	6.24	7.5				-1.17	5.07	6.33				-	Flush		MW	
B-116		7/29/2010						NA	5.07	6.33				-	Flush		MW	
B-116		6/22/2009	5.9	7.16				-0.83	5.07	6.33				-	Flush		MW	
B-116		11/25/2008	6.85	8.11				-1.78	5.07	6.33				-	Flush		MW	
B-116		6/6/2008	6.13	7.39				-1.06	5.07	6.33				-	Flush		MW	
B-116		11/15/2007	6.35	7.61				-1.28	5.07	6.33				-	Flush		MW	
B-116		6/4/2007	6.29	7.55				-1.22	5.07	6.33				-	Flush		MW	
B-116		11/7/2006						NA	5.07	6.33				-	Flush		MW	
B-116		5/24/2006	5.82	7.08				-0.75	5.07	6.33				-	Flush		MW	
B-116		5/19/2005	6.59	7.85				-1.52	5.07	6.33				-	Flush		MW	
B-116		10/8/2004	2.45	3.71				2.62	5.07	6.33				-	Flush		MW	
B-116		11/24/2003	6.02	7.28				-0.95	5.07	6.33				-	Flush		MW	
B-116		10/31/2002	6.26	7.52				-1.19	5.07	6.33				-	Flush		MW	
B-116		11/8/2001	6.67	7.93				-1.6	5.07	6.33				-	Flush		MW	
B-116		11/9/2000	6.38	7.64				-1.31	5.07	6.33				-	Flush		MW	
B-116		11/18/1999	6.43	7.69				-1.36	5.07	6.33				-	Flush		MW	
B-116		11/12/1998	6.61	7.87				-1.54	5.07	6.33				-	Flush		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-116		11/13/1997	6.3	7.56				-1.23	5.07	6.33				-	Flush		MW	
B-116		11/18/1996	5.42	6.68				-0.35	5.07	6.33				-	Flush		MW	
B-116		12/18/1995	5.79	7.05				-0.72	5.07	6.33				-	Flush		MW	
B-117		5/11/2017	7.5	10.42				-1.53	5.97	8.89				-	Flush		MW	
B-117		8/19/2016						-2.25	5.97	8.89				-	Flush		MW	
B-117		5/11/2016	7.54	10.46				-1.57	5.97	8.89				-	Flush		MW	
B-117		5/4/2016	8.08	11				-2.11	5.97	8.89				-	Flush		MW	
B-117		5/15/2015	8.02	10.94				-2.05	5.97	8.89				-	Flush		MW	
B-117		12/4/2014	8.28	11.2				-2.31	5.97	8.89				-	Flush		MW	
B-117		5/14/2014	7.69	10.61				-1.72	5.97	8.89				-	Flush		MW	
B-117		10/16/2013	8.38	11.3				-2.41	5.97	8.89				-	Flush		MW	
B-117		3/28/2013	7.82	10.74	7.82	10.74	<0.01	-1.84	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		5/9/2012	7.52	10.44	7.51	10.43	0.01	-1.54	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		5/18/2011	7.2	10.12	7.2	10.12	<0.01	-1.22	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		7/29/2010			6.7		0.13	NA	5.97	8.89				-	Flush		MW	
B-117		6/22/2009	5.18	8.1				0.79	5.97	8.89				-	Flush		MW	
B-117		11/25/2008	7.17	10.09				-1.2	5.97	8.89				-	Flush		MW	
B-117		6/6/2008	4.55	7.47				1.42	5.97	8.89				-	Flush		MW	
B-117		11/15/2007	7.6	10.52				-1.63	5.97	8.89				-	Flush		MW	
B-117		6/4/2007	7.51	10.43				-1.54	5.97	8.89				-	Flush		MW	
B-117		11/7/2006						NA	5.97	8.89				-	Flush		MW	
B-117		5/24/2006	7.13	10.05				-1.16	5.97	8.89				-	Flush		MW	
B-117		5/19/2005	7.93	10.85				-1.96	5.97	8.89				-	Flush		MW	
B-117		10/8/2004	7.46	10.38				-1.49	5.97	8.89				-	Flush		MW	
B-117		11/24/2003	7.98	10.9				-2.01	5.97	8.89				-	Flush		MW	
B-117		10/31/2002	7.93	10.85	7.91	10.83	0.02	-1.94	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		11/8/2001	7.6	10.52	7.46	10.38	0.14	-1.51	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		1/30/2001	5.89	8.81	5.36	8.28	0.53	0.54	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		11/9/2000	7.83	10.75	6.34	9.26	1.49	-0.57	5.97	8.89		B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Flush		MW	
B-117		11/18/1999	7.34	10.26				-1.37	5.97	8.89				-	Flush		MW	
B-117		11/12/1998	7.22	10.14				-1.25	5.97	8.89				-	Flush		MW	
B-117		11/13/1997	7.15	10.07				-1.18	5.97	8.89				-	Flush		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-117		11/18/1996	7.18	10.1				-1.21	5.97	8.89				-	Flush		MW	
B-117		12/18/1995	7.18	10.1				-1.21	5.97	8.89				-	Flush		MW	
B-123		5/11/2017	4.79	1.64				5.97	10.76	7.61				-	Stick Up		MW	
B-123		12/1/2016	4.64	1.49				6.12	10.76	7.61				-	Stick Up		MW	
B-123		5/11/2016	4.51	1.36				6.25	10.76	7.61				-	Stick Up		MW	
B-123		11/19/2015	5.47	2.32				5.29	10.76	7.61				-	Stick Up		MW	
B-123		5/15/2015	5.7	2.55				5.06	10.76	7.61				-	Stick Up		MW	
B-123		12/4/2014	4.51	1.36				6.25	10.76	7.61				-	Stick Up		MW	
B-123		5/14/2014	4.75	1.6				6.01	10.76	7.61				-	Stick Up		MW	
B-123		10/16/2013	4.84	1.69				5.92	10.76	7.61				-	Stick Up		MW	
B-123		7/12/2013	4.75	1.6				6.01	10.76	7.61				-	Stick Up		MW	
B-123		3/28/2013	4.51	1.36				6.25	10.76	7.61				-	Stick Up		MW	
B-123		5/9/2012	5.04	1.89				5.72	10.76	7.61				-	Stick Up		MW	
B-123		5/18/2011	4.55	1.4				6.21	10.76	7.61				-	Stick Up		MW	
B-123		9/28/2010	5.66	2.51				5.1	10.76	7.61				-	Stick Up		MW	
B-123		7/29/2010						NA	10.76	7.61				-	Stick Up		MW	
B-123		6/22/2009	4.18	1.03				6.58	10.76	7.61				-	Stick Up		MW	
B-123		3/23/2009	6.13	2.98				4.63	10.76	7.61				-	Stick Up		MW	
B-123		11/25/2008	5.6	2.45				5.16	10.76	7.61				-	Stick Up		MW	
B-123		8/18/2008	4.77	1.62				5.99	10.76	7.61				-	Stick Up		MW	
B-123		6/6/2008	3.4	0.25				7.36	10.76	7.61				-	Stick Up		MW	
B-123		3/31/2008	4.64	1.49				6.12	10.76	7.61				-	Stick Up		MW	
B-123		11/15/2007	5.22	2.07				5.54	10.76	7.61				-	Stick Up		MW	
B-123		9/18/2007	6.09	2.94				4.67	10.76	7.61				-	Stick Up		MW	
B-123		6/4/2007	5.16	2.01				5.6	10.76	7.61				-	Stick Up		MW	
B-123		3/2/2007	5.07	1.92				5.69	10.76	7.61				-	Stick Up		MW	
B-123		11/7/2006						NA	10.76	7.61				-	Stick Up		MW	
B-123		8/29/2006	4.61	1.46				6.15	10.76	7.61				-	Stick Up		MW	
B-123		5/24/2006	5.24	2.09				5.52	10.76	7.61				-	Stick Up		MW	
B-123		2/8/2006						7.19	10.76	7.61				-	Stick Up		MW	
B-123		7/1/2005						6.24	10.76	7.61				-	Stick Up		MW	
B-123		5/19/2005	5.52	2.37				5.24	10.76	7.61				-	Stick Up		MW	
B-123		3/9/2005	4.55	1.4				6.21	10.76	7.61				-	Stick Up		MW	
B-123		10/8/2004	4.65	1.5				6.11	10.76	7.61				-	Stick Up		MW	
B-123		9/17/2004	5.7	2.55				5.06	10.76	7.61				-	Stick Up		MW	
B-123		6/25/2004	5.21	2.06				5.55	10.76	7.61				-	Stick Up		MW	
B-123		3/3/2004	5.89	2.74				4.87	10.76	7.61				-	Stick Up		MW	
B-123		11/24/2003	5.07	1.92				5.69	10.76	7.61				-	Stick Up		MW	
B-123		11/18/2003	4.98	1.83				5.78	10.76	7.61				-	Stick Up		MW	
B-123		8/27/2003	5.86	2.71				4.9	10.76	7.61				-	Stick Up		MW	
B-123		7/7/2003	5.15	2				5.61	10.76	7.61				-	Stick Up		MW	
B-123		3/12/2003	4.32	1.17				6.44	10.76	7.61				-	Stick Up		MW	
B-123		10/31/2002	4.41	1.26				6.35	10.76	7.61				-	Stick Up		MW	
B-123		8/12/2002	6.35	3.2				4.41	10.76	7.61				-	Stick Up		MW	
B-123		6/14/2002	5.11	1.96				5.65	10.76	7.61				-	Stick Up		MW	
B-123		2/19/2002	6.45	3.3				4.31	10.76	7.61				-	Stick Up		MW	
B-123		10/11/2001	6.13	2.98				4.63	10.76	7.61				-	Stick Up		MW	
B-123		9/19/2001	6.32	3.17				4.44	10.76	7.61				-	Stick Up		MW	
B-123		9/7/2001	6.19	3.04				4.57	10.76	7.61				-	Stick Up		MW	
B-123		9/5/2001	6.16	3.01				4.6	10.76	7.61				-	Stick Up		MW	
B-123		6/13/2001	4.69	1.54				6.07	10.76	7.61				-	Stick Up		MW	
B-123		2/19/2001	4.53	1.38				6.23	10.76	7.61				-	Stick Up		MW	
B-123		11/14/2000	5.72	2.57				5.04	10.76	7.61				-	Stick Up		MW	
B-123		11/9/2000	5.93	2.78				4.83	10.76	7.61				-	Stick Up		MW	
B-123		9/6/2000	4.39	1.24				6.37	10.76	7.61				-	Stick Up		MW	
B-123		6/16/2000	4.91	1.76				5.85	10.76	7.61				-	Stick Up		MW	
B-123		3/9/2000	5.35	2.2				5.41	10.76	7.61				-	Stick Up		MW	
B-123		11/18/1999	5.53	2.38				5.23	10.76	7.61				-	Stick Up		MW	
B-123		9/24/1999	4.28	1.13				6.48	10.76	7.61				-	Stick Up		MW	
B-123		6/15/1999	5.35	2.2				5.41	10.76	7.61				-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-123		3/11/1999	5.02	1.87				5.74	10.76	7.61				-	Stick Up		MW	
B-123		12/16/1998	6.7	3.55				4.06	10.76	7.61				-	Stick Up		MW	
B-123		11/12/1998	6.56	3.41				4.2	10.76	7.61				-	Stick Up		MW	
B-123		9/11/1998	5.96	2.81				4.8	10.76	7.61				-	Stick Up		MW	
B-123		6/19/1998	4.65	1.5				6.11	10.76	7.61				-	Stick Up		MW	
B-123		3/27/1998	4.63	1.48				6.13	10.76	7.61				-	Stick Up		MW	
B-123		12/19/1997	5.84	2.69				4.92	10.76	7.61				-	Stick Up		MW	
B-123		11/13/1997	5.29	2.14				5.47	10.76	7.61				-	Stick Up		MW	
B-123		9/24/1997	5.46	2.31				5.3	10.76	7.61				-	Stick Up		MW	
B-123		7/17/1997	6.11	2.96				4.65	10.76	7.61				-	Stick Up		MW	
B-123		7/1/1997	5.81	2.66				4.95	10.76	7.61				-	Stick Up		MW	
B-123		6/20/1997	5.41	2.26				5.35	10.76	7.61				-	Stick Up		MW	
B-123		6/2/1997	4.9	1.75				5.86	10.76	7.61				-	Stick Up		MW	
B-123		5/22/1997	5.56	2.41				5.2	10.76	7.61				-	Stick Up		MW	
B-123		5/9/1997	4.72	1.57				6.04	10.76	7.61				-	Stick Up		MW	
B-123		4/22/1997	4.97	1.82				5.79	10.76	7.61				-	Stick Up		MW	
B-123		4/11/1997	5.05	1.9				5.71	10.76	7.61				-	Stick Up		MW	
B-123		11/18/1996	5.07	1.92				5.69	10.76	7.61				-	Stick Up		MW	
B-123		12/18/1995	4.69	1.54				6.07	10.76	7.61				-	Stick Up		MW	
B-124		5/11/2017	6.7	3.64	4.95	1.89	1.75	3.68995	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/6/2017	6.96	3.9	6.07	3.01	0.89	2.73215	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/1/2016	6.43	3.37	5.77	2.71	0.66	3.07552	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/30/2016						NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		8/12/2016	6.83	3.77	5.12	2.06	1.71	3.52749	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/11/2016	6.67	3.61	4.89	1.83	1.78	3.74	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/8/2016	6.74	3.68	4.61	1.55	2.13	3.96	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/19/2015	6.53	3.47	5.38	2.32	1.15	3.37	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/3/2015	6.77	3.71	4.88	1.82	1.89	3.73	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/15/2015	6.71	3.65	5.54	2.48	1.17	3.21	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/18/2015	6.74	3.68	6.08	3.02	0.66	2.77	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/4/2014	5.67	2.61	5.14	2.08	0.53	3.73	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/11/2014	5.51	2.45	5.5	2.44	0.01	3.47	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/14/2014	5.74	2.68	4.97	1.91	0.77	3.85	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		1/23/2014	6.01	2.95	5.75	2.69	0.26	3.17	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/16/2013	4.83	1.77				4.14	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		7/12/2013	4.76	1.7				4.21	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		3/28/2013	5.34	2.28	5.32	2.26	0.02	3.65	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/15/2013	5.69	2.63	5.32	2.26	0.37	3.58	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/10/2012	5.62	2.56	5.46	2.4	0.16	3.48	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/30/2012	5.91	2.85	5.54	2.48	0.37	3.36	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/9/2012	5.15	2.09	5.15	2.09	<0.01	3.83	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/30/2012	5.46	2.4	5.45	2.39	0.01	3.52	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/21/2011	5.52	2.46	5.23	2.17	0.29	3.69	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/1/2011	5.91	2.85	5.63	2.57	0.28	3.29	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/18/2011	5.27	2.21	5.16	2.1	0.11	3.79	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/23/2011	5.91	2.85	5.63	2.57	0.28	3.29	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/3/2010	6.11	3.05	5.69	2.63	0.42	3.2	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/25/2010	5.62	2.56	4.88	1.82	0.74	3.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/19/2010	5.62	2.56	4.88	1.82	0.74	3.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/13/2010	5.36	2.3	4.94	1.88	0.42	3.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/28/2010	6.32	3.26	6.18	3.12	0.14	2.76	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/29/2010			6.05		<0.01	NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		6/10/2010						NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		6/22/2009	6.4	3.34	4.38	1.32	2.02	4.21	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/23/2009	7.1	4.04	5.98	2.92	1.12	2.78	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		11/25/2008	5.81	2.75	5.1	2.04	0.71	3.74	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/6/2008	3.6	0.54				5.37	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		11/15/2007	6.11	3.05	5.23	2.17	0.88	3.57	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/18/2007	6.6	3.54				2.37	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		6/4/2007	5.23	2.17	4.95	1.89	0.28	3.97	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/2/2007	6.8	3.74	6.35	3.29	0.45	2.54	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/7/2006			4.9		1.1	NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		8/29/2006	5.31	2.25	5.29	2.23	0.02	3.68	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/24/2006	6.43	3.37	5.05	1.99	1.38	3.66	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/8/2006			4.75		2.28	5.24	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		7/1/2005						3.92	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/19/2005	6.4	3.34				2.57	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/20/2005	6.95	3.89	3.49	0.43	3.46	4.83	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/9/2005	7.06	4	4.69	1.63	2.37	3.83	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/12/2005	6.49	3.43	4.38	1.32	2.11	4.19	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/3/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		11/24/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		11/16/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		11/12/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		11/5/2004	6.2	3.14	6.15	3.09	0.05	2.81	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/22/2004	6.3	3.24	4.74	1.68	1.56	3.94	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/8/2004	6.1	3.04				2.87	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		9/24/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		9/17/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		9/10/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		9/2/2004	6.1	3.04				2.87	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		8/4/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		7/9/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		6/25/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		6/10/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/28/2004	5.9	2.84				3.07	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/12/2004	5	1.94				3.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/29/2004	5	1.94				3.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/15/2004	4.84	1.78	4.84	1.78	<0.01	4.14	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		4/2/2004	6	2.94	4.45	1.39	1.55	4.23	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/17/2004	6	2.94				2.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		3/3/2004	5.9	2.84				3.07	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		2/17/2004	5.65	2.59	4.97	1.91	0.68	3.87	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/3/2004	5.8	2.74				3.17	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		1/6/2004	5.7	2.64				3.27	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		12/22/2003	5.7	2.64				3.27	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		11/24/2003	5.27	2.21	5.27	2.21	<0.01	3.71	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/18/2003	6.88	3.82	4.9	1.84	1.98	3.7	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/5/2003	4.65	1.59	4.47	1.41	0.18	4.47	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/22/2003	5.18	2.12	5.06	2	0.12	3.89	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/7/2003	5.66	2.6	5.39	2.33	0.27	3.53	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/24/2003	4.89	1.83	4.89	1.83	<0.01	4.09	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/8/2003	5.31	2.25	5.25	2.19	0.06	3.71	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/27/2003	5.29	2.23	5.22	2.16	0.07	3.74	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/12/2003	5.08	2.02	5.05	1.99	0.03	3.91	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/18/2003	5.1	2.04	5.06	2	0.04	3.9	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/7/2003	5.03	1.97	4.83	1.77	0.2	4.1	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/30/2003	4.68	1.62	4.66	1.6	0.02	4.31	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/17/2003	5.02	1.96	4.48	1.42	0.54	4.39	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/2/2003	4.72	1.66				4.25	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/20/2003	5.33	2.27	5.12	2.06	0.21	3.81	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/8/2003	6.57	3.51	4.65	1.59	1.92	3.96	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/25/2003	4.95	1.89	4.95	1.89	<0.01	4.03	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		4/9/2003	6.71	3.65	6.08	3.02	0.63	2.77	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/26/2003	6.81	3.75	6.3	3.24	0.51	2.57	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/12/2003	6.49	3.43	5	1.94	1.49	3.69	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/27/2003	6.5	3.44	3.44	0.38	3.06	4.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/13/2003	6.55	3.49	5.81	2.75	0.74	3.02	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/28/2003	6.7	3.64	5.93	2.87	0.77	2.89	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/24/2003	6.61	3.55	5.85	2.79	0.76	2.98	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/30/2002	6.16	3.1	4.49	1.43	1.67	4.17	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/19/2002	6.9	3.84	5.82	2.76	1.08	2.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/4/2002	6.5	3.44	5.48	2.42	1.02	3.3	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/18/2002	6.02	2.96	3.95	0.89	2.07	4.63	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/31/2002	5.29	2.23	3.85	0.79	1.44	4.85	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/18/2002	5.85	2.79	4.4	1.34	1.45	4.3	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/4/2002	5.4	2.34	4.97	1.91	0.43	3.92	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/17/2002	5.72	2.66	5.35	2.29	0.37	3.55	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/4/2002	5.25	2.19	5.02	1.96	0.23	3.91	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/12/2002	5.82	2.76	5.55	2.49	0.27	3.37	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/22/2002	6.65	3.59	4.9	1.84	1.75	3.74	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/27/2002	5.7	2.64	4.93	1.87	0.77	3.89	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/14/2002	5	1.94				3.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		5/31/2002	5.13	2.07	5.12	2.06	0.01	3.85	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/1/2002	4.93	1.87	4.91	1.85	0.02	4.06	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/19/2002	4.96	1.9	4.93	1.87	0.03	4.03	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/2/2002	5.03	1.97	4.98	1.92	0.05	3.98	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/19/2002	5.43	2.37	5.38	2.32	0.05	3.58	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/5/2002	6.1	3.04	5.96	2.9	0.14	2.98	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/19/2002	5.98	2.92	5.98	2.92	<0.01	3	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/7/2002	4.3	1.24				4.67	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		1/21/2002	5.82	2.76	5.82	2.76	<0.01	3.16	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/9/2002	5.81	2.75	5.81	2.75	<0.01	3.17	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/28/2001	6.79	3.73	5.64	2.58	1.15	3.11	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/11/2001	6.76	3.7	5.87	2.81	0.89	2.93	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/9/2001	7	3.94	5.96	2.9	1.04	2.81	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/8/2001	6.9	3.84	5.79	2.73	1.11	2.97	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/31/2001	6.97	3.91	6.14	3.08	0.83	2.67	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/17/2001	7.03	3.97	5.78	2.72	1.25	2.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/2/2001	7.08	4.02	6.06	3	1.02	2.72	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/19/2001	7.19	4.13	6.9	3.84	0.29	2.02	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/5/2001	7.68	4.62	7.45	4.39	0.23	1.48	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/21/2001	6.91	3.85	6.91	3.85	<0.01	2.07	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/9/2001	7	3.94				1.97	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		7/26/2001	6.05	2.99	6.05	2.99	<0.01	2.93	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/10/2001	5.47	2.41	5.4	2.34	0.07	3.56	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/28/2001	5.83	2.77	5.83	2.77	<0.01	3.15	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/13/2001	5.46	2.4	5.15	2.09	0.31	3.76	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/29/2001	5.95	2.89	5.95	2.89	<0.01	3.03	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/17/2001						NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/3/2001						NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/16/2001	5.55	2.49	5.55	2.49	<0.01	3.43	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/6/2001	5.58	2.52	5.58	2.52	<0.01	3.4	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/20/2001	5.2	2.14	4.89	1.83	0.31	4.02	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/6/2001	5.43	2.37	5.4	2.34	0.03	3.56	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/19/2001	6.51	3.45	6.45	3.39	0.06	2.51	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/6/2001	6.59	3.53	6.59	3.53	<0.01	2.39	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/23/2001	6.39	3.33	6.3	3.24	0.09	2.65	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/9/2001	6.68	3.62	6.68	3.62	<0.01	2.3	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/12/2000	6.29	3.23	5.62	2.56	0.67	3.22	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/28/2000	6.65	3.59	5.44	2.38	1.21	3.3	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/14/2000	4.89	1.83	4.18	1.12	0.71	4.66	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/9/2000	5.78	2.72	5.78	2.72	<0.01	3.2	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/31/2000						NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		10/18/2000	5.51	2.45	5.51	2.45	<0.01	3.47	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/2/2000	8.35	5.29	8.35	5.29	<0.01	0.63	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		9/19/2000	5.9	2.84	5.46	2.4	0.44	3.43	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/6/2000	5.8	2.74	5.65	2.59	0.15	3.29	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/23/2000	6.2	3.14	5.93	2.87	0.27	2.99	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/9/2000	6.27	3.21	4.83	1.77	1.44	3.87	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/25/2000	6.29	3.23	6.13	3.07	0.16	2.81	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/11/2000	6.07	3.01	6.07	3.01	<0.01	2.91	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/27/2000	5.88	2.82	5.53	2.47	0.35	3.37	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/16/2000	5.96	2.9	5.88	2.82	0.08	3.07	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/1/2000	6	2.94	5.85	2.79	0.15	3.09	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/19/2000	6.7	3.64	6.18	3.12	0.52	2.69	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/4/2000						NA	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/20/2000	4.45	1.39	4.13	1.07	0.32	4.78	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/5/2000	5.51	2.45	5.04	1.98	0.47	3.84	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/22/2000	5.6	2.54	5.32	2.26	0.28	3.6	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/9/2000	5.26	2.2	5.26	2.2	<0.01	3.72	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/24/2000	5.75	2.69	5.1	2.04	0.65	3.75	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/11/2000	5.85	2.79	5.36	2.3	0.49	3.52	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/26/2000	6.47	3.41	6.03	2.97	0.44	2.86	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/14/2000	5.66	2.6	4.78	1.72	0.88	4.02	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/30/1999	6	2.94	5.69	2.63	0.31	3.22	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		12/16/1999	5.12	2.06	4.67	1.61	0.45	4.22	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/1/1999	6.6	3.54	5.06	2	1.54	3.62	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/18/1999	5.58	2.52	5.55	2.49	0.03	3.41	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/4/1999	5.43	2.37	5.2	2.14	0.23	3.73	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/19/1999	5.6	2.54	5.4	2.34	0.2	3.53	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/7/1999	4.99	1.93	4.81	1.75	0.18	4.13	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/24/1999	5.46	2.4	5.29	2.23	0.17	3.65	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/9/1999	5.45	2.39	4.89	1.83	0.56	3.97	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/27/1999	6.02	2.96	5.39	2.33	0.63	3.46	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/12/1999	6.54	3.48	6.5	3.44	0.04	2.46	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/30/1999	6.78	3.72	6.2	3.14	0.58	2.66	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/16/1999	5.67	2.61	5.65	2.59	0.02	3.32	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/30/1999	5.67	2.61	5.64	2.58	0.03	3.32	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/15/1999	5.42	2.36	5.42	2.36	<0.01	3.56	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/2/1999	5.45	2.39	5.17	2.11	0.28	3.75	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/19/1999	5.08	2.02				3.89	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/4/1999	6.6	3.54				2.37	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/20/1999	5.07	2.01				3.9	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		4/12/1999	5.65	2.59	5.12	2.06	0.53	3.75	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/29/1999	5.23	2.17	4.66	1.6	0.57	4.2	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/11/1999	6.08	3.02	5.83	2.77	0.25	3.09	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/2/1999	6.2	3.14	6.08	3.02	0.12	2.87	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		2/10/1999	6.38	3.32	4.85	1.79	1.53	3.83	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/29/1999	6.81	3.75	5.35	2.29	1.46	3.34	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/15/1999	5.63	2.57	5.57	2.51	0.06	3.39	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/29/1998	6.45	3.39	6.45	3.39	<0.01	2.53	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/16/1998	6.48	3.42	6.47	3.41	0.01	2.5	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/1/1998	6.85	3.79	6.85	3.79	<0.01	2.13	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/20/1998	6.93	3.87	6.93	3.87	<0.01	2.05	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/12/1998	6.53	3.47	6.4	3.34	0.13	2.55	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/4/1998	6.59	3.53	6.59	3.53	<0.01	2.39	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/23/1998	6.51	3.45	6.51	3.45	<0.01	2.47	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/9/1998	6.85	3.79	6.85	3.79	<0.01	2.13	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/25/1998	5.83	2.77	5.75	2.69	0.08	3.2	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/11/1998	5.7	2.64	5.52	2.46	0.18	3.42	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/28/1998	5.37	2.31	5.35	2.29	0.02	3.62	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/14/1998	5.43	2.37	5.43	2.37	<0.01	3.55	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/31/1998	5.63	2.57	5.63	2.57	<0.01	3.35	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/16/1998	5.59	2.53				3.38	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		7/2/1998	5.44	2.38	5.44	2.38	<0.01	3.54	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/19/1998	5.03	1.97	5.03	1.97	<0.01	3.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/5/1998	4.91	1.85	4.73	1.67	0.18	4.21	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		5/20/1998	4.52	1.46	4.38	1.32	0.14	4.56	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/23/1998	4.39	1.33	4.38	1.32	0.01	4.59	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/10/1998	4.61	1.55	4.61	1.55	<0.01	4.37	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/27/1998	4.47	1.41				4.5	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		3/12/1998	5.14	2.08				3.83	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		2/27/1998	5.2	2.14	5.2	2.14	<0.01	3.78	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/10/1998	5.27	2.21	5.27	2.21	<0.01	3.71	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/30/1998	5.17	2.11	5.01	1.95	0.16	3.93	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/16/1998	5.83	2.77	5.6	2.54	0.23	3.33	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/19/1997	5.71	2.65	5.7	2.64	0.01	3.27	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		12/4/1997	5.53	2.47	5.23	2.17	0.3	3.68	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/21/1997	6.22	3.16	6.16	3.1	0.06	2.8	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/13/1997	6.4	3.34	6.36	3.3	0.04	2.6	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/7/1997	6.44	3.38	6.13	3.07	0.31	2.78	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/24/1997	7.1	4.04	7.08	4.02	0.02	1.89	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/10/1997	6.81	3.75	6.78	3.72	0.03	2.18	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/24/1997	6.06	3	6.06	3	<0.01	2.92	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/12/1997	5.98	2.92	5.25	2.19	0.73	3.58	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/28/1997	6.2	3.14	6.05	2.99	0.15	2.89	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/14/1997	6.74	3.68	6.74	3.68	<0.01	2.24	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/1/1997	6.4	3.34	6.14	3.08	0.26	2.78	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		7/17/1997	7	3.94	6.85	3.79	0.15	2.09	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/1/1997	6.6	3.54	5.82	2.76	0.78	3	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/20/1997	6.4	3.34				2.57	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		6/2/1997	6.19	3.13	5.53	2.47	0.66	3.32	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/22/1997	6.05	2.99				2.92	8.97	5.91	15			-	Stick Up	Yes	RW - Inactive	
B-124		5/9/1997	5.53	2.47	5.31	2.25	0.22	3.62	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/22/1997	4.71	1.65	4.41	1.35	0.3	4.5	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/11/1997	6.24	3.18	4.33	1.27	1.91	4.28	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		11/18/1996	6.01	2.95	5.93	2.87	0.08	3.02	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		10/21/1996	6.23	3.17	5.08	2.02	1.15	3.67	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		9/26/1996	5.85	2.79	4.83	1.77	1.02	3.95	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		8/29/1996	6.18	3.12	4.14	1.08	2.04	4.45	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		7/18/1996	6.38	3.32	4.35	1.29	2.03	4.24	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		6/6/1996	6.52	3.46	4.48	1.42	2.04	4.11	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		5/23/1996	6.24	3.18	4.35	1.29	1.89	4.26	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		4/29/1996	6.4	3.34	5.51	2.45	0.89	3.29	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		3/22/1996	4.52	1.46	4.47	1.41	0.05	4.49	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/27/1996	5.02	1.96	4.68	1.62	0.34	4.23	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		2/26/1996	6.65	3.59	4.15	1.09	2.5	4.35	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/23/1996	3.69	0.63	3.56	0.5	0.13	5.39	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-124		1/22/1996	5.46	2.4	3.37	0.31	2.09	5.21	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-124		12/18/1995	6.64	3.58	4.14	1.08	2.5	4.36	8.97	5.91	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-125		5/11/2017	4.87	1.61				3.64	8.51	5.25				-	Stick Up		MW	
B-125		12/1/2016	5.24	1.98				3.27	8.51	5.25				-	Stick Up		MW	
B-125		8/19/2016						3.69	8.51	5.25				-	Stick Up		MW	
B-125		5/11/2016	4.72	1.46				3.79	8.51	5.25				-	Stick Up		MW	
B-125		5/9/2016	4.65	1.39				3.86	8.51	5.25				-	Stick Up		MW	
B-125		11/19/2015	5.32	2.06				3.19	8.51	5.25				-	Stick Up		MW	
B-125		5/15/2015	5.29	2.03				3.22	8.51	5.25				-	Stick Up		MW	
B-125		2/13/2015	5.33	2.07				3.18	8.51	5.25				-	Stick Up		MW	
B-125		12/4/2014	5.04	1.78				3.47	8.51	5.25				-	Stick Up		MW	
B-125		5/14/2014	4.77	1.51				3.74	8.51	5.25				-	Stick Up		MW	
B-125		10/16/2013	5.06	1.8				3.45	8.51	5.25				-	Stick Up		MW	
B-125		7/12/2013	4.58	1.32				3.93	8.51	5.25				-	Stick Up		MW	
B-125		3/28/2013	4.77	1.51				3.74	8.51	5.25				-	Stick Up		MW	
B-125		5/9/2012	4.6	1.34				3.91	8.51	5.25				-	Stick Up		MW	
B-125		5/18/2011	4.75	1.49				3.76	8.51	5.25				-	Stick Up		MW	
B-125		7/29/2010						NA	8.51	5.25				-	Stick Up		MW	
B-125		6/22/2009	4.28	1.02				4.23	8.51	5.25				-	Stick Up		MW	
B-125		3/23/2009	5.65	2.39				2.86	8.51	5.25				-	Stick Up		MW	
B-125		11/25/2008	5.27	2.01				3.24	8.51	5.25				-	Stick Up		MW	
B-125		8/18/2008	4.71	1.45				3.8	8.51	5.25				-	Stick Up		MW	
B-125		6/6/2008	4.89	1.63				3.62	8.51	5.25				-	Stick Up		MW	
B-125		3/31/2008	4.73	1.47				3.78	8.51	5.25				-	Stick Up		MW	
B-125		11/15/2007	5.12	1.86				3.39	8.51	5.25				-	Stick Up		MW	
B-125		9/18/2007	5.88	2.62				2.63	8.51	5.25				-	Stick Up		MW	
B-125		6/4/2007	4.7	1.44				3.81	8.51	5.25				-	Stick Up		MW	
B-125		3/2/2007	5.08	1.82				3.43	8.51	5.25				-	Stick Up		MW	
B-125		11/7/2006						NA	8.51	5.25				-	Stick Up		MW	
B-125		8/29/2006	4.6	1.34				3.91	8.51	5.25				-	Stick Up		MW	
B-125		5/24/2006	4.94	1.68				3.57	8.51	5.25				-	Stick Up		MW	
B-125		2/8/2006						5.24	8.51	5.25				-	Stick Up		MW	
B-125		7/1/2005						4.7	8.51	5.25				-	Stick Up		MW	
B-125		5/19/2005	5.07	1.81				3.44	8.51	5.25				-	Stick Up		MW	
B-125		3/9/2005	4.66	1.4				3.85	8.51	5.25				-	Stick Up		MW	
B-125		10/8/2004	4.65	1.39				3.86	8.51	5.25				-	Stick Up		MW	
B-125		9/17/2004	5.15	1.89				3.36	8.51	5.25				-	Stick Up		MW	
B-125		6/25/2004	4.7	1.44				3.81	8.51	5.25				-	Stick Up		MW	
B-125		3/3/2004	5.1	1.84				3.41	8.51	5.25				-	Stick Up		MW	
B-125		11/24/2003	4.95	1.69				3.56	8.51	5.25				-	Stick Up		MW	
B-125		11/18/2003	4.93	1.67				3.58	8.51	5.25				-	Stick Up		MW	
B-125		8/27/2003	4.9	1.64				3.61	8.51	5.25				-	Stick Up		MW	
B-125		7/7/2003	4.5	1.24				4.01	8.51	5.25				-	Stick Up		MW	
B-125		3/12/2003	4.43	1.17				4.08	8.51	5.25				-	Stick Up		MW	
B-125		10/31/2002	4.5	1.24				4.01	8.51	5.25				-	Stick Up		MW	
B-125		8/12/2002	5.18	1.92				3.33	8.51	5.25				-	Stick Up		MW	
B-125		6/14/2002	4.45	1.19				4.06	8.51	5.25				-	Stick Up		MW	
B-125		9/19/2001	6.09	2.83				2.42	8.51	5.25				-	Stick Up		MW	
B-125		6/13/2001	4.46	1.2				4.05	8.51	5.25				-	Stick Up		MW	
B-125		2/19/2001	4.87	1.61				3.64	8.51	5.25				-	Stick Up		MW	
B-125		11/14/2000	5.24	1.98				3.27	8.51	5.25				-	Stick Up		MW	
B-125		11/9/2000	5.42	2.16				3.09	8.51	5.25				-	Stick Up		MW	
B-125		9/6/2000	4.59	1.33				3.92	8.51	5.25				-	Stick Up		MW	
B-125		6/16/2000	4.62	1.36				3.89	8.51	5.25				-	Stick Up		MW	
B-125		3/9/2000	4.59	1.33				3.92	8.51	5.25				-	Stick Up		MW	
B-125		12/6/1999	4.67	1.41				3.84	8.51	5.25				-	Stick Up		MW	
B-125		11/18/1999	5.42	2.16				3.09	8.51	5.25				-	Stick Up		MW	
B-125		9/24/1999	4	0.74				4.51	8.51	5.25				-	Stick Up		MW	
B-125		6/15/1999	4.62	1.36				3.89	8.51	5.25				-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-125		3/11/1999	4.69	1.43				3.82	8.51	5.25				-	Stick Up		MW	
B-125		12/16/1998	5.84	2.58				2.67	8.51	5.25				-	Stick Up		MW	
B-125		11/12/1998	6.05	2.79				2.46	8.51	5.25				-	Stick Up		MW	
B-125		9/11/1998	5.15	1.89				3.36	8.51	5.25				-	Stick Up		MW	
B-125		6/19/1998	4.21	0.95				4.3	8.51	5.25				-	Stick Up		MW	
B-125		3/27/1998	4.27	1.01				4.24	8.51	5.25				-	Stick Up		MW	
B-125		12/19/1997	5.03	1.77				3.48	8.51	5.25				-	Stick Up		MW	
B-125		11/13/1997	5.16	1.9				3.35	8.51	5.25				-	Stick Up		MW	
B-125		9/24/1997	5.07	1.81				3.44	8.51	5.25				-	Stick Up		MW	
B-125		7/17/1997	5.39	2.13				3.12	8.51	5.25				-	Stick Up		MW	
B-125		7/1/1997	5.09	1.83				3.42	8.51	5.25				-	Stick Up		MW	
B-125		6/20/1997	4.96	1.7				3.55	8.51	5.25				-	Stick Up		MW	
B-125		6/2/1997	4.44	1.18				4.07	8.51	5.25				-	Stick Up		MW	
B-125		5/22/1997	4.91	1.65				3.6	8.51	5.25				-	Stick Up		MW	
B-125		5/9/1997	4.27	1.01				4.24	8.51	5.25				-	Stick Up		MW	
B-125		4/22/1997	4.26	1				4.25	8.51	5.25				-	Stick Up		MW	
B-125		4/11/1997	4.59	1.33				3.92	8.51	5.25				-	Stick Up		MW	
B-125		11/18/1996	4.69	1.43				3.82	8.51	5.25				-	Stick Up		MW	
B-125		12/18/1995	4.35	1.09				4.16	8.51	5.25				-	Stick Up		MW	
B-126		5/11/2017	5.1	2.11				3.41	8.51	5.52				-	Stick Up		MW	
B-126		12/1/2016	5.41	2.42				3.1	8.51	5.52				-	Stick Up		MW	
B-126		8/19/2016						3.31	8.51	5.52				-	Stick Up		MW	
B-126		5/11/2016	4.91	1.92				3.6	8.51	5.52				-	Stick Up		MW	
B-126		5/10/2016	5.04	2.05				3.47	8.51	5.52				-	Stick Up		MW	
B-126		11/19/2015	5.23	2.24				3.28	8.51	5.52				-	Stick Up		MW	
B-126		5/15/2015	5.51	2.52				3	8.51	5.52				-	Stick Up		MW	
B-126		2/13/2015	5.38	2.39				3.13	8.51	5.52				-	Stick Up		MW	
B-126		12/4/2014	5.34	2.35				3.17	8.51	5.52				-	Stick Up		MW	
B-126		5/14/2014	5.01	2.02				3.5	8.51	5.52				-	Stick Up		MW	
B-126		10/16/2013	5.18	2.19				3.33	8.51	5.52				-	Stick Up		MW	
B-126		7/12/2013	4.91	1.92				3.6	8.51	5.52				-	Stick Up		MW	
B-126		3/28/2013	4.98	1.99				3.53	8.51	5.52				-	Stick Up		MW	
B-126		5/9/2012	4.83	1.84				3.68	8.51	5.52				-	Stick Up		MW	
B-126		5/18/2011	5.13	2.14				3.38	8.51	5.52				-	Stick Up		MW	
B-126		7/30/2010						NA	8.51	5.52				-	Stick Up		MW	
B-126		6/22/2009	4.61	1.62				3.9	8.51	5.52				-	Stick Up		MW	
B-126		3/23/2009	5.67	2.68				2.84	8.51	5.52				-	Stick Up		MW	
B-126		11/25/2008	5.53	2.54				2.98	8.51	5.52				-	Stick Up		MW	
B-126		8/18/2008	4.98	1.99				3.53	8.51	5.52				-	Stick Up		MW	
B-126		6/6/2008	5.14	2.15				3.37	8.51	5.52				-	Stick Up		MW	
B-126		3/31/2008	5.02	2.03				3.49	8.51	5.52				-	Stick Up		MW	
B-126		11/15/2007	5.05	2.06				3.46	8.51	5.52				-	Stick Up		MW	
B-126		9/18/2007	5.77	2.78				2.74	8.51	5.52				-	Stick Up		MW	
B-126		6/4/2007	5.08	2.09				3.43	8.51	5.52				-	Stick Up		MW	
B-126		3/2/2007	5.12	2.13				3.39	8.51	5.52				-	Stick Up		MW	
B-126		11/7/2006						NA	8.51	5.52				-	Stick Up		MW	
B-126		8/29/2006	4.83	1.84				3.68	8.51	5.52				-	Stick Up		MW	
B-126		5/24/2006	5.12	2.13				3.39	8.51	5.52				-	Stick Up		MW	
B-126		2/8/2006						5.08	8.51	5.52				-	Stick Up		MW	
B-126		7/1/2005						4.8	8.51	5.52				-	Stick Up		MW	
B-126		5/19/2005	5.1	2.11				3.41	8.51	5.52				-	Stick Up		MW	
B-126		3/9/2005	4.87	1.88				3.64	8.51	5.52				-	Stick Up		MW	
B-126		10/8/2004	4.84	1.85				3.67	8.51	5.52				-	Stick Up		MW	
B-126		9/17/2004	5.14	2.15				3.37	8.51	5.52				-	Stick Up		MW	
B-126		6/25/2004	4.77	1.78				3.74	8.51	5.52				-	Stick Up		MW	
B-126		3/3/2004	5.18	2.19				3.33	8.51	5.52				-	Stick Up		MW	
B-126		11/24/2003	5.13	2.14				3.38	8.51	5.52				-	Stick Up		MW	
B-126		11/18/2003	5.11	2.12				3.4	8.51	5.52				-	Stick Up		MW	
B-126		8/27/2003	5.25	2.26				3.26	8.51	5.52				-	Stick Up		MW	
B-126		7/7/2003	4.87	1.88				3.64	8.51	5.52				-	Stick Up		MW	

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-126		3/12/2003	4.65	1.66				3.86	8.51	5.52				-	Stick Up		MW	
B-126		10/31/2002	4.77	1.78				3.74	8.51	5.52				-	Stick Up		MW	
B-126		8/12/2002	6.33	3.34				2.18	8.51	5.52				-	Stick Up		MW	
B-126		6/14/2002	4.77	1.78				3.74	8.51	5.52				-	Stick Up		MW	
B-126		2/19/2002	5.27	2.28				3.24	8.51	5.52				-	Stick Up		MW	
B-126		9/19/2001	5.81	2.82				2.7	8.51	5.52				-	Stick Up		MW	
B-126		6/13/2001	4.62	1.63				3.89	8.51	5.52				-	Stick Up		MW	
B-126		2/19/2001	4.69	1.7				3.82	8.51	5.52				-	Stick Up		MW	
B-126		11/14/2000	5.19	2.2				3.32	8.51	5.52				-	Stick Up		MW	
B-126		11/9/2000	5.39	2.4				3.12	8.51	5.52				-	Stick Up		MW	
B-126		9/6/2000	4.51	1.52				4	8.51	5.52				-	Stick Up		MW	
B-126		6/16/2000	4.74	1.75				3.77	8.51	5.52				-	Stick Up		MW	
B-126		3/9/2000	4.62	1.63				3.89	8.51	5.52				-	Stick Up		MW	
B-126		12/6/1999	4.85	1.86				3.66	8.51	5.52				-	Stick Up		MW	
B-126		11/18/1999	5.54	2.55				2.97	8.51	5.52				-	Stick Up		MW	
B-126		9/24/1999	4.37	1.38				4.14	8.51	5.52				-	Stick Up		MW	
B-126		6/15/1999	4.81	1.82				3.7	8.51	5.52				-	Stick Up		MW	
B-126		3/11/1999	4.62	1.63				3.89	8.51	5.52				-	Stick Up		MW	
B-126		12/16/1998	5.66	2.67				2.85	8.51	5.52				-	Stick Up		MW	
B-126		11/12/1998	5.83	2.84				2.68	8.51	5.52				-	Stick Up		MW	
B-126		9/11/1998	5.24	2.25				3.27	8.51	5.52				-	Stick Up		MW	
B-126		6/19/1998	4.35	1.36				4.16	8.51	5.52				-	Stick Up		MW	
B-126		3/27/1998	4.32	1.33				4.19	8.51	5.52				-	Stick Up		MW	
B-126		12/19/1997	4.89	1.9				3.62	8.51	5.52				-	Stick Up		MW	
B-126		11/13/1997	4.85	1.86				3.66	8.51	5.52				-	Stick Up		MW	
B-126		9/24/1997	5.12	2.13				3.39	8.51	5.52				-	Stick Up		MW	
B-126		7/17/1997	5.27	2.28				3.24	8.51	5.52				-	Stick Up		MW	
B-126		7/1/1997	5.05	2.06				3.46	8.51	5.52				-	Stick Up		MW	
B-126		6/20/1997	4.82	1.83				3.69	8.51	5.52				-	Stick Up		MW	
B-126		6/2/1997	4.52	1.53				3.99	8.51	5.52				-	Stick Up		MW	
B-126		5/22/1997	4.88	1.89				3.63	8.51	5.52				-	Stick Up		MW	
B-126		5/9/1997	4.21	1.22				4.3	8.51	5.52				-	Stick Up		MW	
B-126		4/22/1997	4.37	1.38				4.14	8.51	5.52				-	Stick Up		MW	
B-126		4/11/1997	4.72	1.73				3.79	8.51	5.52				-	Stick Up		MW	
B-126		11/18/1996	4.59	1.6				3.92	8.51	5.52				-	Stick Up		MW	
B-126		12/18/1995	4.46	1.47				4.05	8.51	5.52				-	Stick Up		MW	
B-129		5/11/2017	10.23	8.54	5.15	3.46	5.08	2.18623	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/11/2016	5.88	4.19				2.14	8.02	6.33	15			-	Stick Up		MW	
B-129		5/15/2015	10.56	8.87	5.99	4.3	4.57	1.41	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		12/4/2014	10.19	8.5	4.79	3.1	5.4	2.5	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/14/2014	10.28	8.59	5.39	3.7	4.89	1.97	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-129		10/16/2013	10.57	8.88	5.19	3.5	5.38	2.11	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		3/28/2013	10.39	8.7	5.81	4.12	4.58	1.59	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/9/2012	10.24	8.55	5.36	3.67	4.88	2	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/18/2011	10.55	8.86	6.1	4.41	4.45	1.32	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		7/29/2010			5.88		5.02	NA	8.02	6.33	15			-	Stick Up		MW	
B-129		6/22/2009	10.42	8.73	5.59	3.9	4.83	1.78	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		3/23/2009	10.56	8.87	6.49	4.8	4.07	0.98	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/25/2008	10.52	8.83	6.02	4.33	4.5	1.39	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		6/6/2008	10.12	8.43	5.81	4.12	4.31	1.63	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/15/2007	10.21	8.52	6.07	4.38	4.14	1.39	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		6/4/2007	9.59	7.9	6.17	4.48	3.42	1.39	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/7/2006			6.04		3.46	NA	8.02	6.33	15			-	Stick Up		MW	
B-129		5/24/2006	8.91	7.22	5.18	3.49	3.73	2.34	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-129		5/19/2005	8.99	7.3	6.98	5.29	2.01	0.77	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		10/8/2004	8.44	6.75	6.64	4.95	1.8	1.14	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/24/2003	7.41	5.72	5.95	4.26	1.46	1.87	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		4/28/2003	7.27	5.58	6.83	5.14	0.44	1.13	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		4/25/2003	7.76	6.07	6.75	5.06	1.01	1.13	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/20/2002	6.68	4.99	6.09	4.4	0.59	1.85	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/1/2002	6.81	5.12	6.4	4.71	0.41	1.56	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		10/31/2002	7.86	6.17	6.34	4.65	1.52	1.48	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/9/2001	7.8	6.11	7.43	5.74	0.37	0.54	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/8/2001	8.45	6.76	7.21	5.52	1.24	0.64	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		1/30/2001	6.93	5.24	6.1	4.41	0.83	1.81	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-129		11/9/2000	8.2	6.51	7.1	5.41	1.1	0.77	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/17/2000	7.39	5.7	6.97	5.28	0.42	0.99	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/16/2000	7.78	6.09	6.9	5.21	0.88	1	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/19/1999	6.83	5.14	6.56	4.87	0.27	1.42	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/18/1999	7.45	5.76	6.61	4.92	0.84	1.3	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/21/1999	7.27	5.58	6.91	5.22	0.36	1.06	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/20/1999	7.6	5.91	6.9	5.21	0.7	1.03	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		12/16/1998	7.41	5.72	6.95	5.26	0.46	1.01	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/13/1998	7.63	5.94	7.33	5.64	0.3	0.65	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/12/1998	8.71	7.02	7.31	5.62	1.4	0.52	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		6/29/1998	7.43	5.74	6.56	4.87	0.87	1.34	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-129		5/21/1998	6.97	5.28	6.25	4.56	0.72	1.67	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/20/1998	7.75	6.06	6.11	4.42	1.64	1.69	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		12/17/1997	7	5.31	6.51	4.82	0.49	1.44	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/14/1997	6.7	5.01	6.14	4.45	0.56	1.8	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/13/1997	7.61	5.92	6.61	4.92	1	1.28	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		6/25/1997	7.47	5.78	6.79	5.1	0.68	1.14	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/23/1997	7.24	5.55	6.88	5.19	0.36	1.09	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/22/1997	8.39	6.7	6.6	4.91	1.79	1.18	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/19/1996	6.7	5.01	6.48	4.79	0.22	1.51	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		11/18/1996	7.03	5.34	6.45	4.76	0.58	1.49	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		10/22/1996	7.16	5.47	6.8	5.11	0.36	1.17	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-129		10/21/1996	7.65	5.96	6.74	5.05	0.91	1.16	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		9/26/1996	7.98	6.29	7.17	5.48	0.81	0.74	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		8/30/1996	7.03	5.34	6.6	4.91	0.43	1.36	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		8/29/1996	7.65	5.96	6.41	4.72	1.24	1.44	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		7/19/1996	6.27	4.58	6.01	4.32	0.26	1.98	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		7/18/1996	7.55	5.86	6.26	4.57	1.29	1.59	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		6/7/1996	7.15	5.46	6.83	5.14	0.32	1.15	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		6/6/1996	7.51	5.82	6.92	5.23	0.59	1.02	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/24/1996	7.18	5.49	6.74	5.05	0.44	1.22	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		5/23/1996	7.95	6.26	6.56	4.87	1.39	1.27	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		4/29/1996	7.54	5.85	6.61	4.92	0.93	1.28	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-129		3/22/1996	6.88	5.19	6.36	4.67	0.52	1.59	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		2/27/1996	7.04	5.35	6.6	4.91	0.44	1.36	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		2/26/1996	8.34	6.65	6.28	4.59	2.06	1.46	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		1/23/1996	7.44	5.75	6.13	4.44	1.31	1.71	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		1/22/1996	10.26	8.57	5.98	4.29	4.28	1.46	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-129		12/18/1995	10.02	8.33	5.83	4.14	4.19	1.63	8.02	6.33	15	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	
B-130		5/11/2017	5.39	3.81	5.09	3.51	0.3	4.57918	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		5/11/2016	5.4	3.82	5.2	3.62	0.2	4.48	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		5/15/2015	5.75	4.17	5.69	4.11	0.06	4	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		12/4/2014	5.63	4.05	5.44	3.86	0.19	4.24	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		5/14/2014	5.83	4.25	5.61	4.03	0.22	4.06	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		10/16/2013	5.45	3.87	5.22	3.64	0.23	4.45	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		3/28/2013	5.47	3.89	5.33	3.75	0.14	4.35	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		5/9/2012	5.24	3.66	5.13	3.55	0.11	4.55	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		6/2/2011	5.63	4.05	5.45	3.87	0.18	4.23	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		7/29/2010			4.85		0.05	NA	9.69	8.11	16			-	Stick Up		MW	

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-130		6/22/2009	4.77	3.19	4.7	3.12	0.07	4.99	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		3/23/2009	5.6	4.02	5.46	3.88	0.14	4.22	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/25/2008	5.76	4.18	5.61	4.03	0.15	4.07	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		6/6/2008	5.97	4.39	5.75	4.17	0.22	3.92	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/15/2007	4.93	3.35	4.88	3.3	0.05	4.81	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		6/4/2007	5.49	3.91	5.32	3.74	0.17	4.36	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/7/2006			5.3		0.02	NA	9.69	8.11	16			-	Stick Up		MW	
B-130		5/24/2006	5.28	3.7	4.62	3.04	0.66	5.02	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		5/19/2005	5.44	3.86	5.32	3.74	0.12	4.36	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		10/8/2004	5.27	3.69	4.69	3.11	0.58	4.96	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/24/2003	4.77	3.19	4.62	3.04	0.15	5.06	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		10/31/2002	4.47	2.89	4.36	2.78	0.11	5.32	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/8/2001	5.97	4.39				3.72	9.69	8.11	16			-	Stick Up		MW	
B-130		11/9/2000	5.32	3.74	5.27	3.69	0.05	4.42	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/18/1999	5.23	3.65	5.18	3.6	0.05	4.51	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/12/1998	5.7	4.12	5.6	4.02	0.1	4.08	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		9/17/1998	5.28	3.7	5.19	3.61	0.09	4.49	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/13/1997	5.56	3.98	5.48	3.9	0.08	4.2	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		11/18/1996	5.65	4.07	5.58	4	0.07	4.11	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-130		12/18/1995	5.5	3.92	5.41	3.83	0.09	4.27	9.69	8.11	16	B-130	0.9306	80% RESIDUAL OIL, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-131		5/11/2017	4.94	2.42				3.78	8.72	6.2	14			-	Stick Up		MW	
B-131		5/11/2016	4.51	1.99				4.21	8.72	6.2	14			-	Stick Up		MW	
B-131		5/5/2016	4.78	2.26				3.94	8.72	6.2	14			-	Stick Up		MW	
B-131		5/20/2015	6.27	3.75				2.45	8.72	6.2	17.49			-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-131		5/15/2015	6.31	3.79				2.41	8.72	6.2	14			-	Stick Up		MW	
B-131		12/4/2014	5.25	2.73				3.47	8.72	6.2	14			-	Stick Up		MW	
B-131		6/2/2014	5.31	2.79				3.41	8.72	6.2	17.49			-	Stick Up		MW	
B-131		5/14/2014	5.48	2.96				3.24	8.72	6.2	14			-	Stick Up		MW	
B-131		10/16/2013	4.93	2.41				3.79	8.72	6.2	14			-	Stick Up		MW	
B-131		3/28/2013	4.95	2.43				3.77	8.72	6.2	14			-	Stick Up		MW	
B-131		5/9/2012	5.29	2.77				3.43	8.72	6.2	14			-	Stick Up		MW	
B-131		5/18/2011	5.25	2.73				3.47	8.72	6.2	14			-	Stick Up		MW	
B-131		7/29/2010						NA	8.72	6.2	14			-	Stick Up		MW	
B-131		6/22/2009	4.45	1.93				4.27	8.72	6.2	14			-	Stick Up		MW	
B-131		3/23/2009	6.11	3.59				2.61	8.72	6.2	14			-	Stick Up		MW	
B-131		11/25/2008	5.49	2.97				3.23	8.72	6.2	14			-	Stick Up		MW	
B-131		6/6/2008	5.57	3.05				3.15	8.72	6.2	14			-	Stick Up		MW	
B-131		11/15/2007	5.64	3.12				3.08	8.72	6.2	14			-	Stick Up		MW	
B-131		6/4/2007	5.74	3.22				2.98	8.72	6.2	14			-	Stick Up		MW	
B-131		11/7/2006						NA	8.72	6.2	14			-	Stick Up		MW	
B-131		5/24/2006	5.6	3.08				3.12	8.72	6.2	14			-	Stick Up		MW	
B-131		5/19/2005	6.01	3.49				2.71	8.72	6.2	14			-	Stick Up		MW	
B-131		10/21/2004	5.15	2.63				3.57	8.72	6.2	14			-	Stick Up		MW	
B-131		10/8/2004	5.42	2.9				3.3	8.72	6.2	14			-	Stick Up		MW	
B-131		11/24/2003	4.64	2.12				4.08	8.72	6.2	14			-	Stick Up		MW	
B-131		11/13/2002	4.75	2.23				3.97	8.72	6.2	14			-	Stick Up		MW	
B-131		10/31/2002	4.83	2.31				3.89	8.72	6.2	14			-	Stick Up		MW	
B-131		11/13/2001	7.02	4.5				1.7	8.72	6.2	14			-	Stick Up		MW	
B-131		11/8/2001	6.97	4.45				1.75	8.72	6.2	14			-	Stick Up		MW	
B-131		11/17/2000	5.25	2.73				3.47	8.72	6.2	14			-	Stick Up		MW	
B-131		11/9/2000	5.55	3.03				3.17	8.72	6.2	14			-	Stick Up		MW	
B-131		12/3/1999	4.65	2.13				4.07	8.72	6.2	14			-	Stick Up		MW	
B-131		11/18/1999	5.26	2.74				3.46	8.72	6.2	14			-	Stick Up		MW	
B-131		11/13/1998	6.35	3.83				2.37	8.72	6.2	14			-	Stick Up		MW	
B-131		11/12/1998	6.32	3.8				2.4	8.72	6.2	14			-	Stick Up		MW	
B-131		11/20/1997	4.66	2.14				4.06	8.72	6.2	14			-	Stick Up		MW	
B-131		11/13/1997	1.98	-0.54				6.74	8.72	6.2	14			-	Stick Up		MW	
B-131		11/18/1996	4.31	1.79				4.41	8.72	6.2	14			-	Stick Up		MW	
B-131		12/18/1995	4.11	1.59				4.61	8.72	6.2	14			-	Stick Up		MW	
B-132		5/11/2017	4.66	0.06	4.65	0.05	0.01	2.21865	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/6/2017	5.19	0.59	5.12	0.52	0.07	1.74058	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		12/1/2016	4.46	-0.14	4.39	-0.21	0.07	2.47058	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		8/19/2016						2.12	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		8/12/2016	4.86	0.26	4.77	0.17	0.09	2.08789	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-132		5/11/2016	4.68	0.08	4.67	0.07	0.01	2.2	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		5/11/2016	4.74	0.14				2.13	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		11/19/2015	4.77	0.17	4.68	0.08	0.09	2.18	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		8/3/2015	4.66	0.06	4.57	-0.03	0.09	2.29	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		5/15/2015	4.98	0.38	4.93	0.33	0.05	1.93	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		2/18/2015	5.22	0.62	5.15	0.55	0.07	1.71	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		12/4/2014	5	0.4	4.96	0.36	0.04	1.9	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		8/11/2014	4.97	0.37	4.88	0.28	0.09	1.98	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		5/15/2014	4.97	0.37	4.91	0.31	0.06	1.95	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		1/23/2014	4.99	0.39	4.99	0.39	<0.01	1.89	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/16/2013	4.47	-0.13				2.4	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		7/12/2013	4.43	-0.17	4.42	-0.18	0.01	2.45	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/28/2013	4.63	0.03				2.24	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		2/15/2013	4.47	-0.13				2.4	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		10/10/2012	4.85	0.25	4.76	0.16	0.09	2.1	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-132		7/30/2012	4.77	0.17	4.72	0.12	0.05	2.14	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		5/9/2012	4.62	0.02	4.6	0	0.02	2.27	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		1/30/2012	5.08	0.48	5.02	0.42	0.06	1.84	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/21/2011	4.96	0.36	4.93	0.33	0.03	1.94	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		8/1/2011	4.95	0.35				1.92	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		5/18/2011	4.94	0.34	4.94	0.34	<0.01	1.94	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		2/23/2011	5.21	0.61				1.66	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		11/3/2010	4.89	0.29				1.98	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		10/25/2010	4.79	0.19				2.08	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		10/19/2010	4.7	0.1				2.17	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		10/13/2010	4.71	0.11				2.16	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		9/28/2010	4.86	0.26	4.82	0.22	0.04	2.04	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		7/29/2010			4.71		0.02	NA	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		6/10/2010			4.78		0.01	NA	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		6/22/2009	4.48	-0.12	4.48	-0.12	<0.01	2.4	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/23/2009	5.42	0.82	5.19	0.59	0.23	1.65	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/25/2008	4.96	0.36	4.95	0.35	0.01	1.92	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		8/18/2008	5.01	0.41	5	0.4	0.01	1.87	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		6/6/2008	4.98	0.38				1.89	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-132		3/31/2008	4.9	0.3	4.9	0.3	<0.01	1.98	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/15/2007	4.76	0.16	4.76	0.16	<0.01	2.12	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		9/18/2007	9.35	4.75				-2.48	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		6/4/2007	5.46	0.86	5.21	0.61	0.25	1.63	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/2/2007	4.81	0.21	4.56	-0.04	0.25	2.28	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/7/2006			4.83		0.18	NA	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		8/29/2006	4.52	-0.08	4.25	-0.35	0.27	2.58	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		5/24/2006	5.06	0.46	4.85	0.25	0.21	1.99	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		2/8/2006			4.89		0.22	2.99	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		7/1/2005						2.76	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		5/19/2005	5.88	1.28	4.85	0.25	1.03	1.88	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/9/2005	5.79	1.19	4.8	0.2	0.99	1.94	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/8/2004	5.25	0.65	4.21	-0.39	1.04	2.52	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		9/17/2004	5.45	0.85	4.43	-0.17	1.02	2.3	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		6/28/2004	5.6	1	4.53	-0.07	1.07	2.2	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-132		3/11/2004	5.35	0.75	4.44	-0.16	0.91	2.31	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/24/2003	5.68	1.08	4.66	0.06	1.02	2.07	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		8/20/2003	5.89	1.29	4.98	0.38	0.91	1.77	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		5/20/2003	5.39	0.79	4.4	-0.2	0.99	2.34	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		4/28/2003	5.48	0.88	4.54	-0.06	0.94	2.2	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		4/25/2003	5.38	0.78	4.62	0.02	0.76	2.15	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/21/2003	4.99	0.39	4.24	-0.36	0.75	2.53	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/21/2002	4.97	0.37	4.29	-0.31	0.68	2.49	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/20/2002	5.96	1.36	4	-0.6	1.96	2.61	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/31/2002	6.15	1.55	4.4	-0.2	1.75	2.23	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		9/23/2002	6.25	1.65	4.63	0.03	1.62	2.02	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-132		8/12/2002	5.26	0.66	5.26	0.66	<0.01	1.62	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		6/14/2002	6.17	1.57	4.45	-0.15	1.72	2.19	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		3/19/2002						NA	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		3/11/2002						NA	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132		2/19/2002	6.1	1.5	5.11	0.51	0.99	1.63	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		12/11/2001	4.6	0	4.58	-0.02	0.02	2.29	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/8/2001	4.52	-0.08	4.52	-0.08	<0.01	2.36	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/2/2001	4.63	0.03	4.63	0.03	<0.01	2.25	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		11/1/2001	4.92	0.32	4.91	0.31	0.01	1.96	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/26/2001	4.51	-0.09	4.51	-0.09	<0.01	2.37	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/25/2001	5.14	0.54	4.7	0.1	0.44	2.11	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/17/2001	5.08	0.48	4.7	0.1	0.38	2.12	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		10/11/2001	5.05	0.45	4.67	0.07	0.38	2.15	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-132		10/2/2001	5.44	0.84	5.23	0.63	0.21	1.61	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		9/19/2001	5.28	0.68	5.07	0.47	0.21	1.77	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		9/7/2001	4.76	0.16	4.76	0.16	<0.01	2.12	6.87	2.27	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-132		9/5/2001	4.75	0.15				2.12	6.87	2.27	11			-	Stick Up	Yes	RW - Inactive	
B-132D		5/11/2017	16.55					-6.24	10.31		85			-			MW	
B-132D		5/11/2016	16.45					-6.14	10.31		85			-			MW	
B-132D		5/3/2016	14.96					-4.65	10.31		85			-			MW	
B-132D		5/15/2015	15.62					-5.31	10.31		85			-			MW	
B-132D		12/4/2014	15.49					-5.18	10.31		85			-			MW	
B-132D		5/15/2014	15.57					-5.26	10.31		85			-			MW	
B-132D		10/16/2013	15.77					-5.46	10.31		85			-			MW	
B-132D		3/28/2013	17.05					-6.74	10.31		85			-			MW	
B-132D		3/21/2013	16.76					-6.45	10.31		85			-			MW	
B-132D		10/25/2012	15.55					-5.24	10.31		85			-			MW	
B-132D		5/9/2012	14.45					-4.14	10.31		85			-			MW	
B-132D		5/18/2011	13.81					-3.5	10.31		85			-			MW	
B-132D		7/30/2010						NA	10.31		85			-			MW	
B-132D		11/25/2008						NA	10.31		85			-			MW	
B-133		5/11/2017	5.01	0.98				2.32	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/1/2016	4.96	0.93				2.37	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/12/2016	5.08	1.05				2.25	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/11/2016	4.97	0.94				2.36	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/5/2016	4.91	0.88				2.42	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/8/2016	4.64	0.61	4.63	0.6	0.01	2.7	7.33	3.3	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/19/2015	5.04	1.01				2.29	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/3/2015	4.99	0.96				2.34	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/15/2015	5.26	1.23				2.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/13/2015	5.3	1.27				2.03	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/9/2014	4.65	0.62				2.68	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/15/2014	5.12	1.09				2.21	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/16/2013	5.04	1.01				2.29	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/12/2013	4.94	0.91				2.39	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/28/2013	5.08	1.05				2.25	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/9/2012	5.03	1				2.3	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/18/2011	5.15	1.12	5.15	1.12	<0.01	2.19	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		9/28/2010	5.11	1.08				2.22	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/29/2010			5.09		<0.01	NA	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/22/2009	4.96	0.93				2.37	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/23/2009	5.36	1.33	5.36	1.33	<0.01	1.98	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/25/2008	5.29	1.26	5.29	1.26	<0.01	2.05	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		6/6/2008	5.33	1.3				2	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-133		11/15/2007	4.95	0.92	4.95	0.92	<0.01	2.39	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		9/18/2007	5.49	1.46	5.49	1.46	<0.01	1.85	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		6/4/2007	5.26	1.23	5.25	1.22	0.01	2.08	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		3/2/2007	4.9	0.87	4.9	0.87	<0.01	2.44	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/7/2006						NA	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/29/2006	4.39	0.36	4.31	0.28	0.08	3	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		5/24/2006	5.2	1.17	5.19	1.16	0.01	2.14	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		2/8/2006						3.46	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/1/2005			5.19		0.01	3.25	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/19/2005	5.16	1.13				2.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/20/2005	4.76	0.73				2.57	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/9/2005	4.9	0.87				2.43	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		1/12/2005	4.76	0.73				2.57	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/3/2004	5	0.97				2.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/24/2004	5	0.97				2.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/16/2004	5	0.97				2.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/12/2004	5	0.97				2.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/5/2004	5	0.97				2.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/22/2004	4.43	0.4				2.9	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/8/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/24/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/17/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/10/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/2/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/24/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/11/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/4/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/27/2004	5.5	1.47				1.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/21/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/14/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/9/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/28/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/10/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/28/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/18/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/12/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/7/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/29/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/22/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/15/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/6/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/2/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/25/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/17/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/11/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/3/2004	7.5	3.47				-0.17	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/17/2004	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/10/2004	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-133		2/3/2004	7.05	3.02				0.28	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		1/6/2004	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/30/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/22/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/8/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/2/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/24/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/19/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/11/2003	6.8	2.77				0.53	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		11/5/2003	4.73	0.7	4.73	0.7	<0.01	2.61	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/22/2003	4.87	0.84	4.85	0.82	0.02	2.48	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/13/2003	4.99	0.96	4.99	0.96	<0.01	2.35	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/7/2003	5.08	1.05	5.08	1.05	<0.01	2.26	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/1/2003	4.82	0.79				2.51	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/24/2003	6.9	2.87				0.43	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/8/2003	6.2	2.17	6.2	2.17	<0.01	1.14	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		9/3/2003	7.2	3.17	7.2	3.17	<0.01	0.14	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		8/27/2003	6.9	2.87				0.43	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/20/2003	7.1	3.07	7.1	3.07	<0.01	0.24	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		8/12/2003	7.4	3.37	7.4	3.37	<0.01	-0.06	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		8/6/2003	6	1.97				1.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/24/2003	6	1.97				1.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/18/2003	6	1.97				1.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/30/2003	6	1.97				1.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/17/2003	7.4	3.37	7.4	3.37	<0.01	-0.06	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		6/13/2003	6	1.97				1.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/2/2003	7.1	3.07				0.23	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/30/2003	6	1.97				1.33	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/20/2003	4.81	0.78				2.52	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/8/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/28/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/25/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/9/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/2/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/26/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/21/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/12/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/25/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/21/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/13/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/6/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		1/21/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-133		1/10/2003	9.25	5.22				-1.92	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/30/2002	8.8	4.77	8.8	4.77	<0.01	-1.46	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		12/27/2002	8.6	4.57	8.6	4.57	<0.01	-1.26	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		12/19/2002	9	4.97	9	4.97	<0.01	-1.66	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		12/4/2002	4.81	0.78	4.73	0.7	0.08	2.58	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/26/2002	4.41	0.38	4.41	0.38	<0.01	2.93	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/19/2002	4.35	0.32	4.35	0.32	<0.01	2.99	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/5/2002	8	3.97				-0.67	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/31/2002	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/22/2002	8	3.97				-0.67	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/18/2002	8	3.97				-0.67	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/10/2002	8.2	4.17				-0.87	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		10/4/2002	8.3	4.27				-0.97	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/23/2002	8.2	4.17				-0.87	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/20/2002	8.2	4.17				-0.87	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		9/4/2002	8.3	4.27	8.3	4.27	<0.01	-0.96	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		8/27/2002	8.29	4.26	8.29	4.26	<0.01	-0.95	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		8/12/2002	8.6	4.57				-1.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		8/9/2002	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/31/2002	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/22/2002	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/16/2002	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/12/2002	7.4	3.37				-0.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		7/1/2002	7.6	3.57				-0.27	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/27/2002	7.4	3.37				-0.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/19/2002	7.4	3.37				-0.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/14/2002	7.4	3.37				-0.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		6/7/2002	4.71	0.68	4.7	0.67	0.01	2.63	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		5/31/2002	5.38	1.35				1.95	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/21/2002	7.4	3.37				-0.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/15/2002	7.4	3.37				-0.07	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		5/1/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/24/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/19/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/12/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		4/2/2002	6.4	2.37				0.93	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/26/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/19/2002	5.26	1.23	5.16	1.13	0.1	2.15	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		3/11/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		3/5/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-133		3/1/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/19/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/11/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		2/7/2002	6.5	2.47				0.83	7.33	3.3	11			-	Stick Up	Yes	RW - Inactive	
B-133		12/11/2001	6.36	2.33	4.85	0.82	1.51	2.2	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/8/2001	6.47	2.44	4.74	0.71	1.73	2.26	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/2/2001	5.77	1.74	4.91	0.88	0.86	2.26	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		11/1/2001	6.81	2.78	4.83	0.8	1.98	2.13	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/26/2001	5.45	1.42	4.76	0.73	0.69	2.44	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/25/2001	6.05	2.02	4.63	0.6	1.42	2.43	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/17/2001	6.24	2.21	4.92	0.89	1.32	2.16	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/11/2001	6.28	2.25	5.1	1.07	1.18	2.01	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		10/2/2001	6.45	2.42	5.47	1.44	0.98	1.68	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		9/19/2001	6.2	2.17	5.19	1.16	1.01	1.95	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		9/7/2001	6.48	2.45	5.38	1.35	1.1	1.74	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133		9/5/2001	6.25	2.22	5.11	1.08	1.14	2	7.33	3.3	11	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-133D		5/11/2017	10.81	8.31				-2.21	8.6	6.1	65			-	Stick Up		MW	
B-133D		8/19/2016						-2.31	8.6	6.1	65			-	Stick Up		MW	
B-133D		5/11/2016	10.58	8.08				-1.98	8.6	6.1	65			-	Stick Up		MW	
B-133D		5/3/2016	10.31	7.81				-1.71	8.6	6.1	65			-	Stick Up		MW	
B-133D		5/15/2015	10.43	7.93				-1.83	8.6	6.1	65			-	Stick Up		MW	
B-133D		12/4/2014	11.09	8.59				-2.49	8.6	6.1	65			-	Stick Up		MW	
B-133D		5/15/2014	9.94	7.44				-1.34	8.6	6.1	65			-	Stick Up		MW	
B-133D		10/16/2013	10.68	8.18				-2.08	8.6	6.1	65			-	Stick Up		MW	
B-133D		3/28/2013	11.67	9.17				-3.07	8.6	6.1	65			-	Stick Up		MW	
B-133D		3/21/2013	11.18	8.68				-2.58	8.6	6.1	65			-	Stick Up		MW	
B-133D		11/2/2012	10.86	8.36				-2.26	8.6	6.1	65			-	Stick Up		MW	
B-133D		10/25/2012	10.86	8.36				-2.26	8.6	6.1	65			-	Stick Up		MW	
B-133D		5/9/2012	10.44	7.94				-1.84	8.6	6.1	65			-	Stick Up		MW	
B-133D		5/19/2011	9.63	7.13				-1.03	8.6	6.1	65			-	Stick Up		MW	
B-133D		7/29/2010						NA	8.6	6.1	65			-	Stick Up		MW	
B-133D		6/22/2009	10.15	7.65				-1.55	8.6	6.1	65			-	Stick Up		MW	
B-133D		11/25/2008	10.85	8.35				-2.25	8.6	6.1	65			-	Stick Up		MW	
B-133D		6/6/2008	10.85	8.35				-2.25	8.6	6.1	65			-	Stick Up		MW	
B-133D		11/15/2007	10.64	8.14				-2.04	8.6	6.1	65			-	Stick Up		MW	
B-133D		11/7/2006						NA	8.6	6.1	65			-	Stick Up		MW	

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-133D		5/24/2006	11.55	9.05				-2.95	8.6	6.1	65			-	Stick Up		MW	
B-134		5/11/2017	4.76	1.62				1.76	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/1/2016	4.42	1.28				2.1	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/12/2016	4.75	1.61	4.75	1.61	<0.01	1.77865	6.52	3.38	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-134		5/11/2016	4.62	1.48				1.9	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/11/2016	4.62	1.48				1.9	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/8/2016	5.01	1.87				1.51	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/19/2015	4.61	1.47				1.91	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/3/2015	4.6	1.46	4.6	1.46	<0.01	1.93	6.52	3.38	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-134		5/15/2015	4.9	1.76	4.89	1.75	0.01	1.63	6.52	3.38	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-134		2/13/2015	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/4/2014	4.85	1.71	4.85	1.71	<0.01	1.68	6.52	3.38	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-134		5/15/2014	4.85	1.71				1.67	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/16/2013	4.72	1.58				1.8	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/12/2013	4.33	1.19				2.19	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/28/2013	4.65	1.51	4.65	1.51	<0.01	1.88	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		5/9/2012	4.54	1.4				1.98	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/18/2011	4.76	1.62	4.76	1.62	<0.01	1.77	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/25/2010	4.63	1.49				1.89	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/19/2010	4.56	1.42				1.96	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/13/2010	4.68	1.54				1.84	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/28/2010	4.78	1.64	4.73	1.59	0.05	1.78	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		7/29/2010			4.6		0.04	NA	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/22/2009	4.52	1.38	4.4	1.26	0.12	2.1	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		3/23/2009	5.11	1.97	4.91	1.77	0.2	1.58	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/25/2008	4.97	1.83	4.96	1.82	0.01	1.56	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		6/6/2008	4.87	1.73				1.65	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/15/2007	4.75	1.61	4.54	1.4	0.21	1.95	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-134		9/18/2007	5.16	2.02	4.88	1.74	0.28	1.6	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		6/4/2007	5.05	1.91	4.8	1.66	0.25	1.69	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		3/2/2007	4.56	1.42	4.43	1.29	0.13	2.07	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/7/2006			4.61		0.23	NA	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/29/2006	4.28	1.14	4.1	0.96	0.18	2.4	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		5/24/2006	4.86	1.72	4.64	1.5	0.22	1.85	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		2/8/2006			4.59		0.17	2.92	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/1/2005			4.67		0.21	2.65	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/19/2005	4.82	1.68	4.79	1.65	0.03	1.73	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		4/20/2005	4.46	1.32	4.46	1.32	<0.01	2.07	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		3/9/2005	4.6	1.46	4.56	1.42	0.04	1.95	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		1/12/2005	4.5	1.36	4.5	1.36	<0.01	2.03	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		12/3/2004	4.75	1.61				1.77	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/24/2004	4.75	1.61				1.77	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/16/2004	4.75	1.61				1.77	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/12/2004	4.75	1.61				1.77	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/5/2004	4.75	1.61				1.77	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/22/2004	4.03	0.89	4.02	0.88	0.01	2.5	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/8/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/24/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-134		9/17/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/10/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/2/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/24/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/11/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/4/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/27/2004	5	1.86				1.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/21/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/14/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/9/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/28/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/10/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/28/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/18/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/12/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/7/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/29/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/22/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/15/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/6/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/2/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/25/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/17/2004	6.2	3.06				0.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/11/2004	5.3	2.16				1.22	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/3/2004	5.3	2.16				1.22	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/17/2004	6	2.86				0.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/10/2004	6	2.86				0.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/3/2004	4.88	1.74				1.64	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		1/6/2004	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/30/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/22/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/8/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/2/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/24/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/19/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/11/2003	5.9	2.76				0.62	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		11/5/2003	4.22	1.08				2.3	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/22/2003	4.35	1.21				2.17	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/13/2003	4.38	1.24	4.38	1.24	<0.01	2.15	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/7/2003	4.55	1.41				1.97	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/1/2003	4.38	1.24				2.14	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/24/2003	6	2.86				0.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/8/2003	4.63	1.49	4.63	1.49	<0.01	1.9	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		9/3/2003	5.6	2.46	5.6	2.46	<0.01	0.93	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		8/27/2003	6	2.86				0.52	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-134		8/20/2003	5.7	2.56	5.7	2.56	<0.01	0.83	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		8/12/2003	5.9	2.76	5.9	2.76	<0.01	0.63	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		8/6/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/24/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/18/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/30/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/26/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/17/2003	5.4	2.26				1.12	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/13/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/2/2003	5.2	2.06				1.32	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/30/2003	5.5	2.36				1.02	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/20/2003	4.22	1.08				2.3	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/8/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/28/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/25/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/9/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/2/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/26/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/21/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/12/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/25/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/21/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/13/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/6/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		1/21/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		1/10/2003	8.65	5.51				-2.13	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/30/2002	8.55	5.41	8.55	5.41	<0.01	-2.02	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		12/27/2002	4.94	1.8	4.17	1.03	0.77	2.25	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		12/19/2002	4.72	1.58	3.93	0.79	0.79	2.48	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		12/4/2002	4.85	1.71	4.1	0.96	0.75	2.32	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/26/2002	3.74	0.6	3.74	0.6	<0.01	2.79	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-134		11/19/2002	3.91	0.77	3.91	0.77	<0.01	2.62	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/5/2002	7.2	4.06				-0.68	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/31/2002	7.1	3.96				-0.58	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/22/2002	7.2	4.06				-0.68	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/18/2002	7.2	4.06				-0.68	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/10/2002	7.2	4.06				-0.68	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		10/4/2002	7.05	3.91				-0.53	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/23/2002	7.2	4.06				-0.68	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/20/2002	7.2	4.06				-0.68	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		9/4/2002	7.2	4.06	7.2	4.06	<0.01	-0.67	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		8/27/2002	7.18	4.04				-0.66	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/12/2002	7.7	4.56				-1.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		8/9/2002	7.7	4.56				-1.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/31/2002	7.7	4.56				-1.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/22/2002	7.7	4.56				-1.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/16/2002	7.7	4.56				-1.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/12/2002	8.1	4.96				-1.58	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		7/1/2002	7.71	4.57	7.71	4.57	<0.01	-1.18	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		6/27/2002	8.1	4.96				-1.58	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/19/2002	8.1	4.96				-1.58	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		6/14/2002	8.17	5.03	8.17	5.03	<0.01	-1.64	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		6/7/2002	4.43	1.29	4.22	1.08	0.21	2.27	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		5/31/2002	4.7	1.56				1.82	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		5/21/2002	8.12	4.98	8.12	4.98	<0.01	-1.59	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		5/15/2002	8.7	5.56	8.7	5.56	<0.01	-2.17	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		5/1/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/24/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/19/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/12/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		4/2/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/26/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-134		3/19/2002	5.44	2.3	4.5	1.36	0.94	1.89	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		3/11/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/5/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		3/1/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/19/2002	7.3	4.16				-0.78	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/11/2002	6.7	3.56				-0.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		2/7/2002	6.7	3.56				-0.18	6.52	3.38	11			-	Stick Up	Yes	RW - Inactive	
B-134		12/11/2001	6.28	3.14	4.05	0.91	2.23	2.17	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/8/2001	5.26	2.12	4.09	0.95	1.17	2.27	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/2/2001	4.96	1.82	4.23	1.09	0.73	2.19	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		11/1/2001	6.12	2.98	4.14	1	1.98	2.11	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/26/2001	5.12	1.98	4.09	0.95	1.03	2.29	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/25/2001	5.96	2.82	3.89	0.75	2.07	2.35	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/17/2001	6.25	3.11	4.15	1.01	2.1	2.09	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/11/2001	6.08	2.94	4.07	0.93	2.01	2.18	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		10/2/2001	6.5	3.36	4.35	1.21	2.15	1.88	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-134		9/19/2001	6.2	3.06	4.32	1.18	1.88	1.95	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		9/7/2001	5.42	2.28	4.48	1.34	0.94	1.91	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134		9/5/2001	4.8	1.66	4.42	1.28	0.38	2.05	6.52	3.38	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-134D		5/11/2017	11.93	9.26				-3.81	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/11/2016	11.74	9.07				-3.62	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/3/2016	11.16	8.49				-3.04	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/15/2015	11.38	8.71				-3.26	8.12	5.45	79			-	Stick Up		MW	
B-134D		12/4/2014	11.77	9.1				-3.65	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/15/2014	11.18	8.51				-3.06	8.12	5.45	79			-	Stick Up		MW	
B-134D		10/16/2013	11.57	8.9				-3.45	8.12	5.45	79			-	Stick Up		MW	
B-134D		3/28/2013	12.74	10.07				-4.62	8.12	5.45	79			-	Stick Up		MW	
B-134D		3/21/2013	12.21	9.54				-4.09	8.12	5.45	79			-	Stick Up		MW	
B-134D		11/2/2012	11.88	9.21				-3.76	8.12	5.45	79			-	Stick Up		MW	
B-134D		10/25/2012	11.88	9.21				-3.76	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/9/2012	11.24	8.57				-3.12	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/18/2011	10.56	7.89				-2.44	8.12	5.45	79			-	Stick Up		MW	
B-134D		7/29/2010						NA	8.12	5.45	79			-	Stick Up		MW	
B-134D		6/22/2009	10.91	8.24				-2.79	8.12	5.45	79			-	Stick Up		MW	
B-134D		11/25/2008	11.44	8.77				-3.32	8.12	5.45	79			-	Stick Up		MW	
B-134D		6/6/2008	11.86	9.19				-3.74	8.12	5.45	79			-	Stick Up		MW	
B-134D		11/15/2007	11.68	9.01				-3.56	8.12	5.45	79			-	Stick Up		MW	
B-134D		6/4/2007	3.95	1.28				4.17	8.12	5.45	79			-	Stick Up		MW	
B-134D		11/7/2006						NA	8.12	5.45	79			-	Stick Up		MW	
B-134D		5/24/2006	12.67	10				-4.55	8.12	5.45	79			-	Stick Up		MW	
B-135		5/11/2017	4.93	1.86	4.91	1.84	0.02	1.46731	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		3/6/2017	5.33	2.26	5.14	2.07	0.19	1.21443	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		12/1/2016	4.53	1.46	4.42	1.35	0.11	1.94519	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		8/12/2016	5.13	2.06	4.87	1.8	0.26	1.475	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		5/11/2016	4.87	1.8	4.75	1.68	0.12	1.61	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		11/19/2015	4.69	1.62	4.68	1.61	0.01	1.7	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		5/15/2015	4.95	1.88	4.91	1.84	0.04	1.46	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		2/13/2015	5.15	2.08				1.23	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		12/4/2014	4.96	1.89	4.95	1.88	0.01	1.43	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		8/11/2014	4.93	1.86	4.91	1.84	0.02	1.47	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		5/15/2014	4.9	1.83	4.87	1.8	0.03	1.51	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		1/23/2014	4.96	1.89	4.96	1.89	<0.01	1.43	6.38	3.31	11	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-135		10/16/2013	4.79	1.72				1.59	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-135		7/12/2013	4.38	1.31	4.38	1.31	<0.01	2.01	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		3/28/2013	4.56	1.49	4.56	1.49	<0.01	1.83	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		2/15/2013	4.78	1.71				1.6	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/10/2012	4.74	1.67	4.74	1.67	<0.01	1.65	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		7/30/2012	4.71	1.64	4.71	1.64	<0.01	1.68	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		5/9/2012	4.61	1.54				1.77	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		1/30/2012	5.03	1.96	5.03	1.96	<0.01	1.36	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		10/21/2011	4.95	1.88	4.95	1.88	<0.01	1.44	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		8/1/2011	4.92	1.85	4.91	1.84	0.01	1.47	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		5/18/2011	4.88	1.81	4.88	1.81	<0.01	1.51	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		2/23/2011	5.08	2.01	5.08	2.01	<0.01	1.31	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		11/3/2010	4.77	1.7				1.61	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/25/2010	4.82	1.75	4.82	1.75	<0.01	1.57	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		10/19/2010	4.67	1.6				1.71	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/13/2010	4.87	1.8	4.81	1.74	0.06	1.56	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-135		9/28/2010	4.91	1.84	4.8	1.73	0.11	1.57	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		7/29/2010			4.58		0.1	NA	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		6/10/2010			4.6		0.07	NA	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		6/22/2009	4.45	1.38	4.45	1.38	<0.01	1.94	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		3/23/2009	5.06	1.99	4.85	1.78	0.21	1.5	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		11/25/2008	4.89	1.82	4.67	1.6	0.22	1.68	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		8/18/2008	5.02	1.95	4.99	1.92	0.03	1.39	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		6/6/2008	4.72	1.65	4.66	1.59	0.06	1.71	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		3/31/2008	4.78	1.71	4.74	1.67	0.04	1.63	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		11/15/2007	4.62	1.55	4.47	1.4	0.15	1.89	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		9/18/2007	6.4	3.33				-0.02	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		6/4/2007	6.7	3.63				-0.32	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		3/2/2007	4.69	1.62	4.25	1.18	0.44	2.07	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		11/7/2006						NA	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		8/29/2006	4.88	1.81	4.13	1.06	0.75	2.15	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-135		5/24/2006	5.12	2.05	4.43	1.36	0.69	1.86	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		2/8/2006			4.58		0.43	2.47	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		7/1/2005						2.01	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		5/19/2005	6.1	3.03	4.51	1.44	1.59	1.66	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		3/9/2005	5.51	2.44	4.58	1.51	0.93	1.67	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		10/8/2004	5.12	2.05	3.84	0.77	1.28	2.37	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		9/17/2004	4.98	1.91	3.98	0.91	1	2.27	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		6/28/2004	4.75	1.68	4.31	1.24	0.44	2.01	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		3/11/2004	4.41	1.34				1.97	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		11/24/2003	4.65	1.58	4.42	1.35	0.23	1.93	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		8/20/2003	5.48	2.41	4.5	1.43	0.98	1.75	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		5/20/2003	4.54	1.47	3.93	0.86	0.61	2.37	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		3/21/2003	4.51	1.44	4.03	0.96	0.48	2.29	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		10/31/2002	4.41	1.34				1.97	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		9/23/2002	4.68	1.61	4.42	1.35	0.26	1.93	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-135		8/12/2002	4.62	1.55	4.62	1.55	<0.01	1.77	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		6/14/2002	4.46	1.39	4.38	1.31	0.08	1.99	6.38	3.31	11	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-135		2/19/2002	4.54	1.47				1.84	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		12/11/2001	4.09	1.02				2.29	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		11/8/2001	4.06	0.99				2.32	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		11/2/2001	4.14	1.07				2.24	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		11/1/2001	4.14	1.07				2.24	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/26/2001	3.98	0.91				2.4	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/25/2001	4.06	0.99				2.32	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/17/2001	4.14	1.07				2.24	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/11/2001	4.1	1.03				2.28	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		10/2/2001	4.52	1.45				1.86	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		9/19/2001	4.38	1.31				2	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		9/7/2001	4.17	1.1				2.21	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-135		9/5/2001	4.26	1.19				2.12	6.38	3.31	11			-	Stick Up	Yes	RW - Inactive	
B-136		5/11/2017	4.92	2.08	4.89	2.05	0.03	4.25596	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		3/6/2017	6.42	3.58	6.38	3.54	0.04	2.76462	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		12/1/2016	4.57	1.73	4.56	1.72	0.01	4.58865	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		8/12/2016	5.39	2.55	5.37	2.53	0.02	3.77731	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		5/11/2016	4.98	2.14	4.96	2.12	0.02	4.19	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		2/8/2016	4.11	1.27	4.08	1.24	0.03	5.07	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		11/19/2015	5.25	2.41	5.23	2.39	0.02	3.92	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		8/3/2015	4.88	2.04	4.87	2.03	0.01	4.28	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		5/15/2015	6.25	3.41	6.23	3.39	0.02	2.92	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		2/13/2015	4.6	1.76	4.57	1.73	0.03	4.58	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		12/9/2014	4.07	1.23	4.06	1.22	0.01	5.09	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		8/11/2014	4.94	2.1	4.92	2.08	0.02	4.23	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		5/15/2014	4.86	2.02	4.84	2	0.02	4.31	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		1/23/2014	4.5	1.66	4.49	1.65	0.01	4.66	9.15	6.31	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-136		10/16/2013	4.66	1.82	4.65	1.81	0.01	4.5	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		7/12/2013	4.19	1.35	4.18	1.34	0.01	4.97	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		3/28/2013	4.21	1.37	4.21	1.37	<0.01	4.95	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		2/15/2013	4.35	1.51	4.35	1.51	<0.01	4.81	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/10/2012	5.14	2.3	5.14	2.3	<0.01	4.02	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		7/30/2012	5.62	2.78	5.61	2.77	0.01	3.54	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		5/9/2012	4.83	1.99	4.82	1.98	0.01	4.33	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		1/30/2012	3.46	0.62	3.45	0.61	0.01	5.7	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/21/2011	4.48	1.64	4.47	1.63	0.01	4.68	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		8/1/2011	5.92	3.08	5.91	3.07	0.01	3.24	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		5/18/2011	5.25	2.41	5.25	2.41	<0.01	3.91	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		2/23/2011	5.28	2.44	5.28	2.44	<0.01	3.88	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/3/2010	4.97	2.13				4.18	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/25/2010	4.43	1.59				4.72	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/19/2010	4.02	1.18				5.13	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		10/13/2010	4.32	1.48	4.25	1.41	0.07	4.89	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		9/28/2010	5.53	2.69	5.32	2.48	0.21	3.8	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		7/29/2010			4.72		0.1	NA	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/10/2010			4.35		0.07	NA	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/22/2009	4.85	2.01	4.85	2.01	<0.01	4.31	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		3/23/2009	6.29	3.45	6.29	3.45	<0.01	2.87	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/25/2008	8.05	5.21	8.05	5.21	<0.01	1.11	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		6/6/2008	7.2	4.36				1.95	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/15/2007	5.41	2.57				3.74	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/18/2007	8	5.16				1.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/4/2007	9.1	6.26				0.05	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/2/2007	4.35	1.51	3.72	0.88	0.63	5.35	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/7/2006			4.33		0.64	NA	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		8/29/2006	4.47	1.63	3.83	0.99	0.64	5.23	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		5/24/2006	5.95	3.11	5.92	3.08	0.03	3.23	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		2/8/2006			4.31		0.53	5.51	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/1/2005			5.83		0.52	3.99	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/19/2005	6.07	3.23	6.01	3.17	0.06	3.13	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		4/20/2005	4.54	1.7	4.49	1.65	0.05	4.65	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

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LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		3/9/2005	4.61	1.77	4.61	1.77	<0.01	4.55	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		1/12/2005	4.55	1.71	4.55	1.71	<0.01	4.61	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		12/3/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/24/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/16/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/12/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/5/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/22/2004	4.75	1.91	4.75	1.91	<0.01	4.41	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/8/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/24/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/17/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/10/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/2/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		8/24/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		8/11/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		8/4/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/27/2004	5.5	2.66				3.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/21/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/14/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/9/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/28/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/10/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/28/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/18/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/12/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/7/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/29/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/22/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/15/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/6/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/2/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/25/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/17/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/11/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/3/2004	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/17/2004	7.55	4.71				1.6	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/10/2004	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/3/2004	7.16	4.32				1.99	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		1/6/2004	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/30/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/22/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/8/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/2/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/24/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/19/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		11/11/2003	7.3	4.46				1.85	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		11/5/2003	4.79	1.95	4.79	1.95	<0.01	4.37	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/22/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/13/2003	6.95	4.11	6.95	4.11	<0.01	2.21	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/7/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/1/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/24/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/8/2003	7.2	4.36	7.2	4.36	<0.01	1.96	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		9/3/2003	7.2	4.36	7.2	4.36	<0.01	1.96	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		8/27/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		8/20/2003	7.2	4.36	7.2	4.36	<0.01	1.96	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		8/12/2003	7.1	4.26	7.1	4.26	<0.01	2.06	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		8/6/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/24/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/18/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/30/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/26/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/17/2003	5.62	2.78				3.53	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/13/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/2/2003	7.2	4.36				1.95	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/30/2003	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/20/2003	5.79	2.95	5.79	2.95	<0.01	3.37	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		5/8/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/28/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/25/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/9/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/2/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/26/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/21/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/12/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/25/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/21/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/13/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		2/6/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		1/21/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		1/10/2003	7.6	4.76				1.55	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/30/2002	7.6	4.76	7.6	4.76	<0.01	1.56	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		12/27/2002	4.56	1.72	4.44	1.6	0.12	4.69	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		12/19/2002	4.25	1.41	4.25	1.41	<0.01	4.91	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		12/4/2002	4.73	1.89	4.68	1.84	0.05	4.46	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/26/2002	4.06	1.22	4.01	1.17	0.05	5.13	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/19/2002	4.13	1.29	4.11	1.27	0.02	5.04	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/5/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/31/2002	7.4	4.56				1.75	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/22/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/18/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/10/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		10/4/2002	7.4	4.56				1.75	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/23/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/20/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		9/4/2002	7.4	4.56	7.4	4.56	<0.01	1.76	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		8/27/2002	7.55	4.71	7.55	4.71	<0.01	1.61	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		8/12/2002	7.5	4.66				1.65	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		8/9/2002	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/31/2002	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/22/2002	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/16/2002	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/12/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		7/1/2002	7	4.16				2.15	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/27/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/19/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		6/14/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		6/7/2002	5.27	2.43	5.25	2.41	0.02	3.9	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		5/31/2002	5.76	2.92	5.56	2.72	0.2	3.56	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		5/21/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/15/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		5/1/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/24/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/19/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/12/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		4/2/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/26/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/19/2002	6.51	3.67	5.57	2.73	0.94	3.45	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		3/11/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/5/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		3/1/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/19/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/11/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		2/7/2002	6.8	3.96				2.35	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		1/21/2002	7.1	4.26				2.05	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		1/15/2002	7.1	4.26				2.05	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		1/4/2002	7.1	4.26				2.05	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/27/2001	6.12	3.28	5.6	2.76	0.52	3.48	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		12/20/2001	6.92	4.08	6.92	4.08	<0.01	2.24	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		12/11/2001	7.1	4.26				2.05	9.15	6.31	12			-	Stick Up	Yes	RW - Inactive	
B-136		12/6/2001	7.21	4.37	7.21	4.37	<0.01	1.95	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/8/2001	9.98	7.14	5.32	2.48	4.66	3.2	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		11/2/2001	9.65	6.81	5.41	2.57	4.24	3.17	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-136		11/1/2001	10.33	7.49	5.46	2.62	4.87	3.03	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/26/2001	9.63	6.79	5.26	2.42	4.37	3.3	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/25/2001	10.24	7.4	5.01	2.17	5.23	3.44	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/17/2001	10.39	7.55	5.08	2.24	5.31	3.36	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/11/2001	10.45	7.61	5.1	2.26	5.35	3.33	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		10/2/2001	10.21	7.37	4.99	2.15	5.22	3.46	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		9/19/2001	10.14	7.3	5.28	2.44	4.86	3.22	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		9/7/2001	9.68	6.84	5.26	2.42	4.42	3.3	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-136		9/5/2001	9.46	6.62	5.28	2.44	4.18	3.31	9.15	6.31	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		5/11/2017	4.39	1.88	4.29	1.78	0.1	4.42654	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		3/6/2017	6.07	3.56	5.21	2.7	0.86	3.40424	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		12/1/2016	5.29	2.78	4.66	2.15	0.63	3.9852	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		8/12/2016	5.33	2.82	4.59	2.08	0.74	4.0404	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		5/11/2016	5.07	2.56	4.92	2.41	0.15	3.79	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		2/8/2016	4.29	1.78	3.75	1.24	0.54	4.91	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		11/19/2015	5.14	2.63	4.74	2.23	0.4	3.94	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		8/3/2015	4.6	2.09	4.14	1.63	0.46	4.53	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		5/15/2015	5.3	2.79	5.09	2.58	0.21	3.61	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		2/13/2015	4.51	2				4.22	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/4/2014	4.84	2.33	4.2	1.69	0.64	4.44	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		8/11/2014	4.61	2.1	4.45	1.94	0.16	4.26	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		5/15/2014	4.45	1.94	4.29	1.78	0.16	4.42	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		1/23/2014	4.83	2.32	4.3	1.79	0.53	4.36	8.73	6.22	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-137		10/16/2013	4.66	2.15	4.24	1.73	0.42	4.43	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		7/12/2013	3.52	1.01				5.21	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/28/2013	4.26	1.75	4.26	1.75	<0.01	4.48	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		2/15/2013	4.16	1.65	3.81	1.3	0.35	4.87	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/10/2012	4.67	2.16				4.06	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/30/2012	4.85	2.34	4.26	1.75	0.59	4.39	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		5/9/2012	4.53	2.02	4.22	1.71	0.31	4.47	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		1/30/2012	4.07	1.56				4.66	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/21/2011	4.38	1.87				4.35	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/1/2011	4.65	2.14	4.65	2.14	<0.01	4.09	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		5/18/2011	4.44	1.93	4.44	1.93	<0.01	4.3	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		2/23/2011	4.97	2.46	4.25	1.74	0.72	4.38	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		11/3/2010	4.29	1.78	4.29	1.78	<0.01	4.45	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/25/2010	3.88	1.37				4.85	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/19/2010	3.7	1.19				5.03	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/13/2010						NA	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/28/2010	4.53	2.02	4.51	2	0.02	4.22	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		7/29/2010			3.63		1.27	NA	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/10/2010			4.05		0.54	NA	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/22/2009	3.67	1.16	3.67	1.16	<0.01	5.07	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		3/23/2009	6.23	3.72	5	2.49	1.23	3.56	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/25/2008	7.9	5.39				0.83	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/6/2008	9.29	6.78				-0.56	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/15/2007	4.41	1.9	4.41	1.9	<0.01	4.33	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		9/18/2007	9.2	6.69				-0.47	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/4/2007	12.5	9.99				-3.77	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/2/2007	4.6	2.09	4.08	1.57	0.52	4.58	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/7/2006						NA	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/29/2006	9.51	7				-0.78	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/24/2006	9.65	7.14				-0.92	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/8/2006			3.74		3.15	5.44	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/1/2005			4.79		0.34	4.76	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/19/2005	5.4	2.89				3.33	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/20/2005	4.37	1.86	3.51	1	0.86	5.1	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		3/9/2005	3.98	1.47	3.71	1.2	0.27	4.98	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		1/12/2005	3.72	1.21	3.71	1.2	0.01	5.02	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		12/3/2004	5.3	2.79				3.43	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/24/2004	5.3	2.79				3.43	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/16/2004	5.3	2.79				3.43	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/12/2004	5.3	2.79				3.43	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/5/2004	5.3	2.79				3.43	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/22/2004	3.63	1.12				5.1	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/8/2004	4.5	1.99				4.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/24/2004	4.7	2.19				4.03	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/17/2004	4.7	2.19				4.03	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/10/2004	4.7	2.19				4.03	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/2/2004	4.5	1.99				4.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/24/2004	4.5	1.99				4.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/11/2004	4.5	1.99				4.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/4/2004	4.5	1.99				4.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/27/2004	4.5	1.99				4.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/21/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/14/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/9/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/28/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/10/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/28/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/18/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/12/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/7/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/29/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/22/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/15/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/6/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/2/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/25/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/17/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/11/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/3/2004	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/17/2004	7.05	4.54	4.45	1.94	2.6	3.93	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		2/10/2004	7.2	4.69	3.58	1.07	3.62	4.66	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		2/3/2004	7.21	4.7	5.43	2.92	1.78	3.06	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		1/6/2004	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/30/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/22/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/8/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/2/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/24/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/19/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		11/11/2003	7.5	4.99				1.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		11/5/2003	3.81	1.3	3.8	1.29	0.01	4.93	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/22/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/13/2003	5.38	2.87	5.38	2.87	<0.01	3.36	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/7/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/1/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/24/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/8/2003	5.9	3.39	5.9	3.39	<0.01	2.84	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		9/3/2003	5.9	3.39	5.9	3.39	<0.01	2.84	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		8/27/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/20/2003	6	3.49	6	3.49	<0.01	2.74	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		8/12/2003	6.4	3.89	6.4	3.89	<0.01	2.34	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		8/6/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/24/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/18/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/30/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/26/2003	6.5	3.99				2.23	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/17/2003	4.6	2.09	3.95	1.44	0.65	4.69	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		6/13/2003	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/2/2003	6.4	3.89				2.33	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/30/2003	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/20/2003	5.16	2.65	4.75	2.24	0.41	3.92	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		5/8/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/28/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/25/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/9/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/2/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/26/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/21/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		3/12/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/25/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/21/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/13/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/6/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		1/21/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		1/10/2003	6.6	4.09				2.13	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/30/2002	6.5	3.99	6.5	3.99	<0.01	2.24	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		12/27/2002	5.4	2.89	3.64	1.13	1.76	4.85	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		12/19/2002	6.15	3.64	3.05	0.54	3.1	5.26	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		12/4/2002	5.84	3.33	3.8	1.29	2.04	4.66	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/26/2002	4.36	1.85	3.2	0.69	1.16	5.37	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/19/2002	4.59	2.08	3.35	0.84	1.24	5.21	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/5/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/31/2002	6.95	4.44				1.78	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/22/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/18/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/10/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		10/4/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/23/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/20/2002	7.1	4.59				1.63	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		9/4/2002	7	4.49				1.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/27/2002	7.05	4.54	7.05	4.54	<0.01	1.69	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		8/12/2002	7.2	4.69				1.53	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		8/9/2002	7.2	4.69				1.53	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/31/2002	7.2	4.69				1.53	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/22/2002	7.2	4.69				1.53	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/16/2002	6.4	3.89				2.33	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/12/2002	6.4	3.89				2.33	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		7/1/2002	6.4	3.89				2.33	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/27/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/19/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		6/14/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		6/7/2002	4.44	1.93	4.32	1.81	0.12	4.39	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		5/31/2002	4.43	1.92	4.43	1.92	<0.01	4.31	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		5/21/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/15/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		5/1/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/24/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/19/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/12/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		4/2/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/26/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/19/2002	6.84	4.33	5.45	2.94	1.39	3.09	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		3/11/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/5/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		3/1/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/19/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/11/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		2/7/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		1/21/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		1/15/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		1/4/2002	6	3.49				2.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/27/2001	4.89	2.38	4.88	2.37	0.01	3.85	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		12/20/2001	5.81	3.3	5.81	3.3	<0.01	2.93	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		12/11/2001	5	2.49				3.73	8.73	6.22	12			-	Stick Up	Yes	RW - Inactive	
B-137		12/6/2001	6.42	3.91	6.42	3.91	<0.01	2.32	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/8/2001	8.37	5.86	4.76	2.25	3.61	3.48	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		11/2/2001	7.91	5.4	4.84	2.33	3.07	3.48	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-137		11/1/2001	8.72	6.21	4.86	2.35	3.86	3.35	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/26/2001	7.9	5.39	4.75	2.24	3.15	3.56	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/25/2001	8.39	5.88	4.45	1.94	3.94	3.75	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/17/2001	8.36	5.85	4.54	2.03	3.82	3.68	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/11/2001	8.31	5.8	4.5	1.99	3.81	3.72	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		10/2/2001	8.68	6.17	4.24	1.73	4.44	3.89	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		9/19/2001	8.85	6.34	4.43	1.92	4.42	3.71	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		9/7/2001	8.61	6.1	4.34	1.83	4.27	3.82	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-137		9/5/2001	8.65	6.14	4.76	2.25	3.89	3.45	8.73	6.22	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-138		5/11/2017	4.47	1.2				4.86	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/1/2016	4.57	1.3				4.76	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/12/2016	4.78	1.51	4.77	1.5	0.01	4.55865	9.33	6.06	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/11/2016	4.25	0.98				5.08	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/8/2016	3.93	0.66				5.4	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		11/19/2015	5.03	1.76	5.03	1.76	<0.01	4.31	9.33	6.06	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		8/3/2015	4.29	1.02	4.29	1.02	<0.01	5.05	9.33	6.06	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/15/2015	5.35	2.08	5.35	2.08	<0.01	3.99	9.33	6.06	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		2/13/2015	4.53	1.26				4.8	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-138		12/4/2014	4.28	1.01	4.28	1.01	<0.01	5.06	9.33	6.06	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/15/2014	4.36	1.09	4.36	1.09	<0.01	4.98	9.33	6.06	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/16/2013	4.26	0.99	4.25	0.98	0.01	5.08	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		7/12/2013	4.38	1.11	4.34	1.07	0.04	4.98	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		3/28/2013	3.98	0.71	3.97	0.7	0.01	5.36	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/9/2012	4.48	1.21	4.47	1.2	0.01	4.86	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/18/2011	4.18	0.91	4.18	0.91	<0.01	5.16	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/25/2010	4.04	0.77				5.29	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/19/2010	3.87	0.6				5.46	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/13/2010	3.92	0.65				5.41	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/28/2010	5.03	1.76	4.93	1.66	0.1	4.38	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		7/29/2010			3.82		0.06	NA	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/22/2009	3.73	0.46	3.7	0.43	0.03	5.62	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		3/23/2009	5.48	2.21	5.38	2.11	0.1	3.93	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/25/2008	5.09	1.82	5.04	1.77	0.05	4.28	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		6/6/2008	3.74	0.47	3.58	0.31	0.16	5.72	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/15/2007	4.63	1.36	4.55	1.28	0.08	4.76	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		9/18/2007	5.9	2.63	5.64	2.37	0.26	3.64	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		6/4/2007	5.15	1.88	4.81	1.54	0.34	4.46	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		3/2/2007	4.39	1.12	4.32	1.05	0.07	5	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/7/2006						NA	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/29/2006	9.35	6.08				-0.02	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/24/2006	9.2	5.93	3.95	0.68	5.25	4.39	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		2/8/2006			4.06		0.43	6.06	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/1/2005			4.93		0.29	5.21	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/19/2005	4.85	1.58				4.48	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-138		4/20/2005	3.78	0.51	3.78	0.51	<0.01	5.56	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		3/9/2005	3.88	0.61	3.88	0.61	<0.01	5.46	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		1/12/2005	3.76	0.49	3.73	0.46	0.03	5.59	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/22/2004	3.68	0.41				5.65	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/8/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/24/2004	5	1.73				4.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/17/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/10/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/2/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/24/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/11/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/4/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/27/2004	4.5	1.23				4.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/21/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/14/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/9/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/28/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/10/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/28/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/18/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/12/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/7/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/29/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/22/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/15/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/6/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/2/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/25/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/17/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/11/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/3/2004	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/17/2004	6.5	3.23				2.83	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/10/2004	3.65	0.38				5.68	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/3/2004	5.29	2.02				4.04	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		1/6/2004	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/30/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/22/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/8/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/2/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		11/24/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		11/19/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		11/11/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		11/5/2003	3.91	0.64				5.42	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/22/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/13/2003	5.9	2.63	5.9	2.63	<0.01	3.44	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/7/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/1/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/24/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/8/2003	5.9	2.63	5.9	2.63	<0.01	3.44	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-138		9/3/2003	5.9	2.63	5.9	2.63	<0.01	3.44	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		8/27/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/20/2003	5.9	2.63	5.9	2.63	<0.01	3.44	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		8/12/2003	5.9	2.63	5.9	2.63	<0.01	3.44	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		8/6/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/24/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/18/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/30/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/26/2003	6.4	3.13				2.93	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/17/2003	3.85	0.58	3.84	0.57	0.01	5.49	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		6/13/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/2/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/30/2003	6	2.73				3.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/20/2003	4.95	1.68	4.95	1.68	<0.01	4.39	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/8/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/28/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/25/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/9/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/2/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/26/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/21/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/12/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/25/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/21/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/13/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/6/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		1/21/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		1/10/2003	7	3.73				2.33	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/30/2002	6.6	3.33	6.6	3.33	<0.01	2.74	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		12/27/2002	4.34	1.07	4.34	1.07	<0.01	5	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		12/19/2002	3.57	0.3	3.57	0.3	<0.01	5.77	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		12/4/2002	4.14	0.87	4.12	0.85	0.02	5.21	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/26/2002	3.72	0.45	3.71	0.44	0.01	5.62	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/19/2002	3.54	0.27	3.53	0.26	0.01	5.8	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/5/2002	6.6	3.33				2.73	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/31/2002	5.71	2.44	5.7	2.43	0.01	3.63	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-138		10/22/2002	6.6	3.33				2.73	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/18/2002	6.6	3.33				2.73	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/10/2002	6.6	3.33				2.73	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		10/4/2002	6.7	3.43				2.63	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/23/2002	6.6	3.33				2.73	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/20/2002	6.6	3.33				2.73	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		9/4/2002	4.65	1.38	4.55	1.28	0.1	4.76	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		8/27/2002	6.6	3.33	6.6	3.33	<0.01	2.74	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		8/12/2002	6.9	3.63				2.43	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		8/9/2002	6.9	3.63				2.43	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/31/2002	6.9	3.63				2.43	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/22/2002	6.9	3.63				2.43	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/16/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/12/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		7/1/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/27/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/19/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/14/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		6/7/2002	4.35	1.08	4.35	1.08	<0.01	4.99	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/31/2002	4.56	1.29	4.56	1.29	<0.01	4.78	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		5/21/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/15/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		5/1/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/24/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/19/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/12/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		4/2/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/26/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/19/2002	5.24	1.97	4.82	1.55	0.42	4.43	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		3/11/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/5/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		3/1/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/19/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/11/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		2/7/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		1/21/2002	6.3	3.03				3.03	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		1/15/2002	6.2	2.93				3.13	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		1/4/2002	6.2	2.93				3.13	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/27/2001	5.62	2.35	4.98	1.71	0.64	4.23	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		12/20/2001	6.08	2.81	6.08	2.81	<0.01	3.26	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		12/11/2001	6.2	2.93				3.13	9.33	6.06	12			-	Stick Up	Yes	RW - Inactive	
B-138		12/6/2001	6.27	3	6.21	2.94	0.06	3.11	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-138		11/8/2001	7.35	4.08	5.38	2.11	1.97	3.58	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/2/2001	7.44	4.17	5.37	2.1	2.07	3.57	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		11/1/2001	7.75	4.48	5.36	2.09	2.39	3.52	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/26/2001	7.33	4.06	5.18	1.91	2.15	3.74	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/25/2001	6.94	3.67	5.03	1.76	1.91	3.94	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/17/2001	7.05	3.78	4.96	1.69	2.09	3.98	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/11/2001	7.32	4.05	4.99	1.72	2.33	3.9	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		10/2/2001	6.91	3.64	4.87	1.6	2.04	4.08	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		9/19/2001	7.17	3.9	5	1.73	2.17	3.92	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		9/7/2001	7.06	3.79	4.88	1.61	2.18	4.04	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-138		9/5/2001	6.97	3.7	4.92	1.65	2.05	4.02	9.33	6.06	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-139		5/11/2017						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/6/2017						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/1/2016						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/12/2016						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/11/2016						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/8/2016						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/19/2015						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/3/2015	3.93	1.46				5.47	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/15/2015						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/13/2015	5.88	3.41	5.85	3.38	0.03	3.55	9.4	6.93	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		12/4/2014	5.39	2.92	5.38	2.91	0.01	4.02	9.4	6.93	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/11/2014	5.66	3.19	5.65	3.18	0.01	3.75	9.4	6.93	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		5/15/2014	5.77	3.3	5.63	3.16	0.14	3.75	9.4	6.93	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		1/23/2014	5.33	2.86	5.31	2.84	0.02	4.09	9.4	6.93	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/16/2013	5.57	3.1	5.51	3.04	0.06	3.88	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		7/12/2013	4.8	2.33				4.6	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/28/2013	6.04	3.57	6.04	3.57	<0.01	3.37	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-139		2/15/2013	5.51	3.04	5.34	2.87	0.17	4.03	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/10/2012	5.88	3.41	5.83	3.36	0.05	3.56	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		7/30/2012	5.79	3.32	5.79	3.32	<0.01	3.62	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		5/9/2012	6.06	3.59				3.34	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		1/30/2012	6.34	3.87	6.28	3.81	0.06	3.11	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/21/2011	6.07	3.6	6.07	3.6	<0.01	3.34	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/1/2011	6.19	3.72				3.21	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/18/2011	6	3.53	6	3.53	<0.01	3.41	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		2/23/2011	6.63	4.16	6.15	3.68	0.48	3.16	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/3/2010	6.61	4.14	5.96	3.49	0.65	3.32	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/25/2010	6.37	3.9	5.25	2.78	1.12	3.94	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/19/2010	5.89	3.42	5.55	3.08	0.34	3.79	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/13/2010	5.79	3.32	5.63	3.16	0.16	3.74	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		9/28/2010	6.16	3.69	6.14	3.67	0.02	3.26	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		7/29/2010			8.35		<0.01	NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/10/2010						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/22/2009	5.42	2.95	5.22	2.75	0.2	4.14	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		3/23/2009	7.11	4.64	6.37	3.9	0.74	2.89	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/25/2008	7.6	5.13				1.8	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/6/2008	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/15/2007	6.43	3.96	6.2	3.73	0.23	3.16	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		9/18/2007	9.85	7.38				-0.45	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/4/2007	8.15	5.68				1.25	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/2/2007	6.16	3.69	5.84	3.37	0.32	3.5	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/7/2006						NA	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/29/2006	5.37	2.9				4.03	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/24/2006	9.65	7.18				-0.25	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/8/2006			5.65		3	4.45	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-139		7/1/2005						3.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/19/2005	6.9	4.43				2.5	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/20/2005	8.66	6.19	5.52	3.05	3.14	3.29	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		3/9/2005	7.84	5.37	5.62	3.15	2.22	3.36	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		1/12/2005	7.52	5.05	7.44	4.97	0.08	1.94	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		12/3/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/24/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/16/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/12/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/5/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/22/2004	6.08	3.61	5.76	3.29	0.32	3.58	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/8/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/24/2004	6	3.53				3.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/17/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/10/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/2/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/24/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/11/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/4/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/27/2004	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/21/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/14/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/9/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/28/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/10/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/28/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/18/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/12/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/7/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/29/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/22/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/15/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/6/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/2/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/25/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/17/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/11/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/3/2004	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/17/2004	7.45	4.98	7.21	4.74	0.24	2.14	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		2/10/2004	8.6	6.13				0.8	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/3/2004	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		1/6/2004	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/30/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/22/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/8/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/2/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/24/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/19/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		11/11/2003	6.5	4.03				2.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-139		11/5/2003	5.9	3.43	5.9	3.43	<0.01	3.51	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/22/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/13/2003	5.6	3.13	5.6	3.13	<0.01	3.81	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/7/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/1/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/24/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/8/2003	6.4	3.93	6.4	3.93	<0.01	3.01	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		9/3/2003	6.4	3.93	6.4	3.93	<0.01	3.01	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/27/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/20/2003	6.7	4.23	6.7	4.23	<0.01	2.71	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/12/2003	6.9	4.43	6.9	4.43	<0.01	2.51	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/6/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/24/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/18/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/30/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/26/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/17/2003	6.37	3.9	5.73	3.26	0.64	3.55	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		6/13/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/2/2003	6.7	4.23				2.7	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/30/2003	7	4.53				2.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/20/2003	6.9	4.43	6	3.53	0.9	3.23	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		5/8/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/28/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/25/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/9/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/2/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/26/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/21/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/12/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/25/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/21/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/13/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/6/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		1/21/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		1/10/2003	8.1	5.63				1.3	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/30/2002	7.6	5.13	7.6	5.13	<0.01	1.81	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		12/27/2002	9.04	6.57	5.63	3.16	3.41	3.13	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		12/19/2002	7.1	4.63	4.29	1.82	2.81	4.58	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-139		12/4/2002	9.56	7.09	6.25	3.78	3.31	2.53	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/26/2002	7.61	5.14	4.6	2.13	3.01	4.23	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/19/2002	7.9	5.43	4.88	2.41	3.02	3.95	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/5/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/31/2002	7.4	4.93				2	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/22/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/18/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/10/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		10/4/2002	7.6	5.13				1.8	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/23/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/20/2002	7.5	5.03				1.9	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		9/4/2002	7.45	4.98	7.45	4.98	<0.01	1.96	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/27/2002	7.55	5.08	7.55	5.08	<0.01	1.86	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		8/12/2002	7.75	5.28				1.65	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		8/9/2002	7.75	5.28				1.65	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/31/2002	7.75	5.28				1.65	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/22/2002	7.75	5.28				1.65	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/16/2002	7.75	5.28				1.65	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/12/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		7/1/2002	8.25	5.78				1.15	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/27/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/19/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/14/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		6/7/2002	6.4	3.93	6.05	3.58	0.35	3.28	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		5/31/2002	7.35	4.88	6.39	3.92	0.96	2.83	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		5/21/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/15/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		5/1/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/24/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/19/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/12/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		4/2/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/26/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/19/2002	9.13	6.66	6.55	4.08	2.58	2.36	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		3/11/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/5/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		3/1/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/19/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/11/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		2/7/2002	8	5.53				1.4	9.4	6.93	12			-	Stick Up	Yes	RW - Inact	Damaged
B-139		12/11/2001	11.06	8.59	5.72	3.25	5.34	2.67	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-139		11/8/2001	10.28	7.81	5.7	3.23	4.58	2.84	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/2/2001	8.83	6.36	6.01	3.54	2.82	2.86	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		11/1/2001	10.76	8.29	5.78	3.31	4.98	2.68	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/26/2001	9.36	6.89	5.72	3.25	3.64	2.99	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/25/2001	10.56	8.09	5.39	2.92	5.17	3.03	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/17/2001	10.85	8.38	5.46	2.99	5.39	2.92	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/11/2001	10.92	8.45	5.43	2.96	5.49	2.93	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		10/2/2001	11.05	8.58	5.43	2.96	5.62	2.91	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		9/19/2001	11.15	8.68	5.8	3.33	5.35	2.59	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		9/7/2001	11.11	8.64	5.81	3.34	5.3	2.59	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-139		9/5/2001	11.35	8.88	5.77	3.3	5.58	2.58	9.4	6.93	12	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inact	Damaged
B-140		5/11/2017						NA	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/8/2016						NA	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/12/2013						NA	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/9/2012						NA	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/18/2011	2.8	0.05				7.34	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/28/2010	3.5	0.75				6.64	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/29/2010			2.63		<0.01	NA	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/22/2009	2	-0.75				8.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/23/2009	4.23	1.48				5.91	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/25/2008	5.82	3.07				4.32	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/6/2008	4.95	2.2				5.19	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/15/2007	5.61	2.86	5.56	2.81	0.05	4.57	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/18/2007	6.56	3.81	6.43	3.68	0.13	3.69	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/4/2007	5.82	3.07	5.69	2.94	0.13	4.43	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-140		3/2/2007	5.17	2.42	5.15	2.4	0.02	4.99	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/7/2006			5.34		0.19	NA	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/29/2006	5.36	2.61	5.22	2.47	0.14	4.9	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/24/2006	6.06	3.31	5.8	3.05	0.26	4.31	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/8/2006			5.29		0.18	5.87	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/1/2005			6.12		0.41	5	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/19/2005	6.23	3.48	5.91	3.16	0.32	4.19	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/20/2005	5.34	2.59	5.18	2.43	0.16	4.94	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/9/2005	5.26	2.51	5.19	2.44	0.07	4.94	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		1/12/2005	5.07	2.32	5.05	2.3	0.02	5.09	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/3/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/24/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/16/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/12/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/5/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/22/2004	5.14	2.39	5.14	2.39	<0.01	5.01	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/8/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/24/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/17/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/10/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/2/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/24/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/11/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/4/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/27/2004	6	3.25				4.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/21/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/14/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/9/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-140		6/28/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/10/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/28/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/18/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/12/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/7/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/29/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/22/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/15/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/6/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/2/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/25/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/17/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/11/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/3/2004	8.3	5.55				1.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/17/2004	8	5.25				2.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/10/2004	6.1	3.35				4.04	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/3/2004	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		1/6/2004	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/30/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/22/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/8/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/2/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/24/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/19/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/11/2003	6.4	3.65				3.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/5/2003	5.48	2.73				4.66	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/22/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/13/2003	6.4	3.65	6.4	3.65	<0.01	3.75	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/7/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/1/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/24/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/8/2003	6.5	3.75	6.5	3.75	<0.01	3.65	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/3/2003	6.5	3.75	6.5	3.75	<0.01	3.65	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/27/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/20/2003	6.6	3.85	6.6	3.85	<0.01	3.55	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/12/2003	6.8	4.05	6.8	4.05	<0.01	3.35	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/6/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/24/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/18/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-140		6/30/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/26/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/17/2003	5.35	2.6	5.09	2.34	0.26	5.02	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/13/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/2/2003	6.6	3.85				3.54	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/30/2003	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/20/2003	6.11	3.36	6.1	3.35	0.01	4.04	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/8/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/28/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/25/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/9/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/2/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/26/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/21/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/12/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/25/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/21/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/13/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/6/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		1/21/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		1/10/2003	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/30/2002	6.7	3.95	6.7	3.95	<0.01	3.45	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/27/2002	6.7	3.95	6.7	3.95	<0.01	3.45	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/19/2002	5.14	2.39	5.03	2.28	0.11	5.1	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/4/2002	5.56	2.81	5.56	2.81	<0.01	4.59	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/26/2002	4.47	1.72	4.47	1.72	<0.01	5.68	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/19/2002	4.6	1.85	4.6	1.85	<0.01	5.55	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/5/2002	7.5	4.75				2.64	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-140		10/31/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/22/2002	7.5	4.75				2.64	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/18/2002	7.5	4.75				2.64	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/10/2002	7.5	4.75				2.64	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/4/2002	7.4	4.65				2.74	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/23/2002	7.5	4.75				2.64	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/20/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/4/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/27/2002	7.27	4.52	7.25	4.5	0.02	2.89	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/12/2002	7.3	4.55				2.84	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		8/9/2002	7.1	4.35				3.04	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/31/2002	7.1	4.35				3.04	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/22/2002	7.1	4.35				3.04	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/16/2002	7.1	4.35				3.04	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/12/2002	8	5.25				2.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		7/1/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/27/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/19/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/14/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		6/7/2002	6.28	3.53	5.88	3.13	0.4	4.21	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/31/2002	6.62	3.87	6.31	3.56	0.31	3.79	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/21/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/15/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		5/1/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/24/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/19/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/12/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		4/2/2002	7	4.25				3.14	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/26/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/19/2002	6.56	3.81	6.19	3.44	0.37	3.9	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/11/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/5/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		3/1/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/19/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/11/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		2/7/2002	7.2	4.45				2.94	10.14	7.39	12			-	Stick Up	Yes	RW - Inact	Destroyed
B-140		12/11/2001	8.55	5.8	6.29	3.54	2.26	3.55	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-140		11/8/2001	9.04	6.29	6.29	3.54	2.75	3.48	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/2/2001	9.27	6.52	6.26	3.51	3.01	3.47	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		11/1/2001	9.65	6.9	6.28	3.53	3.37	3.41	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/26/2001	9.11	6.36	6.03	3.28	3.08	3.7	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/25/2001	8.82	6.07	5.95	3.2	2.87	3.8	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/17/2001	8.9	6.15	5.92	3.17	2.98	3.82	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/11/2001	9.15	6.4	5.97	3.22	3.18	3.74	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		10/2/2001	8.93	6.18	5.77	3.02	3.16	3.94	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/19/2001	14.85	12.1	6	3.25	8.85	2.95	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/7/2001	10.38	7.63	5.98	3.23	4.4	3.57	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-140		9/5/2001	10.85	8.1	5.89	3.14	4.96	3.58	10.14	7.39	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inact	Destroyed
B-141		5/11/2017	2.69	1.75				6	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		12/1/2016	2.82	1.88				5.87	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		5/11/2016	3.04	2.1				5.65	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		11/19/2015	3.77	2.83				4.92	8.69	7.75	12			-	Stick Up		MW	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-141		5/15/2015	4.09	3.15				4.6	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		2/13/2015	3.4	2.46				5.29	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		12/4/2014	3.23	2.29				5.46	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		5/14/2014	3.74	2.8				4.95	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		10/16/2013	4.03	3.09				4.66	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		7/12/2013	3.95	3.01				4.74	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		3/28/2013	2.96	2.02	2.95	2.01	0.01	5.74	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		5/9/2012	3.41	2.47				5.28	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		5/18/2011	3.22	2.28				5.47	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		10/25/2010	3.03	2.09				5.66	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		10/19/2010	2.89	1.95				5.8	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		10/13/2010	3.1	2.16				5.59	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		9/28/2010	3.3	2.36	3.1	2.16	0.2	5.56	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		7/29/2010			2.12		0.21	NA	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		6/22/2009	2.84	1.9	2.84	1.9	<0.01	5.86	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		3/23/2009	4.59	3.65	4.26	3.32	0.33	4.39	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/25/2008	3.83	2.89	3.63	2.69	0.2	5.03	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		8/18/2008	3.73	2.79	3.51	2.57	0.22	5.15	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		6/6/2008	3.56	2.62	2.89	1.95	0.67	5.71	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		3/31/2008	3.39	2.45	2.77	1.83	0.62	5.84	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/15/2007	4.15	3.21	3.5	2.56	0.65	5.1	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-141		9/18/2007	4.9	3.96	4.21	3.27	0.69	4.39	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		6/4/2007	4.14	3.2	3.48	2.54	0.66	5.12	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		3/2/2007	3.97	3.03	3.3	2.36	0.67	5.3	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/7/2006			3.2		0.7	NA	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		8/29/2006	3.7	2.76	3.09	2.15	0.61	5.52	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		5/24/2006	4.43	3.49	3.68	2.74	0.75	4.91	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		2/8/2006			3.21		0.72	9.12	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		7/1/2005			3.89		0.61	7.7	8.69	7.75	12			-	Stick Up		MW	Damaged
B-141		5/19/2005	4.31	3.37	3.62	2.68	0.69	4.98	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		3/9/2005	3.65	2.71	3	2.06	0.65	5.6	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/8/2004	3.85	2.91	3.15	2.21	0.7	5.45	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		9/17/2004	4.51	3.57	3.86	2.92	0.65	4.74	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		6/28/2004	4.46	3.52	3.88	2.94	0.58	4.73	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		3/11/2004	3.89	2.95	3.34	2.4	0.55	5.28	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-141		11/24/2003	5.43	4.49	5.1	4.16	0.33	3.55	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		8/20/2003	6.08	5.14	5.52	4.58	0.56	3.09	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		5/20/2003	6.03	5.09	5.57	4.63	0.46	3.06	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		4/28/2003	5.63	4.69	5.25	4.31	0.38	3.39	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		4/25/2003	5.8	4.86	5.22	4.28	0.58	3.39	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		3/21/2003	5.09	4.15	4.67	3.73	0.42	3.96	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/21/2002	5.39	4.45	4.66	3.72	0.73	3.93	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/20/2002	6.2	5.26	4.54	3.6	1.66	3.93	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/31/2002	6.51	5.57	5.05	4.11	1.46	3.44	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		9/23/2002	7.65	6.71	5.75	4.81	1.9	2.68	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		8/12/2002	7.46	6.52	5.98	5.04	1.48	2.51	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-141		6/14/2002	6.64	5.7	4.95	4.01	1.69	3.51	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		2/19/2002	7.24	6.3	5.92	4.98	1.32	2.59	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		12/11/2001	7.05	6.11	6.07	5.13	0.98	2.49	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/8/2001	6.9	5.96	6.15	5.21	0.75	2.44	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/2/2001	6.56	5.62	6.16	5.22	0.4	2.48	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		11/1/2001	7.52	6.58	6.06	5.12	1.46	2.43	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/26/2001	6.89	5.95	5.98	5.04	0.91	2.59	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/25/2001	8.04	7.1	5.66	4.72	2.38	2.71	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/17/2001	8.15	7.21	5.57	4.63	2.58	2.77	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/11/2001	8.27	7.33	5.59	4.65	2.68	2.74	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		10/2/2001	8.27	7.33	5.4	4.46	2.87	2.9	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-141		9/19/2001	9.28	8.34	5.54	4.6	3.74	2.65	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		9/7/2001	8.35	7.41	5.7	4.76	2.65	2.63	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-141		9/5/2001	8.9	7.96	5.61	4.67	3.29	2.64	8.69	7.75	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up		MW	Damaged
B-142		5/11/2017	7.58	4.65	6.91	3.98	0.67	2.73982	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		3/6/2017	8.36	5.43	7.43	4.5	0.93	2.18482	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		12/1/2016	7.76	4.83	6.85	3.92	0.91	2.76751	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		8/12/2016	7.95	5.02	7	4.07	0.95	2.61213	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		5/11/2016	7.75	4.82	6.76	3.83	0.99	2.85	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		2/8/2016	7.6	4.67	6.62	3.69	0.98	2.99	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		11/19/2015	7.84	4.91	7.01	4.08	0.83	2.62	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		8/3/2015	7.53	4.6	6.75	3.82	0.78	2.89	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		5/15/2015	7.76	4.83	7.28	4.35	0.48	2.4	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		2/13/2015	7.53	4.6	7.25	4.32	0.28	2.45	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		12/4/2014	7.24	4.31	7.19	4.26	0.05	2.54	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		8/11/2014	7.12	4.19	7.12	4.19	<0.01	2.63	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		5/15/2014	7.7	4.77	6.92	3.99	0.78	2.72	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		1/23/2014	7.3	4.37	7.3	4.37	<0.01	2.45	9.74	6.81	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-142		10/16/2013	7.18	4.25	7.18	4.25	<0.01	2.57	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		7/12/2013	7.41	4.48	6.32	3.39	1.09	3.27	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		3/28/2013	7.04	4.11				2.7	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/15/2013	6.73	3.8				3.01	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/10/2012	7.29	4.36				2.45	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		7/30/2012	7.09	4.16	7.08	4.15	0.01	2.66	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		5/9/2012	7.19	4.26	7.18	4.25	0.01	2.56	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		1/30/2012	7.33	4.4	7.2	4.27	0.13	2.52	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/21/2011	8.23	5.3	7.08	4.15	1.15	2.51	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		8/1/2011	7.13	4.2	7.13	4.2	<0.01	2.62	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		5/18/2011	7.43	4.5	7.43	4.5	<0.01	2.32	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		2/23/2011	7.67	4.74	7.34	4.41	0.33	2.36	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/3/2010	7.04	4.11	7.04	4.11	<0.01	2.71	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/25/2010	6.26	3.33	6.26	3.33	<0.01	3.49	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/19/2010	6.94	4.01	6.58	3.65	0.36	3.11	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/13/2010	6.75	3.82	6.57	3.64	0.18	3.15	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		9/28/2010	7.31	4.38	7.3	4.37	0.01	2.44	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		7/29/2010			9.98		<0.01	NA	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/10/2010						NA	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/22/2009	7.09	4.16	6.7	3.77	0.39	2.99	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		3/23/2009	7.66	4.73	7.57	4.64	0.09	2.16	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/25/2008	10.1	7.17				-0.36	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/6/2008	9.88	6.95				-0.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/15/2007	7.08	4.15	7.08	4.15	<0.01	2.67	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/18/2007	10.8	7.87				-1.06	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/4/2007	8.05	5.12	7.14	4.21	0.91	2.48	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		3/2/2007	6.92	3.99	6.9	3.97	0.02	2.84	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/7/2006						NA	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/29/2006	8.5	5.57	8.5	5.57	<0.01	1.25	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		5/24/2006	8.9	5.97				0.84	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/8/2006			6.75		1.02	3.84	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/1/2005						3.73	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/19/2005	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/20/2005	5.87	2.94	4.65	1.72	1.22	4.93	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		3/9/2005	7.48	4.55	6.7	3.77	0.78	2.94	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		1/12/2005	7.31	4.38	6.59	3.66	0.72	3.05	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		12/3/2004	7.5	4.57				2.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/24/2004	7.5	4.57				2.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/16/2004	7.5	4.57				2.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/12/2004	7.5	4.57				2.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/5/2004	7.5	4.57				2.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/22/2004	7.09	4.16	6.11	3.18	0.98	3.5	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/8/2004	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/24/2004	5	2.07				4.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/17/2004	6	3.07				3.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/10/2004	6	3.07				3.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/2/2004	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/24/2004	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/11/2004	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/4/2004	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/27/2004	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/21/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/14/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/9/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/28/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/10/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/28/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/18/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/12/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/7/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/29/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/22/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/15/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/6/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/2/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/25/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/17/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/11/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/3/2004	7.4	4.47				2.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/17/2004	8.2	5.27				1.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/10/2004	8.2	5.27				1.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/3/2004	7.95	5.02	7.95	5.02	<0.01	1.8	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		1/6/2004	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/30/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/22/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/8/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/2/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/24/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/19/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/11/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		11/5/2003	7.17	4.24	6.44	3.51	0.73	3.2	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		10/22/2003	7.26	4.33	6.89	3.96	0.37	2.8	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/13/2003	7.93	5	7.77	4.84	0.16	1.95	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/7/2003	7.7	4.77	7.15	4.22	0.55	2.52	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/1/2003	7.61	4.68	7.59	4.66	0.02	2.15	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/24/2003	7.31	4.38	7.3	4.37	0.01	2.44	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/8/2003	8	5.07	8	5.07	<0.01	1.75	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/3/2003	8	5.07	8	5.07	<0.01	1.75	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		8/27/2003	8.9	5.97				0.84	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/20/2003	8.5	5.57	8.5	5.57	<0.01	1.25	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		8/12/2003	8.52	5.59	8.38	5.45	0.14	1.34	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		8/6/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/24/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/18/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/30/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/26/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/17/2003	7.72	4.79	7.72	4.79	<0.01	2.03	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		6/13/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/2/2003	8.4	5.47				1.34	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/30/2003	8	5.07				1.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/20/2003	7.06	4.13				2.68	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		5/8/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/28/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/25/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/9/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/2/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/26/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/21/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/12/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/25/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/21/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/13/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/6/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		1/21/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		1/10/2003	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/30/2002	9.2	6.27	9.2	6.27	<0.01	0.55	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		12/27/2002	9.2	6.27	9.2	6.27	<0.01	0.55	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		12/19/2002	9.5	6.57				0.24	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/4/2002	8.42	5.49	6.49	3.56	1.93	2.99	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/26/2002	6.25	3.32	5.99	3.06	0.26	3.72	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/19/2002	6.38	3.45	6.12	3.19	0.26	3.59	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/5/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/31/2002	9.12	6.19				0.62	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/22/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/18/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/10/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		10/4/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/23/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/20/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		9/4/2002	9.15	6.22	9.15	6.22	<0.01	0.6	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		8/27/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/12/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		8/9/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/31/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/22/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/16/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		7/12/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		7/1/2002	9.2	6.27				0.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/27/2002	9.6	6.67	7.6	4.67	2	1.87	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		6/19/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/14/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		6/7/2002	8.65	5.72	7.34	4.41	1.31	2.22	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		5/31/2002	8.4	5.47	7.25	4.32	1.15	2.34	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		5/21/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/15/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		5/1/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/24/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/19/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/12/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		4/2/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/26/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/19/2002	8.58	5.65	7.53	4.6	1.05	2.07	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		3/11/2002	7.6	4.67				2.14	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/5/2002	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		3/1/2002	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/19/2002	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/11/2002	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		2/7/2002	7	4.07				2.74	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		1/21/2002	7.2	4.27				2.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		1/15/2002	7.2	4.27				2.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		1/4/2002	7.2	4.27				2.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/27/2001	7.14	4.21	7.1	4.17	0.04	2.63	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		12/20/2001	7.22	4.29	7.22	4.29	<0.01	2.53	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		12/11/2001	7.2	4.27				2.54	9.74	6.81	12			-	Stick Up	Yes	RW - Inactive	
B-142		12/6/2001	7.36	4.43	7.36	4.43	<0.01	2.39	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-142		11/8/2001	9.87	6.94	6.89	3.96	2.98	2.45	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/2/2001	9.76	6.83	6.94	4.01	2.82	2.42	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		11/1/2001	10.27	7.34	6.93	4	3.34	2.36	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/26/2001	9.47	6.54	6.83	3.9	2.64	2.55	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/25/2001	9.65	6.72	6.67	3.74	2.98	2.67	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/17/2001	9.88	6.95	6.74	3.81	3.14	2.58	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/11/2001	9.74	6.81	5.7	2.77	4.04	3.5	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		10/2/2001	9.72	6.79	6.7	3.77	3.02	2.63	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/19/2001	9.71	6.78	6.8	3.87	2.91	2.55	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/7/2001	9.71	6.78	6.72	3.79	2.99	2.62	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-142		9/5/2001	9.8	6.87	6.72	3.79	3.08	2.61	9.74	6.81	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/11/2017	5.64	3.02	4.96	2.34	0.68	3.92847	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		3/6/2017	6.63	4.01	5.92	3.3	0.71	2.96443	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		12/1/2016	5.5	2.88	4.63	2.01	0.87	4.2329	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		8/12/2016	6.07	3.45	5.21	2.59	0.86	3.65424	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		5/11/2016	5.54	2.92	4.72	2.1	0.82	4.15	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		2/8/2016	5.09	2.47	4.41	1.79	0.68	4.48	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		11/19/2015	6.23	3.61	5.46	2.84	0.77	3.42	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		8/3/2015	5.42	2.8	4.81	2.19	0.61	4.09	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		5/15/2015	6.31	3.69	5.79	3.17	0.52	3.12	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		2/13/2015	5.98	3.36	5.43	2.81	0.55	3.48	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		12/4/2014	5.5	2.88	4.88	2.26	0.62	4.02	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		8/11/2014	5.34	2.72	5.34	2.72	<0.01	3.65	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		5/15/2014	5.33	2.71	5.23	2.61	0.1	3.74	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		1/23/2014	5.62	3	5.61	2.99	0.01	3.37	8.98	6.36	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-143		10/16/2013	5.41	2.79	5.41	2.79	<0.01	3.58	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		7/12/2013	5.09	2.47	4.36	1.74	0.73	4.52	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		3/28/2013	5.41	2.79	5.41	2.79	<0.01	3.58	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		2/15/2013	4.95	2.33				4.03	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/10/2012	6.01	3.39	6.01	3.39	<0.01	2.98	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		7/30/2012	7.24	4.62	5.6	2.98	1.64	3.16	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/9/2012	6.11	3.49	5.7	3.08	0.41	3.22	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		1/30/2012	5.34	2.72	5.33	2.71	0.01	3.65	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/21/2011	5.63	3.01	5.48	2.86	0.15	3.48	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		8/1/2011	6.84	4.22	6.15	3.53	0.69	2.74	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/18/2011	6.01	3.39	5.9	3.28	0.11	3.07	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		2/23/2011	5.69	3.07	5.69	3.07	<0.01	3.3	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/3/2010	6.03	3.41	5.48	2.86	0.55	3.43	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/25/2010	5.48	2.86	5.11	2.49	0.37	3.82	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/19/2010	5.2	2.58	4.94	2.32	0.26	4.01	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/13/2010	5.18	2.56	4.17	1.55	1.01	4.67	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		9/28/2010	6.1	3.48	5.88	3.26	0.22	3.07	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		7/29/2010						NA	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/10/2010						NA	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/22/2009	5.65	3.03	4.83	2.21	0.82	4.04	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		3/23/2009	7.55	4.93	6.09	3.47	1.46	2.69	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/25/2008	7.35	4.73	6.12	3.5	1.23	2.69	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		6/6/2008	7.02	4.4	5.56	2.94	1.46	3.22	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/15/2007	6.88	4.26	5.54	2.92	1.34	3.26	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		9/18/2007	7.85	5.23	6.82	4.2	1.03	2.02	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		6/4/2007	6.18	3.56	5.8	3.18	0.38	3.13	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		3/2/2007	6.04	3.42	5.39	2.77	0.65	3.5	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/7/2006						NA	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/29/2006	8.7	6.08	8.7	6.08	<0.01	0.29	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/24/2006	9.3	6.68				-0.32	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/8/2006			5.09		0.27	4.91	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/1/2005						3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/19/2005	6.3	3.68				2.68	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/20/2005	8.72	6.1	6.31	3.69	2.41	2.35	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		3/9/2005	5.84	3.22	4.93	2.31	0.91	3.93	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		1/12/2005	5.98	3.36	4.53	1.91	1.45	4.25	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		12/3/2004	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		11/24/2004	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		11/16/2004	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		11/12/2004	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/22/2004	4.71	2.09	4.71	2.09	<0.01	4.28	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/8/2004	5.5	2.88				3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/24/2004	5	2.38				3.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/17/2004	5	2.38				3.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/10/2004	5	2.38				3.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/2/2004	5.5	2.88				3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/24/2004	5.5	2.88				3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/11/2004	5.5	2.88				3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/4/2004	5.5	2.88				3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/27/2004	5.5	2.88				3.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/21/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/14/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/9/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/28/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/10/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/28/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/18/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/12/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/7/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/29/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/22/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/15/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/6/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/2/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/25/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/17/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/11/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/3/2004	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/17/2004	6.3	3.68				2.68	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/10/2004	6.12	3.5	5.66	3.04	0.46	3.26	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		2/3/2004	6.68	4.06	6.65	4.03	0.03	2.33	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		1/6/2004	6	3.38				2.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/30/2003	6	3.38				2.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/22/2003	6	3.38				2.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/8/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		12/2/2003	6.61	3.99	5.85	3.23	0.76	3.03	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/24/2003	7.11	4.49	6.27	3.65	0.84	2.6	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/19/2003	6.99	4.37	6.46	3.84	0.53	2.45	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/11/2003	6.92	4.3	6.3	3.68	0.62	2.6	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/5/2003	5.16	2.54	5	2.38	0.16	3.96	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/22/2003	5.79	3.17	5.78	3.16	0.01	3.2	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/13/2003	5.97	3.35	5.78	3.16	0.19	3.17	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/7/2003	6.19	3.57	6.17	3.55	0.02	2.81	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/1/2003	5.7	3.08	5.66	3.04	0.04	3.31	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		9/24/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/3/2003	7.1	4.48	7.1	4.48	<0.01	1.89	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		8/27/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/20/2003	7.1	4.48	7.1	4.48	<0.01	1.89	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		8/12/2003	7.6	4.98	7.6	4.98	<0.01	1.39	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		8/6/2003	8	5.38				0.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/24/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/18/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/30/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/26/2003	6.7	4.08	6.5	3.88	0.2	2.45	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		6/17/2003	6.8	4.18	6.8	4.18	<0.01	2.19	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		6/13/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/2/2003	6.6	3.98				2.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/30/2003	7	4.38				1.98	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/20/2003	5.94	3.32	5.94	3.32	<0.01	3.05	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/8/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/28/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/25/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/9/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/2/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/26/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/21/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/12/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/25/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/21/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/13/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/6/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		1/21/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		1/10/2003	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/30/2002	7.6	4.98	7.6	4.98	<0.01	1.39	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		12/27/2002	7.6	4.98	7.6	4.98	<0.01	1.39	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		12/19/2002	7.5	4.88				1.48	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/4/2002	5.41	2.79	5.34	2.72	0.07	3.63	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		11/26/2002	4.43	1.81	4.41	1.79	0.02	4.57	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/19/2002	4.53	1.91	4.51	1.89	0.02	4.47	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/5/2002	7.7	5.08				1.28	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/31/2002	7.35	4.73				1.63	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/22/2002	7.7	5.08				1.28	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/18/2002	7.7	5.08				1.28	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/10/2002	7.7	5.08				1.28	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		10/4/2002	7.6	4.98				1.38	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/23/2002	7.7	5.08				1.28	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/20/2002	7.7	5.08				1.28	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		9/4/2002	7.55	4.93				1.43	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/27/2002	7.65	5.03				1.33	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/12/2002	8.4	5.78				0.58	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		8/9/2002	7.8	5.18				1.18	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/31/2002	7.8	5.18				1.18	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/22/2002	7.8	5.18				1.18	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/16/2002	7.8	5.18				1.18	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		7/12/2002	7.4	4.78	6.83	4.21	0.57	2.07	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		7/1/2002	7.8	5.18				1.18	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/27/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/19/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/14/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		6/7/2002	5.74	3.12	5.73	3.11	0.01	3.25	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/31/2002	6.11	3.49	6.11	3.49	<0.01	2.88	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		5/21/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/15/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		5/1/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/24/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/19/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/12/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		4/2/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/26/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/19/2002	7.2	4.58	6.72	4.1	0.48	2.2	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		3/11/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/5/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		3/1/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		2/19/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/11/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		2/7/2002	7.1	4.48				1.88	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		1/21/2002	7.2	4.58				1.78	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		1/15/2002	7.2	4.58				1.78	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		1/4/2002	7.2	4.58				1.78	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/27/2001	6	3.38	5.98	3.36	0.02	3	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		12/20/2001	7.68	5.06	7.68	5.06	<0.01	1.31	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		12/11/2001	7.2	4.58				1.78	8.98	6.36	12			-	Stick Up	Yes	RW - Inactive	
B-143		12/6/2001	7.44	4.82	7.44	4.82	<0.01	1.55	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/8/2001	8.65	6.03	5.91	3.29	2.74	2.7	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/2/2001	7.72	5.1	6.06	3.44	1.66	2.7	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		11/1/2001	12.42	9.8	6.94	4.32	5.48	1.3	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/26/2001	7.78	5.16	5.91	3.29	1.87	2.82	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/25/2001	8.65	6.03	5.61	2.99	3.04	2.96	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/17/2001	8.55	5.93	5.73	3.11	2.82	2.87	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		10/11/2001	9.1	6.48	5.7	3.08	3.4	2.82	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-143		10/2/2001	8.79	6.17	5.62	3	3.17	2.93	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		9/19/2001	8.68	6.06	5.73	3.11	2.95	2.85	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		9/7/2001	7.8	5.18	5.72	3.1	2.08	2.98	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-143		9/5/2001	8.21	5.59	5.67	3.05	2.54	2.97	8.98	6.36	12	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE	Stick Up	Yes	RW - Inactive	
B-144		5/11/2017	4.86	2	4.85	1.99	0.01	4.16865	9.02	6.16	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up		MW	
B-144		12/1/2016	5.06	2.2				3.96	9.02	6.16	12			-	Stick Up		MW	
B-144		5/11/2016	4.7	1.84	4.69	1.83	0.01	4.33	9.02	6.16	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up		MW	
B-144		5/11/2016	4.73	1.87				4.29	9.02	6.16	12			-	Stick Up		MW	
B-144		11/19/2015	5.2	2.34	5.2	2.34	<0.01	3.83	9.02	6.16	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up		MW	
B-144		5/15/2015	5.55	2.69	5.54	2.68	0.01	3.48	9.02	6.16	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up		MW	
B-144		2/13/2015	5.19	2.33	5.05	2.19	0.14	3.95	9.02	6.16	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up		MW	
B-144		12/4/2014	4.86	2	4.85	1.99	0.01	4.17	9.02	6.16	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up		MW	
B-144		5/15/2014	4.81	1.95				4.21	9.02	6.16	12			-	Stick Up		MW	
B-144		10/16/2013	4.85	1.99				4.17	9.02	6.16	12			-	Stick Up		MW	
B-144		7/12/2013	4.84	1.98	4.75	1.89	0.09	4.26	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		3/28/2013	4.63	1.77	4.61	1.75	0.02	4.41	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		5/9/2012	4.85	1.99				4.17	9.02	6.16	12			-	Stick Up		MW	
B-144		5/18/2011	4.89	2.03	4.88	2.02	0.01	4.14	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		10/25/2010	4.47	1.61				4.55	9.02	6.16	12			-	Stick Up		MW	
B-144		10/19/2010	4.33	1.47				4.69	9.02	6.16	12			-	Stick Up		MW	
B-144		10/13/2010	4.37	1.51				4.65	9.02	6.16	12			-	Stick Up		MW	
B-144		9/28/2010	5.31	2.45	5.27	2.41	0.04	3.74	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		7/29/2010			4.53		0.14	NA	9.02	6.16	12			-	Stick Up		MW	
B-144		6/22/2009	4.45	1.59	4.21	1.35	0.24	4.78	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		3/23/2009	5.81	2.95	5.42	2.56	0.39	3.55	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		11/25/2008	5.53	2.67	5.35	2.49	0.18	3.65	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		8/18/2008	5.32	2.46	5.04	2.18	0.28	3.94	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		6/6/2008	4.76	1.9	4.58	1.72	0.18	4.42	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-144		3/31/2008	4.86	2	4.75	1.89	0.11	4.26	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		11/15/2007	4.98	2.12	4.9	2.04	0.08	4.11	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		9/18/2007	5.94	3.08	5.75	2.89	0.19	3.24	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		6/4/2007	5.15	2.29	5.09	2.23	0.06	3.92	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		3/2/2007	4.85	1.99	4.73	1.87	0.12	4.27	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		11/7/2006			4.52		0.29	NA	9.02	6.16	12			-	Stick Up		MW	
B-144		8/29/2006	4.93	2.07	4.8	1.94	0.13	4.2	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		5/24/2006	5.45	2.59	5.33	2.47	0.12	3.67	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		2/8/2006			4.35		0.57	5.52	9.02	6.16	12			-	Stick Up		MW	
B-144		7/1/2005			5.17		0.47	4.72	9.02	6.16	12			-	Stick Up		MW	
B-144		5/19/2005	5.59	2.73	5.06	2.2	0.53	3.89	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		3/9/2005	5	2.14	4.22	1.36	0.78	4.7	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		10/8/2004	4.94	2.08	4	1.14	0.94	4.89	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		9/17/2004	5.54	2.68	5.03	2.17	0.51	3.92	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		6/28/2004	5.87	3.01	5.41	2.55	0.46	3.55	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		3/11/2004	5.55	2.69	4.96	2.1	0.59	3.98	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		11/24/2003	5.84	2.98	5.39	2.53	0.45	3.57	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		8/20/2003	5.99	3.13	5.51	2.65	0.48	3.45	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		5/20/2003	5.65	2.79	5.21	2.35	0.44	3.75	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		3/21/2003	4.45	1.59	3.92	1.06	0.53	5.03	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		10/31/2002	5.71	2.85	5.46	2.6	0.25	3.53	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		9/23/2002	6.31	3.45	5.75	2.89	0.56	3.19	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		8/12/2002	6.05	3.19	6.04	3.18	0.01	2.98	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		6/14/2002	5.38	2.52	4.87	2.01	0.51	4.08	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		2/19/2002	6.21	3.35	5.81	2.95	0.4	3.16	9.02	6.16	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-144		12/11/2001	6.03	3.17				2.99	9.02	6.16	12			-	Stick Up		MW	
B-144		11/8/2001	5.79	2.93				3.23	9.02	6.16	12			-	Stick Up		MW	
B-144		11/2/2001	5.82	2.96				3.2	9.02	6.16	12			-	Stick Up		MW	
B-144		11/1/2001	5.9	3.04				3.12	9.02	6.16	12			-	Stick Up		MW	
B-144		10/26/2001	5.64	2.78				3.38	9.02	6.16	12			-	Stick Up		MW	
B-144		10/25/2001	5.43	2.57				3.59	9.02	6.16	12			-	Stick Up		MW	
B-144		10/17/2001	5.5	2.64				3.52	9.02	6.16	12			-	Stick Up		MW	
B-144		10/11/2001	5.6	2.74				3.42	9.02	6.16	12			-	Stick Up		MW	
B-144		10/2/2001	5.44	2.58				3.58	9.02	6.16	12			-	Stick Up		MW	
B-144		9/19/2001	5.55	2.69				3.47	9.02	6.16	12			-	Stick Up		MW	
B-144		9/7/2001	5.38	2.52				3.64	9.02	6.16	12			-	Stick Up		MW	
B-144		9/5/2001	5.39	2.53				3.63	9.02	6.16	12			-	Stick Up		MW	
B-145		5/11/2017	4.63	1.98				5.18	9.81	7.16	12			-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-145		12/1/2016	4.65	2				5.16	9.81	7.16	12			-	Stick Up		MW	
B-145		8/19/2016						4.67	9.81	7.16	12			-	Stick Up		MW	
B-145		5/11/2016	4.4	1.75				5.41	9.81	7.16	12			-	Stick Up		MW	
B-145		5/9/2016	4.34	1.69				5.47	9.81	7.16	12			-	Stick Up		MW	
B-145		11/19/2015	5.28	2.63				4.53	9.81	7.16	12			-	Stick Up		MW	
B-145		5/15/2015	5.66	3.01				4.15	9.81	7.16	12			-	Stick Up		MW	
B-145		2/13/2015	4.56	1.91				5.25	9.81	7.16	12			-	Stick Up		MW	
B-145		12/4/2014	4.35	1.7				5.46	9.81	7.16	12			-	Stick Up		MW	
B-145		5/15/2014	4.47	1.82				5.34	9.81	7.16	12			-	Stick Up		MW	
B-145		10/16/2013	4.33	1.68				5.48	9.81	7.16	12			-	Stick Up		MW	
B-145		7/12/2013	4.41	1.76				5.4	9.81	7.16	12			-	Stick Up		MW	
B-145		3/28/2013	4.12	1.47				5.69	9.81	7.16	12			-	Stick Up		MW	
B-145		5/9/2012	4.58	1.93				5.23	9.81	7.16	12			-	Stick Up		MW	
B-145		5/18/2011	4.32	1.67				5.49	9.81	7.16	12			-	Stick Up		MW	
B-145		9/28/2010	5.32	2.67				4.49	9.81	7.16	12			-	Stick Up		MW	
B-145		7/29/2010						NA	9.81	7.16	12			-	Stick Up		MW	
B-145		6/22/2009	3.9	1.25				5.91	9.81	7.16	12			-	Stick Up		MW	
B-145		3/23/2009	5.7	3.05				4.11	9.81	7.16	12			-	Stick Up		MW	
B-145		11/25/2008	5.04	2.39				4.77	9.81	7.16	12			-	Stick Up		MW	
B-145		8/18/2008	4.47	1.82				5.34	9.81	7.16	12			-	Stick Up		MW	
B-145		6/6/2008	3.61	0.96				6.2	9.81	7.16	12			-	Stick Up		MW	
B-145		3/31/2008	4.11	1.46				5.7	9.81	7.16	12			-	Stick Up		MW	
B-145		11/15/2007	4.68	2.03				5.13	9.81	7.16	12			-	Stick Up		MW	
B-145		9/18/2007	5.65	3				4.16	9.81	7.16	12			-	Stick Up		MW	
B-145		6/4/2007	4.78	2.13				5.03	9.81	7.16	12			-	Stick Up		MW	
B-145		3/2/2007	4.46	1.81				5.35	9.81	7.16	12			-	Stick Up		MW	
B-145		11/7/2006						NA	9.81	7.16	12			-	Stick Up		MW	
B-145		8/29/2006	4.51	1.86				5.3	9.81	7.16	12			-	Stick Up		MW	
B-145		5/24/2006	4.78	2.13				5.03	9.81	7.16	12			-	Stick Up		MW	
B-145		2/8/2006						6.56	9.81	7.16	12			-	Stick Up		MW	
B-145		7/1/2005						5.5	9.81	7.16	12			-	Stick Up		MW	
B-145		3/9/2005	3.96	1.31				5.85	9.81	7.16	12			-	Stick Up		MW	
B-145		10/8/2004	3.98	1.33				5.83	9.81	7.16	12			-	Stick Up		MW	
B-145		9/17/2004	5.18	2.53				4.63	9.81	7.16	12			-	Stick Up		MW	
B-145		6/28/2004	4.95	2.3				4.86	9.81	7.16	12			-	Stick Up		MW	
B-145		3/11/2004	4.37	1.72				5.44	9.81	7.16	12			-	Stick Up		MW	
B-145		11/24/2003	4.06	1.41				5.75	9.81	7.16	12			-	Stick Up		MW	
B-145		8/20/2003	5.03	2.38				4.78	9.81	7.16	12			-	Stick Up		MW	
B-145		5/20/2003	5.35	2.7				4.46	9.81	7.16	12			-	Stick Up		MW	
B-145		3/21/2003	3.64	0.99				6.17	9.81	7.16	12			-	Stick Up		MW	
B-145		10/31/2002	4.05	1.4				5.76	9.81	7.16	12			-	Stick Up		MW	
B-145		9/23/2002	5.71	3.06				4.1	9.81	7.16	12			-	Stick Up		MW	
B-145		8/12/2002	5.85	3.2				3.96	9.81	7.16	12			-	Stick Up		MW	
B-145		6/14/2002	4.62	1.97				5.19	9.81	7.16	12			-	Stick Up		MW	
B-145		2/19/2002	5.87	3.22				3.94	9.81	7.16	12			-	Stick Up		MW	
B-145		12/11/2001	6.2	3.55				3.61	9.81	7.16	12			-	Stick Up		MW	
B-145		11/8/2001	6.21	3.56				3.6	9.81	7.16	12			-	Stick Up		MW	
B-145		11/2/2001	6.15	3.5				3.66	9.81	7.16	12			-	Stick Up		MW	
B-145		11/1/2001	6.19	3.54				3.62	9.81	7.16	12			-	Stick Up		MW	
B-145		10/26/2001	5.92	3.27				3.89	9.81	7.16	12			-	Stick Up		MW	
B-145		10/25/2001	5.81	3.16				4	9.81	7.16	12			-	Stick Up		MW	
B-145		10/17/2001	5.73	3.08				4.08	9.81	7.16	12			-	Stick Up		MW	
B-145		10/11/2001	5.79	3.14				4.02	9.81	7.16	12			-	Stick Up		MW	
B-145		10/2/2001	5.56	2.91				4.25	9.81	7.16	12			-	Stick Up		MW	
B-145		9/19/2001	5.81	3.16				4	9.81	7.16	12			-	Stick Up		MW	
B-145		9/7/2001	5.68	3.03				4.13	9.81	7.16	12			-	Stick Up		MW	
B-145		9/5/2001	5.65	3				4.16	9.81	7.16	12			-	Stick Up		MW	
B-146		5/11/2017						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		11/25/2008						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		8/18/2008						NA	7.77	7.8	12			-	Flush		MW	Unable to l

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-146		6/6/2008						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		3/31/2008						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		11/15/2007						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		9/18/2007						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		6/4/2007						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		3/2/2007	2.92	2.95				4.85	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		11/7/2006						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		8/29/2006	2.53	2.56				5.24	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		5/24/2006						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		2/8/2006						9.3	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		7/1/2005			3.2		0.27	8.85	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		5/19/2005	3.13	3.16	3.12	3.15	0.01	4.65	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		3/9/2005						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		10/8/2004	2.44	2.47	2.4	2.43	0.04	5.36	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		9/17/2004						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		6/28/2004						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		3/11/2004						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		11/24/2003	2.99	3.02	2.59	2.62	0.4	5.13	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		8/20/2003	4.19	4.22	3.25	3.28	0.94	4.39	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		5/20/2003	5.1	5.13	3.35	3.38	1.75	4.18	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		4/25/2003						NA	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		3/21/2003	6.55	6.58	5.33	5.36	1.22	2.28	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		10/31/2002	6.32	6.35	5.64	5.67	0.68	2.04	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		9/23/2002	8.02	8.05	6.93	6.96	1.09	0.69	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		8/12/2002	8.42	8.45	6.85	6.88	1.57	0.71	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		6/14/2002	6.91	6.94	5.95	5.98	0.96	1.69	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		2/19/2002	8.03	8.06	7.09	7.12	0.94	0.55	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		12/11/2001	7.8	7.83	7.29	7.32	0.51	0.41	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		11/8/2001	7.33	7.36				0.44	7.77	7.8	12			-	Flush		MW	Unable to l
B-146		11/2/2001	7.33	7.36	7.33	7.36	<0.01	0.45	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		11/1/2001	7.39	7.42	7.38	7.41	0.01	0.39	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		10/26/2001	7.24	7.27	7.23	7.26	0.01	0.54	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		10/25/2001	7.12	7.15	7.09	7.12	0.03	0.68	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		10/17/2001	7.05	7.08	7.01	7.04	0.04	0.75	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		10/11/2001	6.88	6.91	6.84	6.87	0.04	0.92	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		10/2/2001	6.91	6.94	6.84	6.87	0.07	0.92	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		9/19/2001	7.11	7.14	7.04	7.07	0.07	0.72	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-146		9/7/2001	6.91	6.94	6.9	6.93	0.01	0.87	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-146		9/5/2001	6.89	6.92	6.88	6.91	0.01	0.89	7.77	7.8	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Flush		MW	Unable to l
B-147		5/11/2017	8.21	5.91	5.94	3.64	2.27	2.65446	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		3/6/2017	6.7	4.4	6.51	4.21	0.19	2.36443	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		12/1/2016	5.57	3.27	5.55	3.25	0.02	3.34731	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		8/12/2016	6.08	3.78	6	3.7	0.08	2.88923	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		5/11/2016	5.78	3.48	5.67	3.37	0.11	3.22	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		2/8/2016	5.4	3.1	5.34	3.04	0.06	3.55	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		11/19/2015	6.21	3.91	6.07	3.77	0.14	2.81	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		8/3/2015	5.91	3.61	5.78	3.48	0.13	3.1	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		5/15/2015	6.38	4.08	6.3	4	0.08	2.59	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		2/13/2015	6.26	3.96	6.2	3.9	0.06	2.69	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		12/4/2014	6.01	3.71	5.98	3.68	0.03	2.92	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		8/18/2014	5.99	3.69	5.91	3.61	0.08	2.98	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		5/15/2014	6	3.7	5.99	3.69	0.01	2.91	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		1/23/2014	6.27	3.97	6.26	3.96	0.01	2.64	8.9	6.6	12	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE	Stick Up	Yes	RW - Inactive	
B-147		10/16/2013	6.05	3.75	6.04	3.74	0.01	2.86	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		7/12/2013	5.19	2.89	5.18	2.88	0.01	3.72	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		3/28/2013	5.74	3.44	5.73	3.43	0.01	3.17	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		2/15/2013	5.59	3.29	5.59	3.29	<0.01	3.32	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/10/2012	6.18	3.88	6.18	3.88	<0.01	2.73	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		7/30/2012	6.01	3.71	6	3.7	0.01	2.9	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		5/9/2012	5.88	3.58	5.88	3.58	<0.01	3.03	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		1/30/2012	6.03	3.73	6.03	3.73	<0.01	2.88	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/21/2011	6.27	3.97	6.27	3.97	<0.01	2.64	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		8/1/2011	6.16	3.86	6.03	3.73	0.13	2.85	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		5/18/2011	6.15	3.85	6.13	3.83	0.02	2.77	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		2/23/2011	6.33	4.03	6.33	4.03	<0.01	2.58	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/3/2010	6.09	3.79	6.09	3.79	<0.01	2.82	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/25/2010	5.82	3.52	5.82	3.52	<0.01	3.09	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/19/2010	5.71	3.41	5.71	3.41	<0.01	3.2	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-147		10/13/2010	5.7	3.4	5.62	3.32	0.08	3.27	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/28/2010	6.57	4.27	6.41	4.11	0.16	2.47	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		7/29/2010			5.96		0.24	NA	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/10/2010			6.47		0.11	NA	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/22/2009	5.55	3.25	5.41	3.11	0.14	3.47	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		3/23/2009	6.65	4.35	6.55	4.25	0.1	2.34	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/25/2008	8.15	5.85				0.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/6/2008	7.83	5.53	7.79	5.49	0.04	1.1	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/15/2007	6.12	3.82	6.05	3.75	0.07	2.84	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/18/2007	8.1	5.8				0.8	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/4/2007	6.25	3.95	6.1	3.8	0.15	2.78	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		3/2/2007	6.63	4.33	5.67	3.37	0.96	3.1	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/7/2006			5.86		0.82	NA	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		8/29/2006	6.44	4.14	5.2	2.9	1.24	3.53	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		5/24/2006	6.85	4.55	6.22	3.92	0.63	2.6	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		2/8/2006			5.63		0.69	4.14	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/1/2005			6.21		0.34	3.6	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		5/19/2005	6.31	4.01	6.06	3.76	0.25	2.81	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		4/20/2005	5.66	3.36	5.39	3.09	0.27	3.47	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		3/9/2005	5.75	3.45	5.62	3.32	0.13	3.26	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		1/12/2005	5.34	3.04	5.3	3	0.04	3.59	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		12/3/2004	6.5	4.2				2.4	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/24/2004	6	3.7				2.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/16/2004	6	3.7				2.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/12/2004	6	3.7				2.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/5/2004	6	3.7				2.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		10/22/2004	5.34	3.04	5.3	3	0.04	3.59	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/8/2004	6.15	3.85				2.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		9/24/2004	6	3.7				2.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		9/17/2004	5.5	3.2				3.4	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		9/10/2004	5.5	3.2				3.4	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		9/2/2004	6.15	3.85				2.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		8/24/2004	6.15	3.85				2.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		8/11/2004	6.15	3.85				2.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		8/4/2004	6.15	3.85				2.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/27/2004	6.15	3.85				2.75	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/21/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/14/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/9/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/28/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/10/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		5/28/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		5/18/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		5/12/2004	9.5	7.2				-0.6	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		5/7/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-147		4/29/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		4/22/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		4/15/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		4/6/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		4/2/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		3/25/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		3/17/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		3/11/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		3/3/2004	10.4	8.1				-1.5	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		2/17/2004	6.93	4.63	5.91	3.61	1.02	2.85	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		2/10/2004	6.43	4.13	5.5	3.2	0.93	3.27	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		2/3/2004	6.94	4.64	6.58	4.28	0.36	2.27	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		1/6/2004	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		12/30/2003	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		12/22/2003	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		12/8/2003	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		12/2/2003	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/24/2003	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/19/2003	8.1	5.8				0.8	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/11/2003	8.2	5.9				0.7	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		11/5/2003	6.45	4.15	5.27	2.97	1.18	3.47	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/22/2003	6.67	4.37	5.7	3.4	0.97	3.07	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/13/2003	5.95	3.65	5.83	3.53	0.12	3.05	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/7/2003	6.77	4.47	6.06	3.76	0.71	2.74	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/1/2003	6.56	4.26	5.65	3.35	0.91	3.13	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/24/2003	6.14	3.84	5.36	3.06	0.78	3.44	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/3/2003	6.55	4.25	6.52	4.22	0.03	2.38	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		8/27/2003	8	5.7				0.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		8/20/2003	7.8	5.5	7.8	5.5	<0.01	1.11	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		8/12/2003	8	5.7	8	5.7	<0.01	0.91	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		8/6/2003	8	5.7				0.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/24/2003	8	5.7				0.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		7/18/2003	8	5.7				0.9	8.9	6.6	12			-	Stick Up	Yes	RW - Inactive	
B-147		6/17/2003	7.9	5.6	7.9	5.6	<0.01	1.01	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		6/2/2003	7.85	5.55	7.85	5.55	<0.01	1.06	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		5/20/2003	6.95	4.65	5.9	3.6	1.05	2.86	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		4/28/2003	7.19	4.89	5.77	3.47	1.42	2.94	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		4/25/2003	7.19	4.89	5.76	3.46	1.43	2.95	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		3/21/2003	7.27	4.97	5.26	2.96	2.01	3.37	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/21/2002	7.26	4.96	4.79	2.49	2.47	3.78	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-147		11/20/2002	7.68	5.38	4.55	2.25	3.13	3.93	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/31/2002	7.24	4.94	5.3	3	1.94	3.34	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/23/2002	7.58	5.28	6.3	4	1.28	2.43	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		8/12/2002	7.37	5.07	6.43	4.13	0.94	2.34	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		6/14/2002	6.7	4.4	5.7	3.4	1	3.07	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		2/19/2002	6.76	4.46	6.32	4.02	0.44	2.52	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		12/11/2001	6.62	4.32	6.61	4.31	0.01	2.29	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/8/2001	6.41	4.11	6.36	4.06	0.05	2.53	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/2/2001	6.47	4.17	6.41	4.11	0.06	2.48	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		11/1/2001	6.61	4.31	6.42	4.12	0.19	2.45	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/26/2001	6.4	4.1	6.2	3.9	0.2	2.67	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/25/2001	6.3	4	6.08	3.78	0.22	2.79	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/17/2001	6.39	4.09	6.16	3.86	0.23	2.71	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/11/2001	6.5	4.2	6.19	3.89	0.31	2.67	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		10/2/2001	6.36	4.06	6.18	3.88	0.18	2.7	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/19/2001	6.39	4.09	6.25	3.95	0.14	2.63	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/7/2001	6.14	3.84	6.14	3.84	<0.01	2.77	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-147		9/5/2001	6.21	3.91	6.12	3.82	0.09	2.77	8.9	6.6	12	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up	Yes	RW - Inactive	
B-148	MW-1	5/11/2017	5.91	3.88	5.41	3.38	0.5	1.7434	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	12/1/2016	5.77	3.74	4.91	2.88	0.86	2.19545	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	5/11/2016	6.03	4	5.14	3.11	0.89	1.96	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	11/19/2015	6.07	4.04	5.16	3.13	0.91	1.94	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	5/15/2015	6.11	4.08	5.42	3.39	0.69	1.71	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	2/18/2015	6.35	4.32	5.75	3.72	0.6	1.39	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	12/4/2014	6.09	4.06	5.44	3.41	0.65	1.69	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	5/14/2014	5.98	3.95	5.58	3.55	0.4	1.59	7.22	5.19	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-148	MW-1	10/16/2013	5.76	3.73	5.28	3.25	0.48	1.88	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	7/12/2013	5.55	3.52	5.04	3.01	0.51	2.11	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	3/28/2013	5.62	3.59	5.04	3.01	0.58	2.1	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	5/9/2012	5.61	3.58	5.13	3.1	0.48	2.03	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-148	MW-1	5/18/2011	5.92	3.89	5.7	3.67	0.22	1.49	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	7/29/2010			5.19		0.41	NA	7.22	5.19	11			-	Stick Up		MW	
B-148	MW-1	6/22/2009	5.71	3.68	5.05	3.02	0.66	2.08	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	3/23/2009	6.1	4.07	5.64	3.61	0.46	1.52	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	11/25/2008	6.12	4.09	5.43	3.4	0.69	1.7	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	6/6/2008	6.11	4.08	5.43	3.4	0.68	1.7	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	11/15/2007	5.55	3.52	5.39	3.36	0.16	1.81	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	6/4/2007	5.73	3.7	5.73	3.7	<0.01	1.5	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	11/7/2006			4.98		3.12	NA	7.22	5.19	11			-	Stick Up		MW	
B-148	MW-1	5/24/2006	6.79	4.76	4.88	2.85	1.91	2.08	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	5/19/2005	5.45	3.42	5.4	3.37	0.05	1.81	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	10/8/2004	4.77	2.74	4.75	2.72	0.02	2.47	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-148	MW-1	11/24/2003	4.65	2.62	4.65	2.62	<0.01	2.58	7.22	5.19	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-149	MW-2	5/11/2017	3.63	1.69	3.09	1.15	0.54	4.57807	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	12/1/2016	3.33	1.39	2.72	0.78	0.61	4.93875	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	5/11/2016	3.37	1.43	2.7	0.76	0.67	4.95	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	11/19/2015	4.03	2.09	3.44	1.5	0.59	4.22	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	5/15/2015	4.34	2.4	3.87	1.93	0.47	3.81	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	2/13/2015	3.88	1.94	3.12	1.18	0.76	4.52	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	12/4/2014	3.52	1.58	2.8	0.86	0.72	4.84	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	5/14/2014	3.8	1.86	2.75	0.81	1.05	4.85	7.74	5.8	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-149	MW-2	10/16/2013	3.31	1.37				4.43	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	7/12/2013	3.22	1.28				4.52	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	3/28/2013	3.31	1.37				4.43	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	5/9/2012	3.33	1.39				4.41	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	5/18/2011	3.54	1.6				4.2	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	7/29/2010			2.95		<0.01	NA	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	6/22/2009	2.57	0.63				5.17	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	3/23/2009	4.38	2.44				3.36	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	11/25/2008	3.97	2.03	3.97	2.03	<0.01	NA	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	6/6/2008	3.93	1.99				3.81	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	11/15/2007	3.3	1.36				4.44	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	6/4/2007	4.5	2.56				3.24	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	11/7/2006						NA	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	5/24/2006	3.15	1.21				4.59	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	5/19/2005	3.43	1.49				4.31	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	10/8/2004	2.8	0.86				4.94	7.74	5.8	11			-	Stick Up		MW	
B-149	MW-2	11/24/2003	2.55	0.61				5.19	7.74	5.8	11			-	Stick Up		MW	
B-150	MW-3	5/11/2017	5.21	3.24	5.09	3.12	0.12	2.69402	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	

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Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-150	MW-3	12/1/2016	5.47	3.5	2.85	0.88	2.62	4.60102	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	8/19/2016						2.19	7.8	5.83	11			-	Stick Up		MW	
B-150	MW-3	5/11/2016	5.98	4.01	2.67	0.7	3.31	4.69	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	5/11/2016	6.08	4.11				1.72	7.8	5.83	11			-	Stick Up		MW	
B-150	MW-3	11/19/2015	5.86	3.89	3.45	1.48	2.41	4.03	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	5/15/2015	5.81	3.84	3.84	1.87	1.97	3.7	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	2/13/2015	5.9	3.93	3.05	1.08	2.85	4.37	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	12/4/2014	5.75	3.78	2.72	0.75	3.03	4.68	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	5/14/2014	5.9	3.93	2.71	0.74	3.19	4.67	7.8	5.83	11	B-150	0.8668	100% UNKNOWN AROMATICS	Stick Up		MW	
B-150	MW-3	10/16/2013	6.17	4.2	3.06	1.09	3.11	4.32	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	7/12/2013	6.15	4.18	2.96	0.99	3.19	4.41	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	3/28/2013	6.15	4.18	3.08	1.11	3.07	4.31	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	5/9/2012	5.84	3.87	3.36	1.39	2.48	4.11	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	5/18/2011	5.5	3.53	3.43	1.46	2.07	4.09	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	7/29/2010			3.8		1.8	NA	7.8	5.83	11			-	Stick Up		MW	
B-150	MW-3	6/22/2009	5.22	3.25	2.43	0.46	2.79	4.99	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	3/23/2009	5.45	3.48	4.4	2.43	1.05	3.26	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	11/25/2008	5.44	3.47	3.75	1.78	1.69	3.82	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	6/6/2008	4.62	2.65	3.89	1.92	0.73	3.81	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	11/15/2007	3.91	1.94	3.26	1.29	0.65	4.45	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	6/4/2007	4.77	2.8	0.46	-1.51	4.31	6.76	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	11/7/2006			2.98		1.27	NA	7.8	5.83	11			-	Stick Up		MW	
B-150	MW-3	5/24/2006	4.3	2.33	3.04	1.07	1.26	4.59	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	5/19/2005	4.65	2.68	3.22	1.25	1.43	4.39	7.8	5.83	11	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-150	MW-3	10/8/2004	2.84	0.87				4.96	7.8	5.83	11			-	Stick Up		MW	
B-150	MW-3	11/24/2003	2.45	0.48				5.35	7.8	5.83	11			-	Stick Up		MW	
B-151		5/11/2017	3.86	1.89				3.875	7.735	5.77	13			-	Stick Up		MW	
B-151		5/11/2016	3.55	1.58				4.19	7.735	5.77	13			-	Stick Up		MW	
B-151		5/15/2015	4.63	2.66				3.11	7.735	5.77	13			-	Stick Up		MW	
B-151		12/4/2014	3.45	1.48				4.29	7.735	5.77	13			-	Stick Up		MW	
B-151		5/14/2014	3.53	1.56				4.21	7.735	5.77	13			-	Stick Up		MW	
B-151		10/16/2013	3.69	1.72				4.05	7.735	5.77	13			-	Stick Up		MW	
B-151		3/28/2013	3.58	1.61				4.16	7.735	5.77	13			-	Stick Up		MW	
B-151		5/9/2012	3.91	1.94				3.83	7.735	5.77	13			-	Stick Up		MW	
B-151		5/18/2011	3.75	1.78				3.99	7.735	5.77	13			-	Stick Up		MW	
B-151		7/29/2010						NA	7.735	5.77	13			-	Stick Up		MW	
B-151		6/22/2009	2.67	0.7				5.07	7.735	5.77	13			-	Stick Up		MW	
B-151		3/23/2009	4.43	2.46				3.31	7.735	5.77	13			-	Stick Up		MW	
B-151		11/25/2008	3.8	1.83				3.94	7.735	5.77	13			-	Stick Up		MW	
B-151		6/6/2008	4.07	2.11				3.67	7.735	5.77	13			-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-151		11/15/2007	3.45	1.48				4.29	7.735	5.77	13			-	Stick Up		MW	
B-151		6/4/2007	3.81	1.84				3.93	7.735	5.77	13			-	Stick Up		MW	
B-151		11/7/2006						NA	7.735	5.77	13			-	Stick Up		MW	
B-151		5/24/2006	3.44	1.47				4.3	7.735	5.77	13			-	Stick Up		MW	
B-152		5/11/2017	1.28	1.74				3.756	5.036	5.5	10			-	Flush		MW	
B-152		5/11/2016	0.84	1.3				4.2	5.036	5.5	10			-	Flush		MW	
B-152		5/9/2016	0.47	0.93				4.566	5.036	5.5	10			-	Flush		MW	
B-152		5/15/2015	2.06	2.52				2.98	5.036	5.5	10			-	Flush		MW	
B-152		12/4/2014	1.23	1.69				3.81	5.036	5.5	10			-	Flush		MW	
B-152		5/14/2014	1.25	1.71				3.79	5.036	5.5	10			-	Flush		MW	
B-152		10/16/2013	1.46	1.92				3.58	5.036	5.5	10			-	Flush		MW	
B-152		3/28/2013	1.36	1.82				3.68	5.036	5.5	10			-	Flush		MW	
B-152		5/9/2012	1.19	1.65				3.85	5.036	5.5	10			-	Flush		MW	
B-152		5/18/2011	1.25	1.71				3.79	5.036	5.5	10			-	Flush		MW	
B-152		7/30/2010						NA	5.036	5.5	10			-	Flush		MW	
B-152		6/22/2009	0.38	0.84				4.66	5.036	5.5	10			-	Flush		MW	
B-152		3/23/2009	1.86	2.32				3.18	5.036	5.5	10			-	Flush		MW	
B-152		11/25/2008	1.46	1.92				3.58	5.036	5.5	10			-	Flush		MW	
B-152		6/6/2008	0.73	1.19				4.31	5.036	5.5	10			-	Flush		MW	
B-152		11/15/2007	1.77	2.23				3.27	5.036	5.5	10			-	Flush		MW	
B-152		6/4/2007	1.96	2.42				3.08	5.036	5.5	10			-	Flush		MW	
B-152		11/7/2006						NA	5.036	5.5	10			-	Flush		MW	
B-152		5/24/2006	1.29	1.75				3.75	5.036	5.5	10			-	Flush		MW	
B-153		5/11/2017	2.08	2.38				4.287	6.367	6.67	10			-	Flush		MW	
B-153		5/11/2016	2.4	2.7				3.97	6.367	6.67	10			-	Flush		MW	
B-153		5/4/2016	2.5	2.8				3.867	6.367	6.67	10			-	Flush		MW	
B-153		5/15/2015	2.55	2.85				3.82	6.367	6.67	10			-	Flush		MW	
B-153		12/4/2014	1.74	2.04				4.63	6.367	6.67	10			-	Flush		MW	
B-153		5/14/2014	2.43	2.73				3.94	6.367	6.67	10			-	Flush		MW	
B-153		10/16/2013	2.01	2.31				4.36	6.367	6.67	10			-	Flush		MW	
B-153		3/28/2013	2.16	2.46				4.21	6.367	6.67	10			-	Flush		MW	
B-153		5/9/2012	1.67	1.97				4.7	6.367	6.67	10			-	Flush		MW	
B-153		5/18/2011	2.13	2.43				4.24	6.367	6.67	10			-	Flush		MW	
B-153		7/29/2010			1.81		<0.01	NA	6.367	6.67	10			-	Flush		MW	
B-153		6/22/2009	1.45	1.75				4.92	6.367	6.67	10			-	Flush		MW	
B-153		3/23/2009	2.39	2.69				3.98	6.367	6.67	10			-	Flush		MW	
B-153		11/25/2008	2.23	2.53				4.14	6.367	6.67	10			-	Flush		MW	
B-153		6/6/2008	2.25	2.55				4.12	6.367	6.67	10			-	Flush		MW	
B-153		11/15/2007	1.95	2.25				4.42	6.367	6.67	10			-	Flush		MW	
B-153		6/4/2007	1.96	2.26				4.41	6.367	6.67	10			-	Flush		MW	
B-153		11/7/2006						NA	6.367	6.67	10			-	Flush		MW	
B-153		5/24/2006	1.59	1.89				4.78	6.367	6.67	10			-	Flush		MW	
B-154		5/11/2017	2.72	0.47				5.96	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		12/1/2016	3	0.75				5.68	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/11/2016	3.28	1.03				5.4	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/10/2016	3.36	1.11				5.32	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		11/19/2015	3.72	1.47				4.96	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/15/2015	4.16	1.91				4.52	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		2/13/2015	3.33	1.08				5.35	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		12/4/2014	3.09	0.84				5.59	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/14/2014	2.95	0.7				5.73	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		10/16/2013	3.16	0.91				5.52	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		7/12/2013	3.13	0.88				5.55	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		3/28/2013	3.12	0.87				5.56	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/9/2012	3.33	1.08				5.35	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/18/2011	4.65	2.4				4.03	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		7/29/2010						NA	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		6/22/2009	3.76	1.51				4.92	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		3/23/2009	5.29	3.04				3.39	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		11/25/2008	4.88	2.63				3.8	8.68	6.43	13			-	Stick Up		MW	Damaged

Table 3

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-154		6/6/2008	4.88	2.63				3.8	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		11/15/2007	4.27	2.02				4.41	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		6/4/2007	5.29	3.04				3.39	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		11/7/2006						NA	8.68	6.43	13			-	Stick Up		MW	Damaged
B-154		5/24/2006	4.17	1.92				4.51	8.68	6.43	13			-	Stick Up		MW	Damaged
B-155		5/11/2017	5.1	3.1				3.441	8.541	6.54	13			-	Stick Up		MW	
B-155		12/1/2016	4.95	2.95				3.591	8.541	6.54	13			-	Stick Up		MW	
B-155		5/11/2016	5.23	3.23				3.31	8.541	6.54	13			-	Stick Up		MW	
B-155		5/5/2016	5.07	3.07				3.471	8.541	6.54	13			-	Stick Up		MW	
B-155		11/19/2015	5.4	3.4				3.14	8.541	6.54	13			-	Stick Up		MW	
B-155		5/15/2015	5.57	3.57				2.97	8.541	6.54	13			-	Stick Up		MW	
B-155		2/13/2015	4.85	2.85				3.69	8.541	6.54	13			-	Stick Up		MW	
B-155		12/4/2014	4.66	2.66				3.88	8.541	6.54	13			-	Stick Up		MW	
B-155		5/14/2014	4.53	2.53				4.01	8.541	6.54	13			-	Stick Up		MW	
B-155		10/16/2013	4.89	2.89				3.65	8.541	6.54	13			-	Stick Up		MW	
B-155		7/12/2013	4.63	2.63				3.91	8.541	6.54	13			-	Stick Up		MW	
B-155		3/28/2013	4.78	2.78				3.76	8.541	6.54	13			-	Stick Up		MW	
B-155		5/9/2012	4.76	2.76				3.78	8.541	6.54	13			-	Stick Up		MW	
B-155		5/18/2011	4.87	2.87				3.67	8.541	6.54	13			-	Stick Up		MW	
B-155		7/29/2010						NA	8.541	6.54	13			-	Stick Up		MW	
B-155		6/22/2009	4.3	2.3				4.24	8.541	6.54	13			-	Stick Up		MW	
B-155		3/23/2009	5.58	3.58				2.96	8.541	6.54	13			-	Stick Up		MW	
B-155		11/25/2008	5.39	3.39				3.15	8.541	6.54	13			-	Stick Up		MW	
B-155		6/6/2008	5.13	3.13				3.41	8.541	6.54	13			-	Stick Up		MW	
B-155		11/15/2007	4.76	2.76				3.78	8.541	6.54	13			-	Stick Up		MW	
B-155		6/4/2007	5.56	3.56				2.98	8.541	6.54	13			-	Stick Up		MW	
B-155		11/7/2006						NA	8.541	6.54	13			-	Stick Up		MW	
B-155		5/24/2006	4.96	2.96				3.58	8.541	6.54	13			-	Stick Up		MW	
B-156		5/11/2017	5.18	2.97				3.676	8.856	6.65	13			-	Stick Up		MW	
B-156		12/1/2016	5.92	3.71				2.936	8.856	6.65	13			-	Stick Up		MW	
B-156		5/11/2016	5.52	3.31				3.34	8.856	6.65	13			-	Stick Up		MW	
B-156		5/10/2016	5.6	3.39				3.256	8.856	6.65	13			-	Stick Up		MW	
B-156		11/19/2015	6	3.79				2.86	8.856	6.65	13			-	Stick Up		MW	
B-156		5/15/2015	6.2	3.99				2.66	8.856	6.65	13			-	Stick Up		MW	
B-156		12/4/2014	5.4	3.19				3.46	8.856	6.65	13			-	Stick Up		MW	
B-156		5/14/2014	5.25	3.04				3.61	8.856	6.65	13			-	Stick Up		MW	
B-156		10/16/2013	5.82	3.61				3.04	8.856	6.65	13			-	Stick Up		MW	
B-156		7/12/2013	5.54	3.33				3.32	8.856	6.65	13			-	Stick Up		MW	
B-156		3/28/2013	5.39	3.18				3.47	8.856	6.65	13			-	Stick Up		MW	
B-156		5/9/2012	5.59	3.38				3.27	8.856	6.65	13			-	Stick Up		MW	
B-156		5/18/2011	5.7	3.49				3.16	8.856	6.65	13			-	Stick Up		MW	
B-156		7/29/2010						NA	8.856	6.65	13			-	Stick Up		MW	
B-156		6/22/2009	4.87	2.66				3.99	8.856	6.65	13			-	Stick Up		MW	
B-156		3/23/2009	5.9	3.69				2.96	8.856	6.65	13			-	Stick Up		MW	
B-156		11/25/2008	5.81	3.6				3.05	8.856	6.65	13			-	Stick Up		MW	
B-156		6/6/2008	5.59	3.38	5.59	3.38	<0.01	NA	8.856	6.65	13			-	Stick Up		MW	
B-156		11/15/2007	6.1	3.89				2.76	8.856	6.65	13			-	Stick Up		MW	
B-156		6/4/2007	5.67	3.46				3.19	8.856	6.65	13			-	Stick Up		MW	
B-156		11/7/2006						NA	8.856	6.65	13			-	Stick Up		MW	
B-156		5/24/2006	5.14	2.93				3.72	8.856	6.65	13			-	Stick Up		MW	
B-157		5/11/2017	1.79	2.13				3.134	4.924	5.26	12			-	Flush		MW	Unable to l
B-157		11/25/2008						NA	4.924	5.26	12			-	Flush		MW	Unable to l
B-157		6/6/2008						NA	4.924	5.26	12			-	Flush		MW	Unable to l
B-157		11/15/2007	1.46	1.8				3.46	4.924	5.26	12			-	Flush		MW	Unable to l
B-157		6/4/2007	1.57	1.91				3.35	4.924	5.26	12			-	Flush		MW	Unable to l
B-157		11/7/2006						NA	4.924	5.26	12			-	Flush		MW	Unable to l
B-157		5/24/2006	1.75	2.09				3.17	4.924	5.26	12			-	Flush		MW	Unable to l
B-158		5/11/2017	2.35	2.8				5.859	8.209	8.66	12			-	Flush		MW	
B-158		8/19/2016						5.199	8.209	8.66	12			-	Flush		MW	
B-158		5/11/2016	2.86	3.31				5.35	8.209	8.66	12			-	Flush		MW	

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B-158		5/9/2016	2.58	3.03				5.629	8.209	8.66	12			-	Flush		MW	
B-158		5/20/2015	4.03	4.48				4.18	8.209	8.66	12.2			-	Flush		MW	
B-158		5/15/2015	3.99	4.44				4.22	8.209	8.66	12			-	Flush		MW	
B-158		12/4/2014	3.1	3.55				5.11	8.209	8.66	12			-	Flush		MW	
B-158		6/2/2014	3.15	3.6				5.06	8.209	8.66	11.8			-	Flush		MW	
B-158		5/14/2014	3.2	3.65				5.01	8.209	8.66	12			-	Flush		MW	
B-158		10/16/2013	3.21	3.66				5	8.209	8.66	12			-	Flush		MW	
B-158		3/28/2013	2.87	3.32				5.34	8.209	8.66	12			-	Flush		MW	
B-158		5/9/2012	2.86	3.31				5.35	8.209	8.66	12			-	Flush		MW	
B-158		5/18/2011	3.3	3.75				4.91	8.209	8.66	12			-	Flush		MW	
B-158		7/29/2010						NA	8.209	8.66	12			-	Flush		MW	
B-158		6/22/2009	1.91	2.36				6.3	8.209	8.66	12			-	Flush		MW	
B-158		3/23/2009	3.25	3.7				4.96	8.209	8.66	12			-	Flush		MW	
B-158		11/25/2008	2.95	3.4				5.26	8.209	8.66	12			-	Flush		MW	
B-158		6/6/2008	1.96	2.41				6.25	8.209	8.66	12			-	Flush		MW	
B-158		11/15/2007	2.69	3.14				5.52	8.209	8.66	12			-	Flush		MW	
B-158		6/4/2007	2.84	3.29				5.37	8.209	8.66	12			-	Flush		MW	
B-158		11/7/2006						NA	8.209	8.66	12			-	Flush		MW	
B-158		5/24/2006	2.93	3.38				5.28	8.209	8.66	12			-	Flush		MW	
B-159		5/11/2017						NA	6.1924	8.51	10			-	Flush		MW	Destroyed
B-159		5/9/2012						NA	6.1924	8.51	10			-	Flush		MW	Destroyed
B-159		5/18/2011						NA	6.1924	8.51	10			-	Flush		MW	Destroyed
B-159		7/30/2010						NA	6.1924	8.51	10			-	Flush		MW	Destroyed
B-159		11/25/2008						NA	6.1924	8.51	10			-	Flush		MW	Destroyed
B-160		5/11/2017	4.27	4.69				4.262	8.532	8.95	10			-	Flush		MW	
B-160		5/11/2016	4.18	4.6				4.35	8.532	8.95	10			-	Flush		MW	
B-160		5/15/2015	4.42	4.84				4.11	8.532	8.95	10			-	Flush		MW	
B-160		12/9/2014	4.06	4.48				4.47	8.532	8.95	10			-	Flush		MW	
B-160		5/14/2014	3.94	4.36				4.59	8.532	8.95	10			-	Flush		MW	
B-160		10/16/2013	4.37	4.79				4.16	8.532	8.95	10			-	Flush		MW	
B-160		7/12/2013	3.82	4.24				4.71	8.532	8.95	10			-	Flush		MW	
B-160		3/28/2013	4	4.42				4.53	8.532	8.95	10			-	Flush		MW	
B-160		5/9/2012	4.56	4.98				3.97	8.532	8.95	10			-	Flush		MW	
B-160		5/18/2011	4.23	4.65				4.3	8.532	8.95	10			-	Flush		MW	
B-160		7/30/2010						NA	8.532	8.95	10			-	Flush		MW	
B-160		6/22/2009	3.8	4.22				4.73	8.532	8.95	10			-	Flush		MW	
B-160		11/25/2008	4.64	5.06				3.89	8.532	8.95	10			-	Flush		MW	
B-160		6/6/2008	4.32	4.74				4.21	8.532	8.95	10			-	Flush		MW	
B-160		11/15/2007	4.31	4.73				4.22	8.532	8.95	10			-	Flush		MW	
B-160		6/4/2007	3.94	4.36				4.59	8.532	8.95	10			-	Flush		MW	
B-160		11/7/2006						NA	8.532	8.95	10			-	Flush		MW	
B-160		5/24/2006	3.5	3.92				5.03	8.532	8.95	10			-	Flush		MW	
B-161		5/11/2017	4.77	3.45	4.61	3.29	0.16	3.65982	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		12/1/2016	5.07	3.75	4.76	3.44	0.31	3.48153	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		5/11/2016	4.38	3.06	4.32	3	0.06	3.97	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		11/19/2015	5.09	3.77	5.09	3.77	<0.01	3.22	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		5/15/2015	5.45	4.13	5.16	3.84	0.29	3.09	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		2/13/2015	5.24	3.92	4.7	3.38	0.54	3.5	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-161		12/4/2014	4.13	2.81	3.94	2.62	0.19	4.32	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		5/14/2014	4.66	3.34	4.35	3.03	0.31	3.89	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		10/16/2013	4.6	3.28	4.32	3	0.28	3.93	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		7/12/2013	4.33	3.01	4.08	2.76	0.25	4.17	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		3/28/2013	4.31	2.99	4.13	2.81	0.18	4.14	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		5/9/2012	5.48	4.16	5.3	3.98	0.18	2.97	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		5/18/2011	5.32	4	5.22	3.9	0.1	3.06	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		10/25/2010	5.24	3.92				3.06	8.3	6.98	15			-	Stick Up		MW	
B-161		10/19/2010	5.02	3.7				3.28	8.3	6.98	15			-	Stick Up		MW	
B-161		10/13/2010	5.18	3.86	5.15	3.83	0.03	3.14	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		9/28/2010	6.65	5.33	6.32	5	0.33	1.92	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		7/29/2010			5.5		0.08	NA	8.3	6.98	15			-	Stick Up		MW	
B-161		6/22/2009	4.69	3.37	4.69	3.37	<0.01	3.62	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		11/25/2008	5.31	3.99				2.99	8.3	6.98	15			-	Stick Up		MW	
B-161		6/6/2008	5.29	3.97	5.27	3.95	0.02	3.03	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		11/15/2007	5.62	4.3	5.62	4.3	<0.01	2.69	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-161		6/4/2007	5.39	4.07				2.91	8.3	6.98	15			-	Stick Up		MW	
B-161		11/7/2006			5.44		0.01	NA	8.3	6.98	15			-	Stick Up		MW	
B-161		5/24/2006	6.32	5	6.31	4.99	0.01	1.99	8.3	6.98	15	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
B-162		5/11/2017	2.49	-0.17				5.099	7.589	4.93	18			-	Stick Up		MW	
B-162		5/11/2016						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		5/10/2016	2.25	-0.41				5.339	7.589	4.93	18			-	Stick Up		MW	
B-162		5/15/2015	2.68	0.02				4.91	7.589	4.93	18			-	Stick Up		MW	
B-162		12/4/2014						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		5/14/2014						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		10/16/2013						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		3/28/2013	3.35	0.69				4.24	7.589	4.93	18			-	Stick Up		MW	
B-162		5/9/2012	3.25	0.59				4.34	7.589	4.93	18			-	Stick Up		MW	
B-162		5/18/2011	3.38	0.72				4.21	7.589	4.93	18			-	Stick Up		MW	
B-162		7/29/2010						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		6/22/2009						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		11/25/2008	2.85	0.19				4.74	7.589	4.93	18			-	Stick Up		MW	
B-162		6/6/2008	3.37	0.71				4.22	7.589	4.93	18			-	Stick Up		MW	
B-162		11/15/2007	3.33	0.67				4.26	7.589	4.93	18			-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-162		6/4/2007	3.82	1.16				3.77	7.589	4.93	18			-	Stick Up		MW	
B-162		11/7/2006						NA	7.589	4.93	18			-	Stick Up		MW	
B-162		5/24/2006	3.31	0.65				4.28	7.589	4.93	18			-	Stick Up		MW	
B-163		5/11/2017	1.94	2.17				5.512	7.452	7.68	10			-	Flush		MW	
B-163		12/1/2016	0.96	1.19				6.492	7.452	7.68	10			-	Flush		MW	
B-163		5/11/2016	1.51	1.74				5.94	7.452	7.68	10			-	Flush		MW	
B-163		5/10/2016	1.68	1.91				5.772	7.452	7.68	10			-	Flush		MW	
B-163		11/19/2015	2.35	2.58				5.1	7.452	7.68	10			-	Flush		MW	
B-163		5/15/2015	2.6	2.83				4.85	7.452	7.68	10			-	Flush		MW	
B-163		2/13/2015	1.14	1.37				6.31	7.452	7.68	10			-	Flush		MW	
B-163		12/4/2014	1.26	1.49				6.19	7.452	7.68	10			-	Flush		MW	
B-163		5/14/2014	1.31	1.54				6.14	7.452	7.68	10			-	Flush		MW	
B-163		10/16/2013	1.56	1.79				5.89	7.452	7.68	10			-	Flush		MW	
B-163		7/12/2013	2.2	2.43				5.25	7.452	7.68	10			-	Flush		MW	
B-163		3/28/2013	1.84	2.07				5.61	7.452	7.68	10			-	Flush		MW	
B-163		5/9/2012	2.09	2.32				5.36	7.452	7.68	10			-	Flush		MW	
B-163		5/18/2011	1.38	1.61				6.07	7.452	7.68	10			-	Flush		MW	
B-163		7/30/2010						NA	7.452	7.68	10			-	Flush		MW	
B-163		6/22/2009	1.36	1.59				6.09	7.452	7.68	10			-	Flush		MW	
B-163		11/25/2008	2.22	2.45				5.23	7.452	7.68	10			-	Flush		MW	
B-163		6/6/2008	1.67	1.9				5.78	7.452	7.68	10			-	Flush		MW	
B-163		11/15/2007	1.84	2.07				5.61	7.452	7.68	10			-	Flush		MW	
B-163		6/4/2007	1.43	1.66				6.02	7.452	7.68	10			-	Flush		MW	
B-163		11/7/2006						NA	7.452	7.68	10			-	Flush		MW	
B-163		5/24/2006	2.76	2.99				4.69	7.452	7.68	10			-	Flush		MW	
B-164		5/11/2017	5.5	2.54				3.322	8.822	5.86	15			-	Stick Up		MW	
B-164		8/19/2016						3.372	8.822	5.86	15			-	Stick Up		MW	
B-164		5/11/2016	5.07	2.11				3.75	8.822	5.86	15			-	Stick Up		MW	
B-164		5/9/2016	4.79	1.83				4.032	8.822	5.86	15			-	Stick Up		MW	
B-164		5/15/2015	4.49	1.53				4.33	8.822	5.86	15			-	Stick Up		MW	
B-164		12/4/2014	5.43	2.47				3.39	8.822	5.86	15			-	Stick Up		MW	
B-164		5/14/2014	5.63	2.67				3.19	8.822	5.86	15			-	Stick Up		MW	
B-164		10/16/2013	5.04	2.08				3.78	8.822	5.86	15			-	Stick Up		MW	
B-164		3/28/2013	5.18	2.22				3.64	8.822	5.86	15			-	Stick Up		MW	
B-164		5/9/2012	5.61	2.65				3.21	8.822	5.86	15			-	Stick Up		MW	
B-164		5/18/2011	5.39	2.43				3.43	8.822	5.86	15			-	Stick Up		MW	
B-164		7/29/2010						NA	8.822	5.86	15			-	Stick Up		MW	
B-164		6/22/2009	3.67	0.71				5.15	8.822	5.86	15			-	Stick Up		MW	
B-164		3/23/2009	6.27	3.31				2.55	8.822	5.86	15			-	Stick Up		MW	
B-164		11/25/2008	5.57	2.61				3.25	8.822	5.86	15			-	Stick Up		MW	
B-164		6/6/2008	5.67	2.71				3.15	8.822	5.86	15			-	Stick Up		MW	
B-164		11/15/2007	5.5	2.54				3.32	8.822	5.86	15			-	Stick Up		MW	
B-164		6/4/2007	5.76	2.8				3.06	8.822	5.86	15			-	Stick Up		MW	
B-164		11/7/2006						NA	8.822	5.86	15			-	Stick Up		MW	
B-164		5/24/2006	5.61	2.65				3.21	8.822	5.86	15			-	Stick Up		MW	
B-165		5/11/2017	2.63	2.91				3.16	5.79	6.07				-	Flush		MW	
B-165		5/11/2016	2.82	3.1				2.97	5.79	6.07				-	Flush		MW	
B-165		5/5/2016	2.84	3.12				2.95	5.79	6.07				-	Flush		MW	
B-165		5/20/2015	3.44	3.72				2.35	5.79	6.07	12.8			-	Flush		MW	
B-165		5/15/2015	3.44	3.72				2.35	5.79	6.07				-	Flush		MW	
B-165		12/4/2014	2.66	2.94				3.13	5.79	6.07				-	Flush		MW	
B-165		6/3/2014	2.68	2.96				3.11	5.79	6.07	12.8			-	Flush		MW	
B-165		5/14/2014	2.84	3.12				2.95	5.79	6.07				-	Flush		MW	
B-165		10/16/2013	2.67	2.95				3.12	5.79	6.07				-	Flush		MW	
B-165		3/28/2013	3.23	3.51				2.56	5.79	6.07				-	Flush		MW	
B-166		5/11/2017						NA	7.47	7.89				-	Flush		MW	unable to a
B-166		5/11/2016	2.78	3.2				4.69	7.47	7.89				-	Flush		MW	unable to a
B-166		5/15/2015	3.09	3.51				4.38	7.47	7.89				-	Flush		MW	unable to a
B-166		12/4/2014	1.98	2.4				5.49	7.47	7.89				-	Flush		MW	unable to a
B-166		5/14/2014	3.02	3.44				4.45	7.47	7.89				-	Flush		MW	unable to a

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-166		10/16/2013	3.17	3.59				4.3	7.47	7.89				-	Flush		MW	unable to a
B-166		3/28/2013	2.68	3.1				4.79	7.47	7.89				-	Flush		MW	unable to a
B-167		5/11/2017	3.55	4.03				3.18	6.73	7.21				-	Flush		MW	
B-167		5/11/2016	3.17	3.65				3.56	6.73	7.21				-	Flush		MW	
B-167		5/15/2015	3.84	4.32				2.89	6.73	7.21				-	Flush		MW	
B-167		12/4/2014	5.65	6.13				1.08	6.73	7.21				-	Flush		MW	
B-167		5/14/2014	3.35	3.83				3.38	6.73	7.21				-	Flush		MW	
B-167		10/16/2013	3.28	3.76				3.45	6.73	7.21				-	Flush		MW	
B-167		3/28/2013	2.42	2.9				4.31	6.73	7.21				-	Flush		MW	
B-168		5/11/2017	2.07	2.38				4.39	6.46	6.77				-	Flush		MW	
B-168		5/11/2016	2.41	2.72				4.05	6.46	6.77				-	Flush		MW	
B-168		5/4/2016	2.57	2.88				3.89	6.46	6.77				-	Flush		MW	
B-168		5/15/2015	2.74	3.05				3.72	6.46	6.77				-	Flush		MW	
B-168		12/4/2014	2.48	2.79				3.98	6.46	6.77				-	Flush		MW	
B-168		5/14/2014	2.64	2.95				3.82	6.46	6.77				-	Flush		MW	
B-168		10/16/2013	2.26	2.57				4.2	6.46	6.77				-	Flush		MW	
B-168		3/28/2013	2.49	2.8				3.97	6.46	6.77				-	Flush		MW	
B-169		5/11/2017	1.74	2.09				4.38	6.12	6.47				-	Flush		MW	
B-169		8/19/2016						3.9	6.12	6.47				-	Flush		MW	
B-169		5/11/2016	1.89	2.24				4.23	6.12	6.47				-	Flush		MW	
B-169		5/9/2016	1.72	2.07				4.4	6.12	6.47				-	Flush		MW	
B-169		5/15/2015	2.24	2.59				3.88	6.12	6.47				-	Flush		MW	
B-169		12/4/2014	1.72	2.07				4.4	6.12	6.47				-	Flush		MW	
B-169		5/14/2014	1.97	2.32				4.15	6.12	6.47				-	Flush		MW	
B-169		10/16/2013	1.7	2.05				4.42	6.12	6.47				-	Flush		MW	
B-169		3/28/2013						NA	6.12	6.47				-	Flush		MW	
B-170		5/11/2017	1.7	1.81				-1.66	0.04	0.15				-	Flush		MW	
B-170		8/19/2016						-2.33	0.04	0.15				-	Flush		MW	
B-170		5/11/2016	1.75	1.86				-1.71	0.04	0.15				-	Flush		MW	
B-170		5/5/2016	2.14	2.25				-2.1	0.04	0.15				-	Flush		MW	
B-170		5/15/2015	2.35	2.46				-2.31	0.04	0.15				-	Flush		MW	
B-170		12/4/2014	1.94	2.05				-1.9	0.04	0.15				-	Flush		MW	
B-170		5/14/2014	1.9	2.01				-1.86	0.04	0.15				-	Flush		MW	
B-170		10/16/2013	1.71	1.82				-1.67	0.04	0.15				-	Flush		MW	
B-170		3/28/2013	1.76	1.87				-1.72	0.04	0.15				-	Flush		MW	
B-172		5/11/2017	5.09	2.23				2.92	8.01	5.15				-	Stick Up		MW	Reserved
B-172		8/19/2016						NA		5.15				-			MW	Reserved
B-172		5/5/2016	5.15					NA		5.15				-			MW	Reserved
B-173		5/11/2017	4.68	2.2				3.5	8.18	5.7				-	Stick Up		MW	Reserved
B-173		8/19/2016						NA		5.7				-			MW	Reserved
B-173		5/11/2016	4.62					NA		5.7				-			MW	Reserved
B-173		5/5/2016	4.59					NA		5.7				-			MW	Reserved
B-174		5/11/2017	3	0.2				5.3	8.3	5.5				-	Stick Up		MW	Reserved
B-174		8/19/2016						NA		5.5				-			MW	Reserved
B-174		5/11/2016	2.85					NA		5.5				-			MW	Reserved
B-174		5/5/2016	2.99					NA		5.5				-			MW	Reserved
B-175		5/17/2017	7.71	4.84	3.92	1.05	3.79	4.10716	8.77	5.9		B-175	0.804	UNKNOWN	Stick Up		MW	
B-175		8/19/2016						NA		5.9				-			MW	
B-175		5/11/2016	7.43					NA		5.9				-			MW	
B-39		5/11/2017	1.39	1.45				4.09	5.48	5.54	15			-	Flush		MW	
B-39		8/19/2016						3	5.48	5.54	15			-	Flush		MW	
B-39		5/11/2016	1.58	1.64	1.12	1.18	0.46	4.3	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		5/11/2016	1.71	1.77				3.77	5.48	5.54	15			-	Flush		MW	
B-39		5/15/2015	3.2	3.26	2.7	2.76	0.5	2.72	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-39		12/4/2014	1.86	1.92	1.85	1.91	0.01	3.63	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		5/14/2014	2	2.06				3.48	5.48	5.54	15			-	Flush		MW	
B-39		10/16/2013	1.51	1.57				3.97	5.48	5.54	15			-	Flush		MW	
B-39		3/28/2013	1.4	1.46				4.08	5.48	5.54	15			-	Flush		MW	
B-39		5/9/2012	1.49	1.55				3.99	5.48	5.54	15			-	Flush		MW	
B-39		5/18/2011	1.85	1.91				3.63	5.48	5.54	15			-	Flush		MW	
B-39		7/30/2010						NA	5.48	5.54	15			-	Flush		MW	
B-39		6/22/2009						NA	5.48	5.54	15			-	Flush		MW	
B-39		11/25/2008	2.21	2.27				3.27	5.48	5.54	15			-	Flush		MW	
B-39		6/6/2008	1.11	1.17				4.37	5.48	5.54	15			-	Flush		MW	
B-39		11/15/2007	2.16	2.22	2.16	2.22	<0.01	3.33	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		6/4/2007	2.45	2.51				3.03	5.48	5.54	15			-	Flush		MW	
B-39		11/7/2006						NA	5.48	5.54	15			-	Flush		MW	
B-39		5/24/2006	2.25	2.31	2.24	2.3	0.01	3.24	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		5/19/2005	2.72	2.78	2.72	2.78	<0.01	2.77	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		10/8/2004	1.92	1.98	1.85	1.91	0.07	3.62	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		9/17/2004						NA	5.48	5.54	15			-	Flush		MW	
B-39		11/24/2003	1.49	1.55	1.26	1.32	0.23	4.19	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		4/25/2003	2.83	2.89	2.26	2.32	0.57	3.15	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		11/1/2002	1.85	1.91	1.15	1.21	0.7	4.24	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		10/31/2002	1.79	1.85	1.11	1.17	0.68	4.28	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		11/8/2001	4.5	4.56	3.73	3.79	0.77	1.65	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		11/9/2000	2.48	2.54				3	5.48	5.54	15			-	Flush		MW	
B-39		11/18/1999	2.43	2.49				3.05	5.48	5.54	15			-	Flush		MW	
B-39		11/12/1998						NA	5.48	5.54	15			-	Flush		MW	
B-39		11/13/1997						NA	5.48	5.54	15			-	Flush		MW	
B-39		11/18/1996	1.55	1.61	1.55	1.61	<0.01	3.94	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		6/6/1996	2.45	2.51	2.42	2.48	0.03	3.06	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-39		12/18/1995	1.75	1.81	1.13	1.19	0.62	4.27	5.48	5.54	15	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE	Flush		MW	
B-40		5/11/2017						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/25/2008						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		6/6/2008						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/15/2007						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		6/4/2007						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-40		11/7/2006						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		5/24/2006						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		5/19/2005						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		3/9/2005						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		10/8/2004						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		9/17/2004						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/24/2003						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/8/2001						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/9/2000						NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		12/6/1999	1.21	0.16				5.96	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/18/1999	1.9	0.85				5.27	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/12/1998	2	0.95				5.17	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/13/1997	1.02	-0.03				6.15	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		11/18/1996	0.99	-0.06	0.98	-0.07	0.01	NA	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-40		12/18/1995	0.83	-0.22				6.34	7.17	6.12	13			-	Stick Up		MW	Destroyed
B-41		5/11/2017						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/25/2008						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		6/6/2008						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/15/2007						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		6/4/2007						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/7/2006						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		5/24/2006						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		5/19/2005						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		10/8/2004						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/24/2003						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		10/31/2002	1.64	0.59				7.21	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/8/2001						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/18/1999						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/12/1998						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		9/17/1998						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/13/1997						NA	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		11/18/1996	2.38	1.33				6.47	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-41		12/18/1995	1.92	0.87				6.93	8.85	7.8	12			-	Stick Up		MW	Destroyed
B-42		5/11/2017						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/25/2008						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		6/6/2008						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/15/2007						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		6/4/2007						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/7/2006						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		5/24/2006						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		5/19/2005						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		10/21/2004						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		10/8/2004						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/24/2003						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/8/2001						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/18/1999						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/12/1998						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		9/17/1998						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/13/1997						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-42		11/18/1996						NA	8.04	6.99	15			-	Stick Up		MW	Destroyed
B-43		5/11/2017	2.72	2.65				4.49	7.21	7.14	14.5			-	Stick Up		MW	
B-43		8/19/2016						2.85	7.21	7.14	14.5			-	Stick Up		MW	
B-43		5/11/2016	3.9	3.83				3.31	7.21	7.14	14.5			-	Stick Up		MW	
B-43		5/20/2015	3.65	3.58				3.56	7.21	7.14	14.5			-	Stick Up		MW	
B-43		12/4/2014	4.45	4.38	4.45	4.38	<0.01	2.77	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		5/14/2014	4.92	4.85				2.29	7.21	7.14	14.5			-	Stick Up		MW	
B-43		10/16/2013	4.47	4.4	4.45	4.38	0.02	2.76	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-43		3/28/2013	4.15	4.08	4.08	4.01	0.07	3.12	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		5/9/2012	4.11	4.04	4.09	4.02	0.02	3.12	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		6/2/2011	4.56	4.49	4.43	4.36	0.13	2.77	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		7/30/2010			3.45		0.17	NA	7.21	7.14	14.5			-	Stick Up		MW	
B-43		6/22/2009	3.17	3.1	3.05	2.98	0.12	4.15	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/25/2008	4.96	4.89	4.78	4.71	0.18	2.41	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		6/6/2008	4.94	4.87	4.75	4.68	0.19	2.44	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/15/2007	4.25	4.18	4.1	4.03	0.15	3.1	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		6/4/2007	4.52	4.45	4.3	4.23	0.22	2.89	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/7/2006			4.24		0.47	NA	7.21	7.14	14.5			-	Stick Up		MW	
B-43		5/24/2006	1.97	1.9	1.47	1.4	0.5	5.7	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		5/19/2005	5.36	5.29	4.77	4.7	0.59	2.39	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		10/8/2004	4.6	4.53	4	3.93	0.6	3.16	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/24/2003	4.87	4.8	4.46	4.39	0.41	2.72	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		10/31/2002	4.44	4.37	4.44	4.37	<0.01	2.78	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/8/2001	5.2	5.13	5	4.93	0.2	2.19	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/9/2000	5.26	5.19	4.79	4.72	0.47	2.38	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/18/1999	3.13	3.06	2.64	2.57	0.49	4.53	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		5/21/1999	4.93	4.86	4.65	4.58	0.28	2.54	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		5/20/1999	5.35	5.28	4.58	4.51	0.77	2.57	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		12/16/1998	5.23	5.16	4.74	4.67	0.49	2.43	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/13/1998	5.42	5.35	4.92	4.85	0.5	2.25	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/12/1998	5.8	5.73	4.85	4.78	0.95	2.28	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		9/17/1998	5.71	5.64	4.65	4.58	1.06	2.47	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/13/1997	5.33	5.26	5.02	4.95	0.31	2.16	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		11/18/1996	5.41	5.34	5.11	5.04	0.3	2.07	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		6/6/1996	5.43	5.36	5.06	4.99	0.37	2.12	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-43		12/18/1995	5.32	5.25	4.59	4.52	0.73	2.56	7.21	7.14	14.5	B-43	0.9161	100% MIDDLE DISTILLATE	Stick Up		MW	
B-44		5/11/2017						NA	8.21	7.16	15			-	Stick Up		MW	Destroyed
B-44		11/25/2008						NA	8.21	7.16	15			-	Stick Up		MW	Destroyed
B-44		11/12/1998						NA	8.21	7.16	15			-	Stick Up		MW	Destroyed
B-44		9/17/1998						NA	8.21	7.16	15			-	Stick Up		MW	Destroyed
B-44		11/13/1997	2.12	1.07				6.09	8.21	7.16	15			-	Stick Up		MW	Destroyed
B-44		11/18/1996	2.43	1.38				5.78	8.21	7.16	15			-	Stick Up		MW	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-44		12/18/1995	1.91	0.86				6.3	8.21	7.16	15			-	Stick Up		MW	Destroyed
B-45		5/11/2017	0.13	-0.07				4.969	5.099	4.9	15			-	Stick Up		MW	
B-45		5/11/2016	0.77	0.57				4.33	5.099	4.9	15			-	Stick Up		MW	
B-45		5/5/2016	0.95	0.75				4.149	5.099	4.9	15			-	Stick Up		MW	
B-45		5/15/2015	1.86	1.66				3.24	5.099	4.9	15			-	Stick Up		MW	
B-45		12/4/2014	0.51	0.31				4.59	5.099	4.9	15			-	Stick Up		MW	
B-45		5/14/2014	1.05	0.85				4.05	5.099	4.9	15			-	Stick Up		MW	
B-45		10/16/2013	1.03	0.83				4.07	5.099	4.9	15			-	Stick Up		MW	
B-45		3/28/2013	1.09	0.89				4.01	5.099	4.9	15			-	Stick Up		MW	
B-45		5/9/2012	0.95	0.75				4.15	5.099	4.9	15			-	Stick Up		MW	
B-45		5/18/2011	1.42	1.22				3.68	5.099	4.9	15			-	Stick Up		MW	
B-45		7/30/2010						NA	5.099	4.9	15			-	Stick Up		MW	
B-45		6/22/2009	0.59	0.39				4.51	5.099	4.9	15			-	Stick Up		MW	
B-45		11/25/2008	1.47	1.27				3.63	5.099	4.9	15			-	Stick Up		MW	
B-45		6/6/2008	1.28	1.08				3.82	5.099	4.9	15			-	Stick Up		MW	
B-45		6/4/2007	1.25	1.05				3.85	5.099	4.9	15			-	Stick Up		MW	
B-45		11/7/2006						NA	5.099	4.9	15			-	Stick Up		MW	
B-45		5/24/2006	1.8	1.6				3.3	5.099	4.9	15			-	Stick Up		MW	
B-45		5/19/2005	1.55	1.35				3.55	5.099	4.9	15			-	Stick Up		MW	
B-45		10/8/2004	1.55	1.35				3.55	5.099	4.9	15			-	Stick Up		MW	
B-45		11/24/2003	1.51	1.31				3.59	5.099	4.9	15			-	Stick Up		MW	
B-45		10/31/2002	1.47	1.27				3.63	5.099	4.9	15			-	Stick Up		MW	
B-45		11/8/2001	3.07	2.87				2.03	5.099	4.9	15			-	Stick Up		MW	
B-45		11/9/2000	2.64	2.44				2.46	5.099	4.9	15			-	Stick Up		MW	
B-45		11/18/1999	2.58	2.38				2.52	5.099	4.9	15			-	Stick Up		MW	
B-45		11/12/1998	2.72	2.52				2.38	5.099	4.9	15			-	Stick Up		MW	
B-45		8/26/1998	1.9	1.7				3.2	5.099	4.9	15			-	Stick Up		MW	
B-45		11/13/1997	1.87	1.67				3.23	5.099	4.9	15			-	Stick Up		MW	
B-45		11/18/1996	2.21	2.01				2.89	5.099	4.9	15			-	Stick Up		MW	
B-45		12/18/1995	1.54	1.34				3.56	5.099	4.9	15			-	Stick Up		MW	
B-46		5/11/2017	1.44	1.73				6.59	8.03	8.32	12			-	Flush		MW	
B-46		5/11/2016	0.93	1.22				7.1	8.03	8.32	12			-	Flush		MW	
B-46		5/15/2015	2.19	2.48				5.84	8.03	8.32	12			-	Flush		MW	
B-46		12/4/2014	0.81	1.1				7.22	8.03	8.32	12			-	Flush		MW	
B-46		5/14/2014	1.44	1.73				6.59	8.03	8.32	12			-	Flush		MW	
B-46		10/16/2013	1.5	1.79				6.53	8.03	8.32	12			-	Flush		MW	
B-46		3/28/2013	0.7	0.99				7.33	8.03	8.32	12			-	Flush		MW	
B-46		5/9/2012	1.58	1.87				6.45	8.03	8.32	12			-	Flush		MW	
B-46		5/18/2011	1.25	1.54				6.78	8.03	8.32	12			-	Flush		MW	
B-46		7/30/2010						NA	8.03	8.32	12			-	Flush		MW	
B-46		6/22/2009	0.65	0.94				7.38	8.03	8.32	12			-	Flush		MW	
B-46		11/25/2008	1.81	2.1				6.22	8.03	8.32	12			-	Flush		MW	
B-46		6/6/2008	0.8	1.09				7.23	8.03	8.32	12			-	Flush		MW	
B-46		6/4/2007	1.68	1.97				6.35	8.03	8.32	12			-	Flush		MW	
B-46		11/7/2006						NA	8.03	8.32	12			-	Flush		MW	
B-46		5/24/2006	1.43	1.72				6.6	8.03	8.32	12			-	Flush		MW	
B-46		5/19/2005	2.09	2.38				5.94	8.03	8.32	12			-	Flush		MW	
B-46		10/8/2004	1.92	2.21				6.11	8.03	8.32	12			-	Flush		MW	
B-46		11/24/2003	1.75	2.04				6.28	8.03	8.32	12			-	Flush		MW	
B-46		10/31/2002	0.98	1.27				7.05	8.03	8.32	12			-	Flush		MW	
B-46		11/8/2001	3.15	3.44				4.88	8.03	8.32	12			-	Flush		MW	
B-46		11/9/2000	2.46	2.75				5.57	8.03	8.32	12			-	Flush		MW	
B-46		11/18/1999	3.42	3.71				4.61	8.03	8.32	12			-	Flush		MW	
B-46		11/12/1998	2.62	2.91				5.41	8.03	8.32	12			-	Flush		MW	
B-46		11/13/1997	1.6	1.89				6.43	8.03	8.32	12			-	Flush		MW	
B-46		11/18/1996	1.89	2.18				6.14	8.03	8.32	12			-	Flush		MW	
B-46		12/18/1995	1.48	1.77				6.55	8.03	8.32	12			-	Flush		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-47		5/11/2017			1.47	1.17		NA	8.3	8	13	B-47	0.9796	100% RESIDUAL OIL TRACE% UNKNOWN AROMATICS	Stick Up		MW	
B-47		5/12/2016	3.14	2.84	3.13	2.83	0.01	5.17	8.3	8	13	B-47	0.9796	100% RESIDUAL OIL TRACE% UNKNOWN AROMATICS	Stick Up		MW	
B-47		5/15/2015	3.7	3.4	3.69	3.39	0.01	4.61	8.3	8	13	B-47	0.9796	100% RESIDUAL OIL TRACE% UNKNOWN AROMATICS	Stick Up		MW	
B-47		12/4/2014	3.43	3.13	3.43	3.13	<0.01	4.88	8.3	8	13	B-47	0.9796	100% RESIDUAL OIL TRACE% UNKNOWN AROMATICS	Stick Up		MW	
B-47		5/14/2014	3.01	2.71	3	2.7	0.01	5.3	8.3	8	13	B-47	0.9796	100% RESIDUAL OIL TRACE% UNKNOWN AROMATICS	Stick Up		MW	
B-47		10/16/2013	3.36	3.06	3.36	3.06	<0.01	4.95	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		3/28/2013	3.23	2.93	3.22	2.92	0.01	5.08	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		5/9/2012	3.25	2.95	3.23	2.93	0.02	5.07	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		5/18/2011	3.2	2.9	3.2	2.9	<0.01	5.11	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		7/30/2010			2.91		0.01	NA	8.3	8	13			-	Stick Up		MW	
B-47		6/22/2009	2.55	2.25	2.54	2.24	0.01	5.76	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/25/2008	3.75	3.45	3.75	3.45	<0.01	4.56	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		8/18/2008			2.92	2.62		NA	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		6/6/2008			3.24	2.94		NA	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		3/31/2008	3.26	2.96	3.25	2.95	0.01	5.05	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/15/2007	3.8	3.5	3.79	3.49	0.01	4.51	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		9/18/2007	3.56	3.26	3.55	3.25	0.01	4.75	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		6/4/2007	3.23	2.93	3.22	2.92	0.01	5.08	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		3/2/2007						NA	8.3	8	13			-	Stick Up		MW	
B-47		11/7/2006			3.66		<0.01	NA	8.3	8	13			-	Stick Up		MW	
B-47		8/29/2006	3.12	2.82	3.12	2.82	<0.01	5.19	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		5/24/2006	3.51	3.21	3.5	3.2	0.01	4.8	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		2/8/2006			3.78		0.01	5.59	8.3	8	13			-	Stick Up		MW	
B-47		7/1/2005			4.08		0.01	5.43	8.3	8	13			-	Stick Up		MW	
B-47		5/19/2005	4.19	3.89	4.18	3.88	0.01	4.12	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		3/9/2005	3.4	3.1	3.39	3.09	0.01	4.91	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		10/8/2004	4.24	3.94	4.24	3.94	<0.01	4.07	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		9/17/2004						NA	8.3	8	13			-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-47		11/24/2003	3.68	3.38	3.6	3.3	0.08	4.69	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		10/31/2002	4.2	3.9	4.04	3.74	0.16	4.24	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/8/2001	5.17	4.87	5.13	4.83	0.04	3.16	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/9/2000	4.81	4.51	4.65	4.35	0.16	3.63	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/18/1999	5.14	4.84	5.1	4.8	0.04	3.19	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/12/1998	4.93	4.63	4.53	4.23	0.4	3.72	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/13/1997	4.1	3.8	4.03	3.73	0.07	4.26	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		11/18/1996	3.81	3.51	3.67	3.37	0.14	4.61	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-47		12/18/1995	3.87	3.57	3.85	3.55	0.02	4.45	8.3	8	13	B-144	0.8654	90% GASOLINE, 10% RESIDUAL OIL	Stick Up		MW	
B-48		5/17/2017	0.25	0.55				6.25	6.5	6.8	14			-	Flush		MW	
B-48		5/11/2016						NA	6.5	6.8	14			-	Flush		MW	
B-48		5/15/2015	0.81	1.11				5.69	6.5	6.8	14			-	Flush		MW	
B-48		12/4/2014	0	0.3				6.5	6.5	6.8	14			-	Flush		MW	
B-48		5/14/2014	0.28	0.58				6.22	6.5	6.8	14			-	Flush		MW	
B-48		10/16/2013	0.03	0.33				6.47	6.5	6.8	14			-	Flush		MW	
B-48		3/28/2013	0.13	0.43				6.37	6.5	6.8	14			-	Flush		MW	
B-48		5/9/2012	0	0.3				6.5	6.5	6.8	14			-	Flush		MW	
B-48		5/18/2011	0.61	0.91				5.89	6.5	6.8	14			-	Flush		MW	
B-48		7/29/2010						NA	6.5	6.8	14			-	Flush		MW	
B-48		6/22/2009						NA	6.5	6.8	14			-	Flush		MW	
B-48		11/25/2008	0.84	1.14				5.66	6.5	6.8	14			-	Flush		MW	
B-48		6/6/2008						NA	6.5	6.8	14			-	Flush		MW	
B-48		11/15/2007	0.61	0.91				5.89	6.5	6.8	14			-	Flush		MW	
B-48		6/4/2007	0.22	0.52				6.28	6.5	6.8	14			-	Flush		MW	
B-48		11/7/2006						NA	6.5	6.8	14			-	Flush		MW	
B-48		5/24/2006	0.49	0.79				6.01	6.5	6.8	14			-	Flush		MW	
B-48		5/19/2005	0.87	1.17				5.63	6.5	6.8	14			-	Flush		MW	
B-48		10/8/2004	0.6	0.9				5.9	6.5	6.8	14			-	Flush		MW	
B-48		9/17/2004	0.75	1.05				5.75	6.5	6.8	14			-	Flush		MW	
B-48		11/24/2003	0.17	0.47				6.33	6.5	6.8	14			-	Flush		MW	
B-48		10/31/2002						NA	6.5	6.8	14			-	Flush		MW	
B-48		11/8/2001						NA	6.5	6.8	14			-	Flush		MW	
B-48		11/9/2000	1.1	1.4				5.4	6.5	6.8	14			-	Flush		MW	
B-48		11/18/1999	1.18	1.48				5.32	6.5	6.8	14			-	Flush		MW	
B-48		11/12/1998	1.8	2.1				4.7	6.5	6.8	14			-	Flush		MW	
B-48		11/13/1997	1	1.3				5.5	6.5	6.8	14			-	Flush		MW	
B-48		11/18/1996	0.72	1.02				5.78	6.5	6.8	14			-	Flush		MW	
B-48		12/18/1995	0.36	0.66				6.14	6.5	6.8	14			-	Flush		MW	
B-48D		5/17/2017	11.5	10.85				-2.08	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/11/2016	11.46	10.81				-2.04	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/3/2016	11.07	10.42				-1.65	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/15/2015	11.38	10.73				-1.96	9.42	8.77	55			-	Stick Up		MW	
B-48D		12/4/2014	11.91	11.26				-2.49	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/15/2014	10.71	10.06				-1.29	9.42	8.77	55			-	Stick Up		MW	
B-48D		10/16/2013	11.64	10.99				-2.22	9.42	8.77	55			-	Stick Up		MW	
B-48D		3/28/2013	12.36	11.71				-2.94	9.42	8.77	55			-	Stick Up		MW	
B-48D		3/21/2013	11.93	11.28				-2.51	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/2/2012	11.66	11.01				-2.24	9.42	8.77	55			-	Stick Up		MW	
B-48D		10/25/2012	11.66	11.01				-2.24	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/9/2012	10.98	10.33				-1.56	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/18/2011	10.46	9.81				-1.04	9.42	8.77	55			-	Stick Up		MW	

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Philadelphia Refining Complex, AOI 6

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B-48D		7/29/2010						NA	9.42	8.77	55			-	Stick Up		MW	
B-48D		6/22/2009	10.79	10.14				-1.37	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/25/2008	11.57	10.92				-2.15	9.42	8.77	55			-	Stick Up		MW	
B-48D		6/6/2008	11.35	10.7				-1.93	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/15/2007	11.33	10.68				-1.91	9.42	8.77	55			-	Stick Up		MW	
B-48D		6/4/2007	11.12	10.47				-1.7	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/7/2006						NA	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/24/2006	12.07	11.42				-2.65	9.42	8.77	55			-	Stick Up		MW	
B-48D		5/19/2005	11.86	11.21				-2.44	9.42	8.77	55			-	Stick Up		MW	
B-48D		10/8/2004	11.97	11.32				-2.55	9.42	8.77	55			-	Stick Up		MW	
B-48D		9/17/2004	12.25	11.6				-2.83	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/24/2003	11.49	10.84				-2.07	9.42	8.77	55			-	Stick Up		MW	
B-48D		10/31/2002	14.19	13.54				-4.77	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/8/2001	13.32	12.67				-3.9	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/9/2000	11.93	11.28				-2.51	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/18/1999	12.4	11.75				-2.98	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/12/1998	12.93	12.28				-3.51	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/13/1997	13.27	12.62				-3.85	9.42	8.77	55			-	Stick Up		MW	
B-48D		11/18/1996	11.84	11.19				-2.42	9.42	8.77	55			-	Stick Up		MW	
B-48D		12/18/1995	13.25	12.6				-3.83	9.42	8.77	55			-	Stick Up		MW	
B-92		5/11/2017	5.6	2.67				4.63	10.23	7.3	15.5			-	Stick Up		MW	
B-92		12/1/2016	5.94	3.01				4.29	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/11/2016	5.44	2.51				4.79	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/19/2015	5.9	2.97				4.33	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/15/2015	6.47	3.54				3.76	10.23	7.3	15.5			-	Stick Up		MW	
B-92		2/13/2015	5.5	2.57				4.73	10.23	7.3	15.5			-	Stick Up		MW	
B-92		12/4/2014	5.09	2.16				5.14	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/14/2014	5.12	2.19				5.11	10.23	7.3	15.5			-	Stick Up		MW	
B-92		10/16/2013	5.17	2.24				5.06	10.23	7.3	15.5			-	Stick Up		MW	
B-92		7/12/2013	4.96	2.03				5.27	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/28/2013	5.06	2.13				5.17	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/9/2012	5.26	2.33				4.97	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/18/2011	5.2	2.27				5.03	10.23	7.3	15.5			-	Stick Up		MW	
B-92		7/29/2010						NA	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/22/2009	4.67	1.74				5.56	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/25/2008	5.38	2.45				4.85	10.23	7.3	15.5			-	Stick Up		MW	
B-92		8/18/2008	5.13	2.2				5.1	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/6/2008	4.56	1.63				5.67	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/31/2008	4.67	1.74				5.56	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/15/2007	5.36	2.43				4.87	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/18/2007	6.3	3.37				3.93	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/4/2007	5.34	2.41				4.89	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/2/2007	5.19	2.26				5.04	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/7/2006						NA	10.23	7.3	15.5			-	Stick Up		MW	
B-92		8/29/2006	5.2	2.27				5.03	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/24/2006	5.4	2.47				4.83	10.23	7.3	15.5			-	Stick Up		MW	
B-92		2/8/2006						6.2	10.23	7.3	15.5			-	Stick Up		MW	
B-92		7/1/2005						5.39	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/19/2005	5.73	2.8				4.5	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/9/2005	4.83	1.9				5.4	10.23	7.3	15.5			-	Stick Up		MW	
B-92		10/8/2004	4.86	1.93				5.37	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/17/2004	5.72	2.79				4.51	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/25/2004	5.09	2.16				5.14	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/3/2004	5.86	2.93				4.37	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/24/2003	4.85	1.92				5.38	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/18/2003	4.84	1.91				5.39	10.23	7.3	15.5			-	Stick Up		MW	
B-92		8/27/2003	5.59	2.66				4.64	10.23	7.3	15.5			-	Stick Up		MW	
B-92		7/7/2003	4.92	1.99				5.31	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/12/2003	4.58	1.65				5.65	10.23	7.3	15.5			-	Stick Up		MW	
B-92		10/31/2002	4.54	1.61				5.69	10.23	7.3	15.5			-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-92		8/12/2002	6.2	3.27				4.03	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/14/2002	5.13	2.2				5.1	10.23	7.3	15.5			-	Stick Up		MW	
B-92		2/19/2002	6.42	3.49				3.81	10.23	7.3	15.5			-	Stick Up		MW	
B-92		10/11/2001	6.25	3.32				3.98	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/19/2001	6.59	3.66				3.64	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/7/2001	6.43	3.5				3.8	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/5/2001	6.41	3.48				3.82	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/13/2001	4.71	1.78				5.52	10.23	7.3	15.5			-	Stick Up		MW	
B-92		2/19/2001	4.95	2.02				5.28	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/14/2000	5.62	2.69				4.61	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/9/2000	5.96	3.03				4.27	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/6/2000	4.81	1.88				5.42	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/16/2000	4.95	2.02				5.28	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/9/2000	5.32	2.39				4.91	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/18/1999	5.7	2.77				4.53	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/24/1999	4.34	1.41				5.89	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/15/1999	5.4	2.47				4.83	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/11/1999	5.04	2.11				5.19	10.23	7.3	15.5			-	Stick Up		MW	
B-92		12/16/1998	6.55	3.62				3.68	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/12/1998	6.68	3.75				3.55	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/11/1998	5.97	3.04				4.26	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/19/1998	4.71	1.78				5.52	10.23	7.3	15.5			-	Stick Up		MW	
B-92		3/27/1998	4.68	1.75				5.55	10.23	7.3	15.5			-	Stick Up		MW	
B-92		12/19/1997	5.85	2.92				4.38	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/13/1997	5.45	2.52				4.78	10.23	7.3	15.5			-	Stick Up		MW	
B-92		9/24/1997	5.63	2.7				4.6	10.23	7.3	15.5			-	Stick Up		MW	
B-92		7/17/1997	6.17	3.24				4.06	10.23	7.3	15.5			-	Stick Up		MW	
B-92		7/1/1997	5.84	2.91				4.39	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/20/1997	5.49	2.56				4.74	10.23	7.3	15.5			-	Stick Up		MW	
B-92		6/2/1997	5.09	2.16				5.14	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/22/1997	5.72	2.79				4.51	10.23	7.3	15.5			-	Stick Up		MW	
B-92		5/9/1997	4.77	1.84				5.46	10.23	7.3	15.5			-	Stick Up		MW	
B-92		4/22/1997	4.87	1.94				5.36	10.23	7.3	15.5			-	Stick Up		MW	
B-92		4/11/1997	5.11	2.18				5.12	10.23	7.3	15.5			-	Stick Up		MW	
B-92		11/18/1996	5.02	2.09				5.21	10.23	7.3	15.5			-	Stick Up		MW	
B-92		12/18/1995	4.78	1.85				5.45	10.23	7.3	15.5			-	Stick Up		MW	
B-93		5/11/2017						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		9/28/2010	6.02	4.86				6.81	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/25/2008						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		8/18/2008						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		6/6/2008						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		3/31/2008						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/15/2007						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		9/18/2007						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		6/4/2007						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		3/2/2007						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/7/2006						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		8/29/2006						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		5/24/2006						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		2/8/2006						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		5/19/2005						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		3/9/2005						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/24/2003	0.96	-0.2				11.87	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		10/31/2002	4.29	3.13				8.54	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/8/2001	6.34	5.18				6.49	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/9/2000						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/12/1998	4.23	3.07				8.6	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/13/1997						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-93		11/18/1996						NA	12.83	11.67	13.5			-	Stick Up		MW	Destroyed
B-94		5/11/2017	7.28	4.14				3.07	10.35	7.21	14			-	Stick Up		MW	

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LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
B-94		5/11/2016	6.76	3.62				3.59	10.35	7.21	14			-	Stick Up		MW	
B-94		5/15/2015	7.03	3.89				3.32	10.35	7.21	14			-	Stick Up		MW	
B-94		12/4/2014	7.64	4.5				2.71	10.35	7.21	14			-	Stick Up		MW	
B-94		5/14/2014	7.35	4.21				3	10.35	7.21	14			-	Stick Up		MW	
B-94		10/16/2013	7.16	4.02				3.19	10.35	7.21	14			-	Stick Up		MW	
B-94		3/28/2013	7.23	4.09				3.12	10.35	7.21	14			-	Stick Up		MW	
B-94		5/9/2012	6.76	3.62				3.59	10.35	7.21	14			-	Stick Up		MW	
B-94		5/18/2011	6.55	3.41				3.8	10.35	7.21	14			-	Stick Up		MW	
B-94		7/29/2010						NA	10.35	7.21	14			-	Stick Up		MW	
B-94		6/22/2009	6.29	3.15				4.06	10.35	7.21	14			-	Stick Up		MW	
B-94		11/25/2008	7.03	3.89				3.32	10.35	7.21	14			-	Stick Up		MW	
B-94		6/6/2008	6.36	3.22				3.99	10.35	7.21	14			-	Stick Up		MW	
B-94		11/15/2007	6.83	3.69				3.52	10.35	7.21	14			-	Stick Up		MW	
B-94		6/4/2007	6.57	3.43				3.78	10.35	7.21	14			-	Stick Up		MW	
B-94		11/7/2006						NA	10.35	7.21	14			-	Stick Up		MW	
B-94		5/24/2006	6.54	3.4				3.81	10.35	7.21	14			-	Stick Up		MW	
B-94		5/19/2005	6.73	3.59				3.62	10.35	7.21	14			-	Stick Up		MW	
B-94		10/8/2004	6.72	3.58				3.63	10.35	7.21	14			-	Stick Up		MW	
B-94		11/24/2003	6.63	3.49				3.72	10.35	7.21	14			-	Stick Up		MW	
B-94		10/31/2002	6.52	3.38				3.83	10.35	7.21	14			-	Stick Up		MW	
B-94		11/8/2001	7.39	4.25				2.96	10.35	7.21	14			-	Stick Up		MW	
B-94		11/9/2000	7.09	3.95				3.26	10.35	7.21	14			-	Stick Up		MW	
B-94		11/18/1999	7.1	3.96				3.25	10.35	7.21	14			-	Stick Up		MW	
B-94		11/12/1998	7.92	4.78				2.43	10.35	7.21	14			-	Stick Up		MW	
B-94		11/13/1997	6.95	3.81				3.4	10.35	7.21	14			-	Stick Up		MW	
B-94		11/18/1996	6.96	3.82				3.39	10.35	7.21	14			-	Stick Up		MW	
B-94		12/18/1995	6.77	3.63				3.58	10.35	7.21	14			-	Stick Up		MW	
B-95	GP U 677-	5/11/2017	4.38	2.12				4.487	8.867	6.608				-	Stick Up		MW	
B-95	GP U 677-	5/11/2016	3.94	1.68				4.93	8.867	6.608				-	Stick Up		MW	
B-95	GP U 677-	5/15/2015	6.19	3.93				2.68	8.867	6.608				-	Stick Up		MW	
B-95	GP U 677-	12/4/2014	4.48	2.22				4.39	8.867	6.608				-	Stick Up		MW	
B-95	GP U 677-	5/14/2014	5.02	2.76				3.85	8.867	6.608				-	Stick Up		MW	
B-95	GP U 677-	10/16/2013	5	2.74				3.87	8.867	6.608				-	Stick Up		MW	
C-134D		5/11/2017	11.41	8.87				-2.011	9.399	6.855	70			-	Stick Up		MW	
C-134D		7/19/2016						-2.411	9.399	6.855	70			-	Stick Up		MW	
C-134D		5/11/2016	11.27	8.73				-1.87	9.399	6.855	70			-	Stick Up		MW	
C-134D		5/15/2015	10.88	8.34				-1.48	9.399	6.855	70			-	Stick Up		MW	
C-134D		12/4/2014	11.74	9.2				-2.34	9.399	6.855	70			-	Stick Up		MW	
C-134D		5/15/2014	10.59	8.05				-1.19	9.399	6.855	70			-	Stick Up		MW	
C-134D		10/17/2013	11.57	9.03				-2.17	9.399	6.855	70			-	Stick Up		MW	
C-134D		3/28/2013	12.26	9.72				-2.86	9.399	6.855	70			-	Stick Up		MW	
C-134D		3/21/2013	11.81	9.27				-2.41	9.399	6.855	70			-	Stick Up		MW	
C-134D		11/2/2012	11.56	9.02				-2.16	9.399	6.855	70			-	Stick Up		MW	
C-134D		10/25/2012	11.56	9.02				-2.16	9.399	6.855	70			-	Stick Up		MW	
C-134D		5/9/2012	10.89	8.35				-1.49	9.399	6.855	70			-	Stick Up		MW	
C-134D		5/18/2011	4.76	2.22				4.64	9.399	6.855	70			-	Stick Up		MW	
C-134D		7/8/2010						NA	9.399	6.855	70			-	Stick Up		MW	
PS-1		11/25/2008						NA	9.02					-			MW	Destroyed
PZ-132A		5/11/2017	6.29	4.26				3.86	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132A		5/11/2016	5.95	3.92				4.2	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132A		5/15/2015	7.62	5.59				2.53	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132A		12/9/2014	5.27	3.24				4.88	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132A		5/15/2014	6.11	4.08				4.04	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132A		10/16/2013	5.84	3.81				4.31	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132A		11/25/2008						NA	10.15	8.12	10			-	Stick Up		Piezometer	
PZ-132B		5/11/2017						NA			10			-			Piezomete	Destroyed
PZ-134A		5/11/2017						NA			10			-			Piezomete	Destroyed
PZ-134B		5/11/2017						NA			10			-			Piezomete	Destroyed
PZ-135A		5/11/2017						NA	10.18	8.57	10			-	Stick Up		Piezomete	Damaged
PZ-135A		5/11/2016						NA	10.18	8.57	10			-	Stick Up		Piezomete	Damaged

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PZ-135A		5/15/2015						NA	10.18	8.57	10			-	Stick Up		Piezomete	Damaged
PZ-135A		12/4/2014						NA	10.18	8.57	10			-	Stick Up		Piezomete	Damaged
PZ-135A		5/15/2014	6.35	4.74				3.83	10.18	8.57	10			-	Stick Up		Piezomete	Damaged
PZ-135A		10/16/2013	6.27	4.66				3.91	10.18	8.57	10			-	Stick Up		Piezomete	Damaged
PZ-135A		11/25/2008						NA	10.18	8.57	10			-	Stick Up		Piezomete	Damaged
PZ-135B		5/11/2017						NA	10.21		10			-			Piezomete	Damaged
PZ-135B		5/11/2016						NA	10.21		10			-			Piezomete	Damaged
PZ-135B		5/15/2015						NA	10.21		10			-			Piezomete	Damaged
PZ-135B		12/4/2014						NA	10.21		10			-			Piezomete	Damaged
PZ-135B		5/15/2014	6.48					3.73	10.21		10			-			Piezomete	Damaged
PZ-135B		10/16/2013	6.34					3.87	10.21		10			-			Piezomete	Damaged
PZ-135B		11/25/2008						NA	10.21		10			-			Piezomete	Damaged
RW-9		5/11/2017	6.04	3.16	4.86	1.98	1.18	3.67745	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		12/1/2016	6.47	3.59	5.6	2.72	0.87	2.99592	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/11/2016	5.66	2.78	4.91	2.03	0.75	3.71	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		11/19/2015	6.02	3.14	5.33	2.45	0.69	3.3	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/15/2015	6.11	3.23	5.5	2.62	0.61	3.14	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		12/4/2014	5.64	2.76	4.9	2.02	0.74	3.72	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/14/2014	5.63	2.75	4.85	1.97	0.78	3.76	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		10/16/2013	5.86	2.98	5.06	2.18	0.8	3.55	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		7/12/2013	5.53	2.65	4.74	1.86	0.79	3.87	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/28/2013	5.85	2.97	5.09	2.21	0.76	3.53	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/9/2012	5.65	2.77	4.9	2.02	0.75	3.72	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/18/2011	5.6	2.72	4.9	2.02	0.7	3.73	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		7/29/2010			5.6		0.63	NA	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/22/2009	5.23	2.35	4.47	1.59	0.76	4.15	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/23/2009	6.35	3.47	5.91	3.03	0.44	2.77	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		11/25/2008	5.63	2.75	4.91	2.03	0.72	3.71	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
RW-9		8/18/2008	5.79	2.91	5.02	2.14	0.77	3.59	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		6/6/2008	6.58	3.7	4.93	2.05	1.65	3.52	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/31/2008	5.43	2.55	4.66	1.78	0.77	3.95	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		11/15/2007	5.85	2.97	5.07	2.19	0.78	3.54	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		9/18/2007	6.62	3.74	6.18	3.3	0.44	2.5	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		6/4/2007	5.68	2.8	4.92	2.04	0.76	3.7	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/2/2007	6.56	3.68	6.18	3.3	0.38	2.51	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		11/7/2006			4.98		0.72	5.43	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/29/2006						NA	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/24/2006	5.86	2.98	5.05	2.17	0.81	3.56	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		2/8/2006			4.92		0.86	5.43	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/1/2005			5.8		0.62	4.59	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/19/2005	6.19	3.31	5.62	2.74	0.57	3.03	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/9/2005	5.02	2.14	5.01	2.13	0.01	3.75	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		10/8/2004	4.8	1.92	4.8	1.92	<0.01	3.97	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		9/17/2004	6.05	3.17	6.05	3.17	<0.01	2.72	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		9/2/2004	5.36	2.48	5.36	2.48	<0.01	3.41	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		6/25/2004	5.53	2.65	5.53	2.65	<0.01	3.24	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		6/10/2004	4.66	1.78	4.66	1.78	<0.01	4.11	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/28/2004	4.79	1.91	4.78	1.9	0.01	3.98	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/12/2004	4.84	1.96	4.83	1.95	0.01	3.93	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		4/29/2004	5.02	2.14	5.02	2.14	<0.01	3.75	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		4/15/2004						NA	8.76	5.88				-	Stick Up	Yes	RW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
RW-9		4/2/2004	5.14	2.26	4.62	1.74	0.52	4.04	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/17/2004	5.65	2.77	5.17	2.29	0.48	3.5	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/3/2004	5.75	2.87				3.01	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/17/2004	5.4	2.52				3.36	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/3/2004	6.38	3.5				2.38	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/6/2004	5.52	2.64				3.24	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/22/2003	4.54	1.66				4.22	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/18/2003	5.17	2.29				3.59	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/5/2003	4.4	1.52				4.36	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/22/2003	4.98	2.1	4.98	2.1	<0.01	3.79	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		10/7/2003	5.28	2.4				3.48	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/24/2003	4.75	1.87				4.01	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/8/2003	5.17	2.29				3.59	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/27/2003	5.1	2.22				3.66	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/12/2003	4.91	2.03				3.85	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/18/2003	4.94	2.06				3.82	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/7/2003	4.73	1.85				4.03	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/30/2003	4.53	1.65				4.23	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/17/2003	4.35	1.47				4.41	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/2/2003	4.63	1.75				4.13	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/20/2003	5.02	2.14	5.02	2.14	<0.01	3.75	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/8/2003	4.9	2.02				3.86	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/25/2003	4.81	1.93	4.81	1.93	<0.01	3.96	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		4/9/2003	4.59	1.71	4.59	1.71	<0.01	4.18	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/26/2003	4.85	1.97	4.85	1.97	<0.01	3.92	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/12/2003	5.22	2.34	5.21	2.33	0.01	3.55	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		2/27/2003	4.69	1.81	4.65	1.77	0.04	4.1	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		2/13/2003	5.8	2.92	5.76	2.88	0.04	2.99	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		1/28/2003	5.9	3.02	5.9	3.02	<0.01	2.87	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		1/24/2003	5.94	3.06	5.94	3.06	<0.01	2.83	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		12/30/2002	6.1	3.22	4.39	1.51	1.71	4.05	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		12/19/2002	6.89	4.01	5.84	2.96	1.05	2.72	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
RW-9		12/4/2002	6.52	3.64	5.57	2.69	0.95	3.01	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		11/18/2002	4.6	1.72	4.17	1.29	0.43	4.51	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		10/31/2002	4.36	1.48	4.04	1.16	0.32	4.66	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		10/18/2002	4.87	1.99	4.57	1.69	0.3	4.13	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		10/4/2002	4.9	2.02				3.86	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/17/2002	5.28	2.4				3.48	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/4/2002	4.94	2.06				3.82	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/12/2002	5.47	2.59				3.29	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/22/2002	5.15	2.27				3.61	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/27/2002	4.93	2.05				3.83	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/14/2002	4.86	1.98				3.9	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/31/2002	5.91	3.03	4.8	1.92	1.11	3.75	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		5/15/2002	4.94	2.06				3.82	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/1/2002	4.8	1.92	4.78	1.9	0.02	3.98	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		4/19/2002	4.82	1.94	4.82	1.94	<0.01	3.95	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		4/2/2002	4.84	1.96	4.84	1.96	<0.01	3.93	8.76	5.88		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up	Yes	RW	
RW-9		3/19/2002	5.36	2.48				3.4	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/5/2002	5.85	2.97				2.91	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/19/2002	5.85	2.97				2.91	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/21/2002	5.71	2.83				3.05	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/9/2002	5.65	2.77				3.11	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/28/2001	5.71	2.83				3.05	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/11/2001	5.9	3.02				2.86	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/31/2001	6.15	3.27				2.61	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/17/2001	5.89	3.01				2.87	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/2/2001	6.52	3.64				2.24	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/19/2001	6.77	3.89				1.99	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/5/2001	7.23	4.35				1.53	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/21/2001	6.78	3.9				1.98	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/9/2001	6.7	3.82				2.06	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/26/2001	5.85	2.97				2.91	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/10/2001	5.14	2.26				3.62	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/13/2001	4.95	2.07				3.81	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/29/2001	5.35	2.47				3.41	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/17/2001	6.05	3.17				2.71	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/3/2001	5.23	2.35				3.53	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/16/2001	5.27	2.39				3.49	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/6/2001	5.29	2.41				3.47	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/20/2001	4.66	1.78				4.1	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/6/2001	5.06	2.18				3.7	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/19/2001	6.14	3.26				2.62	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/6/2001	5.74	2.86				3.02	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/23/2001	6.05	3.17				2.71	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/9/2001	6.28	3.4				2.48	8.76	5.88				-	Stick Up	Yes	RW	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
RW-9		12/12/2000	5.62	2.74				3.14	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/28/2000	5.57	2.69				3.19	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/14/2000	5.6	2.72				3.16	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/31/2000	5.63	2.75				3.13	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/18/2000	5.38	2.5				3.38	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/2/2000	5.19	2.31				3.57	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/19/2000	5.02	2.14				3.74	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/6/2000	5.4	2.52				3.36	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/23/2000	5.63	2.75				3.13	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/9/2000	5.02	2.14				3.74	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/25/2000	5.91	3.03				2.85	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/11/2000	5.91	3.03				2.85	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/27/2000	5.35	2.47				3.41	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/16/2000	5.59	2.71				3.17	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/1/2000	5.7	2.82				3.06	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/19/2000	5.57	2.69				3.19	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/4/2000	5.64	2.76				3.12	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/20/2000	4.86	1.98				3.9	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/5/2000	4.98	2.1				3.78	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/22/2000	5.04	2.16				3.72	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/9/2000	5.08	2.2				3.68	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/24/2000	4.96	2.08				3.8	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/11/2000	5.35	2.47				3.41	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/26/2000	5.96	3.08				2.8	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/14/2000	5.71	2.83				3.05	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/30/1999	5.62	2.74				3.14	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/16/1999	4.54	1.66				4.22	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/6/1999	5.17	2.29				3.59	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/1/1999	5.26	2.38				3.5	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/18/1999	5.65	2.77				3.11	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/4/1999	5.19	2.31				3.57	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/19/1999	5.13	2.25				3.63	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/7/1999	4.96	2.08				3.8	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/24/1999	3.61	0.73				5.15	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/9/1999	4.79	1.91				3.97	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/27/1999	5.13	2.25				3.63	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/12/1999	6.27	3.39				2.49	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/30/1999	6.11	3.23				2.65	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/16/1999	5.45	2.57				3.31	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/30/1999	5.45	2.57				3.31	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/15/1999	5.3	2.42				3.46	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/2/1999	4.59	1.71				4.17	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/19/1999	5.02	2.14				3.74	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/4/1999	4.85	1.97				3.91	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/20/1999	4.91	2.03				3.85	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/12/1999	4.89	2.01				3.87	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/29/1999	4.65	1.77				4.11	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/11/1999	5.63	2.75				3.13	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/2/1999	5.84	2.96				2.92	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/10/1999	4.98	2.1				3.78	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/29/1999	5.64	2.76				3.12	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/15/1999	5.67	2.79				3.09	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/29/1998	6.24	3.36				2.52	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/16/1998	6.51	3.63				2.25	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/1/1998	6.71	3.83				2.05	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/20/1998	6.62	3.74				2.14	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/4/1998	6.27	3.39				2.49	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/23/1998	6.52	3.64				2.24	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/9/1998	6.58	3.7				2.18	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/25/1998	5.72	2.84				3.04	8.76	5.88				-	Stick Up	Yes	RW	

Table 3

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
RW-9		9/11/1998	5.56	2.68				3.2	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/28/1998	5.34	2.46				3.42	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/14/1998	5.43	2.55				3.33	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/31/1998	6.52	3.64				2.24	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/16/1998	5.51	2.63				3.25	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/2/1998	5.42	2.54				3.34	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/19/1998	4.74	1.86				4.02	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/5/1998	4.75	1.87				4.01	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/20/1998	4.32	1.44				4.44	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/23/1998	4.35	1.47				4.41	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/10/1998	4.59	1.71				4.17	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/27/1998	4.61	1.73				4.15	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		3/12/1998	4.67	1.79				4.09	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/27/1998	4.97	2.09				3.79	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		2/10/1998	5.19	2.31				3.57	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/30/1998	4.81	1.93				3.95	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		1/16/1998	5.29	2.41				3.47	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/19/1997	5.71	2.83				3.05	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		12/4/1997	5.27	2.39				3.49	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/21/1997	6.05	3.17				2.71	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		11/7/1997	6.13	3.25				2.63	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/24/1997	6.86	3.98				1.9	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		10/10/1997	6.42	3.54				2.34	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/24/1997	5.93	3.05				2.83	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		9/12/1997	5.36	2.48				3.4	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/28/1997	6.03	3.15				2.73	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/14/1997	6.56	3.68				2.2	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		8/1/1997	6.05	3.17				2.71	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/17/1997	7.83	4.95				0.93	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		7/1/1997	6.09	3.21				2.67	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/20/1997	6.23	3.35				2.53	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		6/2/1997	5.25	2.37				3.51	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/22/1997	5.9	3.02				2.86	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		5/9/1997	5.27	2.39				3.49	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/22/1997	4.98	2.1				3.78	8.76	5.88				-	Stick Up	Yes	RW	
RW-9		4/11/1997	4.81	1.93				3.95	8.76	5.88				-	Stick Up	Yes	RW	
SUMP-1		5/11/2017	5.46		5.44		0.02	5.25731	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		12/1/2016	5.56		5.5		0.06	5.19192	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		8/12/2016	5.8		5.71		0.09	4.97789	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		5/11/2016	5.52		5.39		0.13	5.29	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		2/8/2016	5.25		5.12		0.13	5.56	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		11/19/2015	5.71		5.67		0.04	5.02	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		8/3/2015	5.48		5.37		0.11	5.32	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		5/20/2015	6.05		5.98		0.07	4.71	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		2/18/2015	5.9		5.86		0.04	4.83	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		12/4/2014	5.5		5.49		0.01	5.21	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	
SUMP-1		5/15/2014	5.4		5.39		0.01	5.31	10.7		10	B-144	0.8654	90% GASOLINE 10% MIDDLE DISTILLATE		Yes	RW - Inactive	

Table 3

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		10/16/2013	5.8		5.8		<0.01	4.91	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		7/12/2013	5.53		5.52		0.01	5.18	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/28/2013	5.58		5.57		0.01	5.13	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/9/2012	5.48		5.47		0.01	5.23	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/2/2011	5.64		5.64		<0.01	5.07	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/25/2010	5.38		5.38		<0.01	5.33	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/19/2010	5.36					5.34	10.7		10			-		Yes	RW - Inactive	
SUMP-1		10/13/2010	5.19					5.51	10.7		10			-		Yes	RW - Inactive	
SUMP-1		9/28/2010	6.3		6.28		0.02	4.42	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		7/29/2010			5.68		0.02	NA	10.7		10			-		Yes	RW - Inactive	
SUMP-1		6/22/2009	4.14		4.13		0.01	6.57	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		11/25/2008	6.56		6.48		0.08	4.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/6/2008	5.87		5.84		0.03	4.86	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		11/15/2007	5.86		5.85		0.01	4.85	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		9/18/2007	6.73		6.65		0.08	4.04	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/4/2007	6.27		6.2		0.07	4.49	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/2/2007	5.64		5.61		0.03	5.09	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		11/7/2006			5.74		0.04	NA	10.7		10			-		Yes	RW - Inactive	
SUMP-1		8/29/2006	5.27		5.26		0.01	5.44	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/24/2006	6.52		6.51		0.01	4.19	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/8/2006			5.39		0.05	4.19	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/1/2005			7.4		<0.01	2.61	10.7		10			-		Yes	RW - Inactive	
SUMP-1		5/19/2005	7.3					3.4	10.7		10			-		Yes	RW - Inactive	
SUMP-1		4/20/2005	5.06		5.05		0.01	5.65	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/9/2005	5.36		5.31		0.05	5.38	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		1/12/2005	5.15		5.14		0.01	5.56	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/3/2004	5.4					5.3	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/24/2004	5.4					5.3	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/16/2004	5.4					5.3	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/12/2004	5.4					5.3	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/5/2004	5.4					5.3	10.7		10			-		Yes	RW - Inactive	
SUMP-1		10/22/2004	5.07		5.04		0.03	5.66	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/8/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		9/24/2004	5.5					5.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		9/17/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		9/10/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		9/2/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		8/24/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	

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LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		8/11/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		8/4/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/27/2004	6					4.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/21/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/14/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/9/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		6/28/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		6/10/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		5/28/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		5/18/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		5/12/2004	10.4					0.3	10.7		10			-		Yes	RW - Inactive	
SUMP-1		5/7/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		4/29/2004	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		4/22/2004	9.5		9.5		<0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/15/2004	9.5		9		0.5	1.63	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/6/2004	9.5		9.5		<0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/2/2004	9.5		9.5		<0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/25/2004	9.5		9.5		<0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/17/2004	9.45		9.45		<0.01	1.26	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/11/2004	9.45		9.45		<0.01	1.26	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/3/2004	9.43					1.27	10.7		10			-		Yes	RW - Inactive	
SUMP-1		2/17/2004	9.42		9.42		<0.01	1.29	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/10/2004	9.47		9.47		<0.01	1.24	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		2/3/2004	9.47		9.47		<0.01	1.24	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		1/6/2004	9.45		9.45		<0.01	1.26	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/30/2003	9.55		9.55		<0.01	1.16	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/22/2003	9.46		9.46		<0.01	1.25	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/8/2003	9.5		9.5		<0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/2/2003	7.35		7.35		<0.01	3.36	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		11/19/2003	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/11/2003	9.5					1.2	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/5/2003	5.3		5.3		<0.01	5.41	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/22/2003	5.66		5.65		0.01	5.05	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/13/2003	5.95		5.93		0.02	4.77	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/7/2003	5.96		5.91		0.05	4.78	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/1/2003	5.68		5.68		<0.01	5.03	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		9/24/2003	5.55		5.55		<0.01	5.16	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		9/8/2003	6.4		6.4		<0.01	4.31	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		9/3/2003	6.58		6.58		<0.01	4.13	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/27/2003	9.45		9.45		<0.01	1.26	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/20/2003	9.5		9.49		0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/12/2003	9.46		9.45		0.01	1.25	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/6/2003	9.5		9.5		<0.01	1.21	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		7/24/2003	9.59		9.59		<0.01	1.12	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		7/18/2003	9.43		9.43		<0.01	1.28	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/30/2003	6		6		<0.01	4.71	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/26/2003	5.83		5.83		<0.01	4.88	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		6/17/2003	8.4		8.4		<0.01	2.31	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/13/2003	7					3.7	10.7		10			-		Yes	RW - Inactive	
SUMP-1		6/2/2003	9.45		9.45		<0.01	1.26	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/30/2003	7.45		7.45		<0.01	3.26	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/20/2003	6.05					4.65	10.7		10			-		Yes	RW - Inactive	
SUMP-1		5/8/2003	10.61		10.61		<0.01	0.1	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/28/2003	9.46		9.43		0.03	1.27	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/25/2003	10.71		10.71		<0.01	0	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/9/2003	10.64		10.64		<0.01	0.07	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/2/2003	10.55		10.55		<0.01	0.16	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/26/2003	10.13		10.13		<0.01	0.58	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/21/2003	7.87		7.87		<0.01	2.84	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/12/2003	10.79		10.79		<0.01	-0.08	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		2/25/2003	10.69		10.69		<0.01	0.02	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/21/2003	10.67		10.67		<0.01	0.04	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/13/2003	10.65		10.65		<0.01	0.06	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/6/2003	10.66		10.66		<0.01	0.05	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		1/21/2003	10.64		10.64		<0.01	0.07	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		1/10/2003	10.61		10.61		<0.01	0.1	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/30/2002	10.6		10.6		<0.01	0.11	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/27/2002	8.43		8.4		0.03	2.3	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/19/2002	7.64		7.64		<0.01	3.07	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/4/2002	8.16		8.15		0.01	2.55	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		11/26/2002	7.55		7.55		<0.01	3.16	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		11/19/2002	7.53		7.53		<0.01	3.18	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		11/5/2002	11.39		11.39		<0.01	-0.68	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/22/2002	11.35		11.35		<0.01	-0.64	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/18/2002	11.34		11.34		<0.01	-0.63	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/10/2002	11.37		11.37		<0.01	-0.66	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		10/4/2002	11.35					-0.65	10.7		10			-		Yes	RW - Inactive	
SUMP-1		9/23/2002	11.4		11.4		<0.01	-0.69	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		9/20/2002	11.34		11.34		<0.01	-0.63	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		9/4/2002	11.3		11.3		<0.01	-0.59	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/27/2002	11.35		11.35		<0.01	-0.64	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/12/2002	11.35		11.35		<0.01	-0.64	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		8/9/2002	9.77		9.77		<0.01	0.94	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		7/31/2002	11.32		11.32		<0.01	-0.61	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		7/22/2002	9.72		9.72		<0.01	0.99	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		7/16/2002	11.48					-0.78	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/12/2002	10.2					0.5	10.7		10			-		Yes	RW - Inactive	
SUMP-1		7/1/2002	11.33		11.33		<0.01	-0.62	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/27/2002	10.2					0.5	10.7		10			-		Yes	RW - Inactive	
SUMP-1		6/19/2002	10.18		10.18		<0.01	0.53	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/14/2002	9.7		9.55		0.15	1.13	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/7/2002	8.77		8.66		0.11	2.03	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/31/2002	8.82		8.77		0.05	1.92	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/21/2002	10.31		10.31		<0.01	0.4	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/15/2002	10.28		10.28		<0.01	0.43	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/1/2002	10.21		10.21		<0.01	0.5	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/24/2002	10.16		10.16		<0.01	0.55	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		4/19/2002	10.34		10.34		<0.01	0.37	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/12/2002	10.3		10.3		<0.01	0.41	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/2/2002	10.33		10.33		<0.01	0.38	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/26/2002	10.29		10.29		<0.01	0.42	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/19/2002	9.14		8.96		0.18	1.72	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/11/2002	10.32		10.32		<0.01	0.39	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/5/2002	10.32		10.32		<0.01	0.39	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/1/2002	10.31		10.31		<0.01	0.4	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/19/2002	10.31		10.31		<0.01	0.4	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/11/2002	10.32		10.3		0.02	0.4	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/7/2002	10.33		10.31		0.02	0.39	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		1/21/2002	10.33		10.32		0.01	0.38	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		1/15/2002	10.28		10.25		0.03	0.45	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		1/4/2002	10.1		10.03		0.07	0.66	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/20/2001	10.24		10.21		0.03	0.49	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		12/11/2001	10.73		9		1.73	1.47	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		6/3/1997	9.9		9.81		0.09	0.88	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/27/1997	9.96		9.96		<0.01	0.75	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/20/1997	9.97		9.97		<0.01	0.74	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/6/1997	9.95		9.95		<0.01	0.76	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		5/2/1997	9.96		9.96		<0.01	0.75	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/22/1997	9.95		9.95		<0.01	0.76	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	

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LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
SUMP-1		4/18/1997	9.95		9.95		<0.01	0.76	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/8/1997	9.94		9.94		<0.01	0.77	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		4/4/1997	9.71		9.65		0.06	1.04	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/26/1997	9.8		9.79		0.01	0.91	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/21/1997	9.97		9.97		<0.01	0.74	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/13/1997	9.97		9.97		<0.01	0.74	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		3/6/1997	9.95		9.95		<0.01	0.76	10.7		10	B-129	0.8654	75% MIDDLE DISTILLATE, 20% HEAVIER MATERIAL (CRUDE/RESIDUAL), 5% GASOLINE		Yes	RW - Inactive	
SUMP-1		2/26/1997	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		2/20/1997	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		2/11/1997	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		2/7/1997	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		1/29/1997	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		1/22/1997	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		1/15/1997	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		1/8/1997	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		12/31/1996	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		12/26/1996	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		12/20/1996	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		12/12/1996	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		12/3/1996	10.01					0.69	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/26/1996	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/22/1996	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/8/1996	9.86					0.84	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/5/1996	9.97					0.73	10.7		10			-		Yes	RW - Inactive	
SUMP-1		11/1/1996	9.98					0.72	10.7		10			-		Yes	RW - Inactive	
SUMP-1		10/30/1996	9.96					0.74	10.7		10			-		Yes	RW - Inactive	
SUMP-1		10/25/1996	8.61					2.09	10.7		10			-		Yes	RW - Inactive	
U-1		5/11/2017	7.39	3.91				3.31	10.7	7.22				-	Stick Up		MW	Damaged
U-1		12/1/2016						NA	10.7	7.22				-	Stick Up		MW	Damaged
U-1		5/11/2016						NA	10.7	7.22				-	Stick Up		MW	Damaged
U-1		11/19/2015						NA	10.7	7.22				-	Stick Up		MW	Damaged
U-1		5/15/2015						NA	10.7	7.22				-	Stick Up		MW	Damaged

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
U-1		12/4/2014	6.61	3.13				4.09	10.7	7.22				-	Stick Up		MW	Damaged
U-1		5/14/2014	7.3	3.82				3.4	10.7	7.22				-	Stick Up		MW	Damaged
U-1		10/16/2013	8.21	4.73				2.49	10.7	7.22				-	Stick Up		MW	Damaged
U-1		7/12/2013	7.72	4.24				2.98	10.7	7.22				-	Stick Up		MW	Damaged
U-1		3/28/2013	8.1	4.62				2.6	10.7	7.22				-	Stick Up		MW	Damaged
U-1		5/9/2012	8.06	4.58				2.64	10.7	7.22				-	Stick Up		MW	Damaged
U-1		5/19/2011	7.59	4.11				3.11	10.7	7.22				-	Stick Up		MW	Damaged
U-1		7/29/2010						NA	10.7	7.22				-	Stick Up		MW	Damaged
U-1		6/22/2009	7.36	3.88				3.34	10.7	7.22				-	Stick Up		MW	Damaged
U-1		11/25/2008	5.66	2.18				5.04	10.7	7.22				-	Stick Up		MW	Damaged
U-1		6/6/2008	5.54	2.06				5.16	10.7	7.22				-	Stick Up		MW	Damaged
U-1		11/15/2007	7.63	4.15				3.07	10.7	7.22				-	Stick Up		MW	Damaged
U-1		6/4/2007	7.71	4.23				2.99	10.7	7.22				-	Stick Up		MW	Damaged
U-1		11/7/2006						NA	10.7	7.22				-	Stick Up		MW	Damaged
U-1		5/24/2006	7.64	4.16				3.06	10.7	7.22				-	Stick Up		MW	Damaged
U-2		5/11/2017	6.75	4.49				2.64	9.39	7.13				-	Stick Up		MW	
U-2		12/1/2016	6.19	3.93				3.2	9.39	7.13				-	Stick Up		MW	
U-2		5/11/2016	6.59	4.33				2.8	9.39	7.13				-	Stick Up		MW	
U-2		11/19/2015	7.5	5.24				1.89	9.39	7.13				-	Stick Up		MW	
U-2		5/15/2015	7.28	5.02				2.11	9.39	7.13				-	Stick Up		MW	
U-2		12/4/2014	6.06	3.8				3.33	9.39	7.13				-	Stick Up		MW	
U-2		5/14/2014	6.21	3.95				3.18	9.39	7.13				-	Stick Up		MW	
U-2		10/16/2013	6.71	4.45				2.68	9.39	7.13				-	Stick Up		MW	
U-2		3/28/2013	6.46	4.2				2.93	9.39	7.13				-	Stick Up		MW	
U-2		5/9/2012	6.07	3.81				3.32	9.39	7.13				-	Stick Up		MW	
U-2		5/19/2011	5.38	3.12				4.01	9.39	7.13				-	Stick Up		MW	
U-2		7/29/2010						NA	9.39	7.13				-	Stick Up		MW	
U-2		6/22/2009	5.97	3.71				3.42	9.39	7.13				-	Stick Up		MW	
U-2		11/25/2008	4.82	2.56				4.57	9.39	7.13				-	Stick Up		MW	
U-2		6/6/2008	4.46	2.2				4.93	9.39	7.13				-	Stick Up		MW	
U-2		11/15/2007	6.3	4.04				3.09	9.39	7.13				-	Stick Up		MW	
U-2		6/4/2007	6.59	4.33				2.8	9.39	7.13				-	Stick Up		MW	
U-2		11/7/2006						NA	9.39	7.13				-	Stick Up		MW	
U-2		5/24/2006	6.42	4.16				2.97	9.39	7.13				-	Stick Up		MW	
U-3		5/11/2017	7.5	4.54	5.79	2.83	1.71	3.68749	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		12/1/2016	7.78	4.82	6.8	3.84	0.98	2.81517	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		5/11/2016	7.01	4.05	5.84	2.88	1.17	3.74	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		11/19/2015	7.38	4.42	6.81	3.85	0.57	2.88	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		5/15/2015	6.99	4.03	6.55	3.59	0.44	3.17	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		12/4/2014	7.6	4.64	6.28	3.32	1.32	3.27	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		5/14/2014	7.12	4.16	5.64	2.68	1.48	3.88	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		10/16/2013	7.85	4.89	6.33	3.37	1.52	3.18	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	

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U-3		3/28/2013	7.06	4.1	6.49	3.53	0.57	3.2	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		5/9/2012	7.23	4.27	6.15	3.19	1.08	3.45	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		5/19/2011	6.49	3.53	6.01	3.05	0.48	3.7	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		7/29/2010			5.55		1.35	NA	9.8	6.84				-	Stick Up		MW	
U-3		6/22/2009	6.79	3.83	6	3.04	0.79	3.65	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		3/23/2009	8.02	5.06	7.61	4.65	0.41	2.11	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		11/25/2008	5.8	2.84	5.1	2.14	0.7	4.57	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		6/6/2008	5.38	2.42	4.71	1.75	0.67	4.96	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		11/15/2007	6.9	3.94	6.52	3.56	0.38	3.21	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		6/4/2007	7.01	4.05	6.72	3.76	0.29	3.03	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-3		11/7/2006			6.21		0.69	NA	9.8	6.84				-	Stick Up		MW	
U-3		5/24/2006	7.13	4.17	6.72	3.76	0.41	3	9.8	6.84		WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		MW	
U-4		5/11/2017	3.92	1.34				5.3	9.22	6.64				-	Stick Up		MW	
U-4		12/1/2016	3.43	0.85				5.79	9.22	6.64				-	Stick Up		MW	
U-4		8/19/2016						5.44	9.22	6.64				-	Stick Up		MW	
U-4		5/11/2016	3.81	1.23				5.41	9.22	6.64				-	Stick Up		MW	
U-4		5/5/2016	3.89	1.31				5.33	9.22	6.64				-	Stick Up		MW	
U-4		11/19/2015	4.8	2.22				4.42	9.22	6.64				-	Stick Up		MW	
U-4		5/15/2015	6.49	3.91				2.73	9.22	6.64				-	Stick Up		MW	
U-4		12/4/2014	3.47	0.89				5.75	9.22	6.64				-	Stick Up		MW	
U-4		5/14/2014	4.7	2.12				4.52	9.22	6.64				-	Stick Up		MW	
U-4		10/16/2013	3.28	0.7				5.94	9.22	6.64				-	Stick Up		MW	
U-4		3/28/2013	3.42	0.84				5.8	9.22	6.64				-	Stick Up		MW	
U-4		5/9/2012	4.32	1.74				4.9	9.22	6.64				-	Stick Up		MW	
U-4		5/18/2011	5.65	3.07				3.57	9.22	6.64				-	Stick Up		MW	
U-4		7/29/2010			5.21		<0.01	NA	9.22	6.64				-	Stick Up		MW	
U-4		6/22/2009	5.66	3.08				3.56	9.22	6.64				-	Stick Up		MW	
U-4		11/25/2008	3.21	0.63				6.01	9.22	6.64				-	Stick Up		MW	
U-4		6/6/2008	4.91	2.33				4.31	9.22	6.64				-	Stick Up		MW	
U-4		11/15/2007	3.61	1.03				5.61	9.22	6.64				-	Stick Up		MW	
U-4		6/4/2007	4.16	1.58				5.06	9.22	6.64				-	Stick Up		MW	
U-4		11/7/2006						NA	9.22	6.64				-	Stick Up		MW	
U-4		5/24/2006	3.71	1.13				5.51	9.22	6.64				-	Stick Up		MW	
U-5		5/11/2017	8.17	5.98				1.62	9.79	7.6				-	Stick Up		MW	
U-5		12/1/2016	5.98	3.79				3.81	9.79	7.6				-	Stick Up		MW	
U-5		5/11/2016	7.52	5.33				2.27	9.79	7.6				-	Stick Up		MW	
U-5		11/19/2015	8.9	6.71				0.89	9.79	7.6				-	Stick Up		MW	
U-5		5/15/2015	8.61	6.42				1.18	9.79	7.6				-	Stick Up		MW	
U-5		12/4/2014	6.58	4.39				3.21	9.79	7.6				-	Stick Up		MW	
U-5		5/14/2014	7.52	5.33				2.27	9.79	7.6				-	Stick Up		MW	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
U-5		10/16/2013	7.27	5.08				2.52	9.79	7.6				-	Stick Up		MW	
U-5		3/28/2013	7.61	5.42				2.18	9.79	7.6				-	Stick Up		MW	
U-5		5/9/2012	7.46	5.27				2.33	9.79	7.6				-	Stick Up		MW	
U-5		5/19/2011	7.09	4.9				2.7	9.79	7.6				-	Stick Up		MW	
U-5		7/29/2010						NA	9.79	7.6				-	Stick Up		MW	
U-5		6/22/2009	5.32	3.13				4.47	9.79	7.6				-	Stick Up		MW	
U-5		11/25/2008	5.3	3.11				4.49	9.79	7.6				-	Stick Up		MW	
U-5		6/6/2008	5.11	2.92				4.68	9.79	7.6				-	Stick Up		MW	
U-5		11/15/2007	5.21	3.02				4.58	9.79	7.6				-	Stick Up		MW	
U-5		6/4/2007	6.97	4.78				2.82	9.79	7.6				-	Stick Up		MW	
U-5		11/7/2006						NA	9.79	7.6				-	Stick Up		MW	
U-5		5/24/2006	6.73	4.54				3.06	9.79	7.6				-	Stick Up		MW	
URS-1	B-132U	5/11/2017	5.75					4.27	10.02					-			MW	
URS-1	B-132U	8/19/2016						3.34	10.02					-			MW	
URS-1	B-132U	5/11/2016	5.68					4.34	10.02					-			MW	
URS-1	B-132U	5/9/2016	5.39					4.63	10.02					-			MW	
URS-1	B-132U	5/15/2015	7.42					2.6	10.02					-			MW	
URS-1	B-132U	12/4/2014	5.82					4.2	10.02					-			MW	
URS-1	B-132U	5/15/2014	5.79					4.23	10.02					-			MW	
URS-1	B-132U	10/16/2013	5.52					4.5	10.02					-			MW	
URS-1	B-132U	3/28/2013	6.07					3.95	10.02					-			MW	
URS-1	B-132U	5/9/2012	5.9					4.12	10.02					-			MW	
URS-1	B-132U	5/18/2011	6.08					3.94	10.02					-			MW	
URS-1	B-132U	7/30/2010						NA	10.02					-			MW	
URS-1	B-132U	6/22/2009	5.39					4.63	10.02					-			MW	
URS-1	B-132U	3/23/2009	6.95					3.07	10.02					-			MW	
URS-1	B-132U	11/25/2008	5.96					4.06	10.02					-			MW	
URS-1	B-132U	6/6/2008	6.55					3.47	10.02					-			MW	
URS-1	B-132U	11/15/2007	6.05					3.97	10.02					-			MW	
URS-1	B-132U	6/4/2007	6.14					3.88	10.02					-			MW	
URS-1	B-132U	11/7/2006						NA	10.02					-			MW	
URS-1	B-132U	5/24/2006	6.07					3.95	10.02					-			MW	
URS-2	B-133U	5/11/2017	3.99					3.9	7.89					-			MW	Unable to l
URS-2	B-133U	5/11/2016	3.83					4.06	7.89					-			MW	Unable to l
URS-2	B-133U	5/15/2015	4.61					3.28	7.89					-			MW	Unable to l
URS-2	B-133U	12/4/2014	4.28					3.61	7.89					-			MW	Unable to l
URS-2	B-133U	5/14/2014	3.73					4.16	7.89					-			MW	Unable to l
URS-2	B-133U	10/16/2013	4.48					3.41	7.89					-			MW	Unable to l
URS-2	B-133U	3/28/2013	4.44					3.45	7.89					-			MW	Unable to l
URS-2	B-133U	5/9/2012	4.45					3.44	7.89					-			MW	Unable to l
URS-2	B-133U	5/19/2011	4.03					3.86	7.89					-			MW	Unable to l
URS-2	B-133U	11/25/2008						NA	7.89					-			MW	Unable to l
URS-2	B-133U	6/6/2008	1.95					5.94	7.89					-			MW	Unable to l
URS-2	B-133U	11/15/2007	4.46					3.43	7.89					-			MW	Unable to l
URS-2	B-133U	6/4/2007	4.75					3.14	7.89					-			MW	Unable to l
URS-2	B-133U	11/7/2006						NA	7.89					-			MW	Unable to l
URS-2	B-133U	5/24/2006	4.69					3.2	7.89					-			MW	Unable to l
URS-3	B-134U	5/11/2017	4.12		4.12		<0.01	3.48811	7.6		18	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			MW	
URS-3	B-134U	8/19/2016						3.4	7.6		18			-			MW	
URS-3	B-134U	5/11/2016	3.99					3.61	7.6		18			-			MW	
URS-3	B-134U	5/9/2016	3.9					3.7	7.6		18			-			MW	
URS-3	B-134U	5/15/2015	4.53					3.07	7.6		18			-			MW	
URS-3	B-134U	12/4/2014	4.38					3.22	7.6		18			-			MW	
URS-3	B-134U	5/14/2014	3.98					3.62	7.6		18			-			MW	
URS-3	B-134U	10/16/2013	4.15					3.45	7.6		18			-			MW	
URS-3	B-134U	7/12/2013	3.72					3.88	7.6		18			-			MW	
URS-3	B-134U	3/28/2013	4.05					3.55	7.6		18			-			MW	

Table 3

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URS-3	B-134U	5/9/2012	3.78		3.78		<0.01	3.83	7.6		18	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			MW	
URS-3	B-134U	5/18/2011	3.96		3.96		<0.01	3.65	7.6		18	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			MW	
URS-3	B-134U	7/29/2010						NA	7.6		18			-			MW	
URS-3	B-134U	6/22/2009	3.5					4.1	7.6		18			-			MW	
URS-3	B-134U	11/25/2008	4.35					3.25	7.6		18			-			MW	
URS-3	B-134U	6/6/2008	3.98					3.62	7.6		18			-			MW	
URS-3	B-134U	11/15/2007	4.52					3.08	7.6		18			-			MW	
URS-3	B-134U	6/4/2007	11.35					-3.75	7.6		18			-			MW	
URS-3	B-134U	11/7/2006						NA	7.6		18			-			MW	
URS-3	B-134U	5/24/2006	4.18					3.42	7.6		18			-			MW	
URS-4	B-135U	5/11/2017	9.96					-0.019	9.941					-			MW	
URS-4	B-135U	8/19/2016						2.421	9.941					-			MW	
URS-4	B-135U	5/11/2016	9.09					0.85	9.941					-			MW	
URS-4	B-135U	5/9/2016	8.45					1.491	9.941					-			MW	
URS-4	B-135U	5/15/2015	7.74					2.2	9.941					-			MW	
URS-4	B-135U	12/4/2014	7.5					2.44	9.941					-			MW	
URS-4	B-135U	5/15/2014	7.2					2.74	9.941					-			MW	
URS-4	B-135U	10/16/2013	6.59					3.35	9.941					-			MW	
URS-4	B-135U	3/28/2013	10.53					-0.59	9.941					-			MW	
URS-4	B-135U	5/9/2012	9.63					0.31	9.941					-			MW	
URS-4	B-135U	5/18/2011	7.81					2.13	9.941					-			MW	
URS-4	B-135U	7/30/2010						NA	9.941					-			MW	
URS-4	B-135U	6/22/2009	8.84					1.1	9.941					-			MW	
URS-4	B-135U	3/23/2009	7.06					2.88	9.941					-			MW	
URS-4	B-135U	11/25/2008	6.98					2.96	9.941					-			MW	
URS-4	B-135U	6/6/2008	9.75					0.19	9.941					-			MW	
URS-4	B-135U	11/15/2007	8.32					1.62	9.941					-			MW	
URS-4	B-135U	6/4/2007	7.88					2.06	9.941					-			MW	
URS-4	B-135U	11/7/2006						NA	9.941					-			MW	
URS-4	B-135U	5/24/2006	7.35					2.59	9.941					-			MW	
URS-5	B-136U	5/11/2017	5.3					2.64	7.94		14			-			MW	
URS-5	B-136U	8/19/2016						2.65	7.94		14			-			MW	
URS-5	B-136U	5/11/2016	5.11		5.11		<0.01	2.84	7.94		14	B-39	0.8734	98% MIDDLE DISTILLATE, 2% GASOLINE			MW	
URS-5	B-136U	5/10/2016	5.15					2.79	7.94		14			-			MW	
URS-5	B-136U	5/15/2015	5.52					2.42	7.94		14			-			MW	
URS-5	B-136U	12/4/2014	5.23					2.71	7.94		14			-			MW	
URS-5	B-136U	5/14/2014	5.22					2.72	7.94		14			-			MW	
URS-5	B-136U	10/16/2013	5.18					2.76	7.94		14			-			MW	
URS-5	B-136U	3/28/2013	5					2.94	7.94		14			-			MW	
URS-5	B-136U	5/9/2012	5.25					2.69	7.94		14			-			MW	
URS-5	B-136U	5/18/2011	5.26					2.68	7.94		14			-			MW	
URS-5	B-136U	7/29/2010						NA	7.94		14			-			MW	
URS-5	B-136U	6/22/2009	4.87					3.07	7.94		14			-			MW	
URS-5	B-136U	3/23/2009	5.64					2.3	7.94		14			-			MW	
URS-5	B-136U	11/25/2008	5.26					2.68	7.94		14			-			MW	
URS-5	B-136U	6/6/2008	5.36					2.58	7.94		14			-			MW	
URS-5	B-136U	11/15/2007	5.32					2.62	7.94		14			-			MW	
URS-5	B-136U	6/4/2007	5.3					2.64	7.94		14			-			MW	
URS-5	B-136U	11/7/2006						NA	7.94		14			-			MW	
URS-5	B-136U	5/24/2006	5.37					2.57	7.94		14			-			MW	
WP16-2		11/25/2008						NA		13.59				-				
WP16-2		6/6/2008						NA		13.59				-				
WP16-2		11/15/2007						NA		13.59				-				
WP16-2		6/4/2007						NA		13.59				-				

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WP16-2		11/7/2006						NA		13.59				-				
WP16-2		5/24/2006						NA		13.59				-				
WP16-2		5/19/2005						NA		13.59				-				
WP16-2		10/8/2004						NA		13.59				-				
WP16-2		9/17/2004	8.76					NA		13.59				-				
WP16-2		6/28/2004						NA		13.59				-				
WP16-2		3/3/2004						NA		13.59				-				
WP16-2		11/25/2003						NA		13.59				-				
WP16-2		11/18/2003						NA		13.59				-				
WP16-2		8/27/2003						NA		13.59				-				
WP16-2		7/7/2003						NA		13.59				-				
WP16-2		3/12/2003						NA		13.59				-				
WP16-2		8/12/2002						NA		13.59				-				
WP16-2		6/14/2002						NA		13.59				-				
WP16-2		2/19/2002						NA		13.59				-				
WP16-2		11/8/2001						NA		13.59				-				
WP16-2		6/13/2001						NA		13.59				-				
WP16-2		2/19/2001	4.72					NA		13.59				-				
WP16-2		11/14/2000	8.35					NA		13.59				-				
WP16-2		9/6/2000	7.41					NA		13.59				-				
WP16-2		6/16/2000	7.42					NA		13.59				-				
WP16-2		3/9/2000	8.26					NA		13.59				-				
WP16-2		11/18/1999	8.09					NA		13.59				-				
WP16-2		9/24/1999	7.09					NA		13.59				-				
WP16-2		9/9/1999	7.74					NA		13.59				-				
WP16-2		8/27/1999	8.28					NA		13.59				-				
WP16-2		8/12/1999	8.58					NA		13.59				-				
WP16-2		7/30/1999	8.21					NA		13.59				-				
WP16-2		7/13/1999	8.16					NA		13.59				-				
WP16-2		6/30/1999	8.01					NA		13.59				-				
WP16-2		6/15/1999	7.89					NA		13.59				-				
WP16-2		6/2/1999	7.62					NA		13.59				-				
WP16-2		5/20/1999	7.75					NA		13.59				-				
WP16-2		5/4/1999	7.74					NA		13.59				-				
WP16-2		4/20/1999	7.62					NA		13.59				-				
WP16-2		4/12/1999	7.67					NA		13.59				-				
WP16-2		3/25/1999	7.93					NA		13.59				-				
WP16-2		3/11/1999	8.14					NA		13.59				-				
WP16-2		3/2/1999	8.14					NA		13.59				-				
WP16-2		2/9/1999	8.25					NA		13.59				-				
WP16-2		1/29/1999	8.82					NA		13.59				-				
WP16-2		1/15/1999	9.19					NA		13.59				-				
WP16-2		12/30/1998	9.15					NA		13.59				-				
WP16-2		12/17/1998	8.96					NA		13.59				-				
WP16-2		12/4/1998	8.98					NA		13.59				-				
WP16-2		11/20/1998	8.93					NA		13.59				-				
WP16-2		11/4/1998	8.78					NA		13.59				-				
WP16-2		10/23/1998	8.51					NA		13.59				-				
WP16-2		10/9/1998	8.65					NA		13.59				-				
WP16-2		9/25/1998	8.35					NA		13.59				-				
WP16-2		9/10/1998	8.32					NA		13.59				-				
WP16-2		8/28/1998	8.14					NA		13.59				-				
WP16-2		8/13/1998	8.19					NA		13.59				-				
WP16-2		7/31/1998	8.06					NA		13.59				-				
WP16-2		7/16/1998	7.8					NA		13.59				-				
WP16-2		7/2/1998	7.67					NA		13.59				-				
WP16-2		6/19/1998	7.49					NA		13.59				-				
WP16-2		6/5/1998	7.69					NA		13.59				-				
WP16-2		5/21/1998	7.39					NA		13.59				-				
WP16-2		4/23/1998	7.41					NA		13.59				-				

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP16-2		4/10/1998	7.61					NA		13.59				-				
WP16-2		3/27/1998	7.59					NA		13.59				-				
WP16-2		3/12/1998	7.55					NA		13.59				-				
WP16-2		2/27/1998	7.58					NA		13.59				-				
WP16-2		2/10/1998	7.91					NA		13.59				-				
WP16-2		1/30/1998	7.6					NA		13.59				-				
WP16-2		1/16/1998	7.86					NA		13.59				-				
WP16-2		12/19/1997	8.63					NA		13.59				-				
WP16-2		12/4/1997	8.24					NA		13.59				-				
WP16-2		11/21/1997	8.19					NA		13.59				-				
WP16-2		11/7/1997	8.19					NA		13.59				-				
WP16-2		10/24/1997	8.61					NA		13.59				-				
WP16-2		10/10/1997	8.41					NA		13.59				-				
WP16-2		9/26/1997	7.93					NA		13.59				-				
WP16-2		9/12/1997	7.79		7.79		<0.01	NA		13.59				-				
WP16-2		8/28/1997	7.9		7.87		0.03	NA		13.59				-				
WP16-2		8/15/1997	7.88		7.86		0.02	NA		13.59				-				
WP16-2		8/1/1997	7.84		7.82		0.02	NA		13.59				-				
WP16-2		7/17/1997	8.01					NA		13.59				-				
WP16-2		7/1/1997	7.86		7.86		<0.01	NA		13.59				-				
WP16-2		6/20/1997	7.83		7.8		0.03	NA		13.59				-				
WP16-2		6/3/1997	7.63		7.63		<0.01	NA		13.59				-				
WP16-2		5/22/1997	8.05		8.05		<0.01	NA		13.59				-				
WP16-2		5/9/1997	7.51					NA		13.59				-				
WP16-2		4/24/1997	7.6		7.6		<0.01	NA		13.59				-				
WP16-2		4/11/1997	7.62		7.62		<0.01	NA		13.59				-				
WP16-5		11/25/2008						NA	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/6/2008						NA	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/15/2007						NA	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/4/2007						NA	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/7/2006						NA	13.57		10.5			-			Temporary	Destroyed
WP16-5		5/24/2006						NA	13.57		10.5			-			Temporary	Destroyed
WP16-5		5/19/2005	7.25					6.32	13.57		10.5			-			Temporary	Destroyed
WP16-5		10/8/2004	6.67					6.9	13.57		10.5			-			Temporary	Destroyed
WP16-5		9/17/2004	6.95					6.62	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/28/2004	6.71					6.86	13.57		10.5			-			Temporary	Destroyed
WP16-5		3/3/2004	7.61					5.96	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/25/2003	6.72					6.85	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/18/2003	6.7					6.87	13.57		10.5			-			Temporary	Destroyed
WP16-5		8/27/2003	6.82					6.75	13.57		10.5			-			Temporary	Destroyed
WP16-5		7/7/2003	6.73					6.84	13.57		10.5			-			Temporary	Destroyed
WP16-5		3/12/2003	6.5					7.07	13.57		10.5			-			Temporary	Destroyed
WP16-5		10/31/2002	6.23					7.34	13.57		10.5			-			Temporary	Destroyed
WP16-5		8/12/2002	7.28					6.29	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/14/2002	6.63					6.94	13.57		10.5			-			Temporary	Destroyed
WP16-5		2/19/2002	7.8					5.77	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/8/2001	8.4					5.17	13.57		10.5			-			Temporary	Destroyed
WP16-5		9/5/2001	7.81					5.76	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/13/2001	6.68					6.89	13.57		10.5			-			Temporary	Destroyed
WP16-5		2/19/2001	6.8					6.77	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/14/2000	7.54					6.03	13.57		10.5			-			Temporary	Destroyed
WP16-5		9/6/2000	6.44					7.13	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/16/2000	6.56					7.01	13.57		10.5			-			Temporary	Destroyed
WP16-5		3/9/2000	7.28					6.29	13.57		10.5			-			Temporary	Destroyed
WP16-5		11/18/1999	7.42					6.15	13.57		10.5			-			Temporary	Destroyed
WP16-5		9/24/1999	6.06					7.51	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/15/1999	7.1					6.47	13.57		10.5			-			Temporary	Destroyed
WP16-5		3/11/1999	6.82					6.75	13.57		10.5			-			Temporary	Destroyed
WP16-5		12/17/1998	8.22					5.35	13.57		10.5			-			Temporary	Destroyed
WP16-5		9/10/1998	7.23					6.34	13.57		10.5			-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP16-5		6/19/1998	6.4					7.17	13.57		10.5			-			Temporary	Destroyed
WP16-5		3/27/1998	6.55					7.02	13.57		10.5			-			Temporary	Destroyed
WP16-5		12/19/1997	7.47					6.1	13.57		10.5			-			Temporary	Destroyed
WP16-5		9/26/1997	7.24					6.33	13.57		10.5			-			Temporary	Destroyed
WP16-5		7/17/1997	5.41					8.16	13.57		10.5			-			Temporary	Destroyed
WP16-5		7/1/1997	5.44					8.13	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/20/1997	5.47					8.1	13.57		10.5			-			Temporary	Destroyed
WP16-5		6/3/1997	5.23					8.34	13.57		10.5			-			Temporary	Destroyed
WP16-5		5/22/1997	5.31					8.26	13.57		10.5			-			Temporary	Destroyed
WP16-5		5/9/1997	5.18					8.39	13.57		10.5			-			Temporary	Destroyed
WP16-5		4/24/1997	5.25					8.32	13.57		10.5			-			Temporary	Destroyed
WP16-5		4/11/1997	5.35					8.22	13.57		10.5			-			Temporary	Destroyed
WP9-1		11/25/2008						NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/18/2008						NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/6/2008						NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/31/2008						NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/15/2007						NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/18/2007						NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/4/2007						NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/2/2007						NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/7/2006						NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/29/2006						NA		7.9	9			-			Temporary	Destroyed
WP9-1		5/24/2006						NA		7.9	9			-			Temporary	Destroyed
WP9-1		2/8/2006						NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/1/2005						4.83		7.9	9			-			Temporary	Destroyed
WP9-1		5/19/2005	2.74					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/9/2005	1.93					NA		7.9	9			-			Temporary	Destroyed
WP9-1		10/8/2004	3.08					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/17/2004	3.01					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/25/2004	2.49					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/3/2004	2.86					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/25/2003	2					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/18/2003	2					NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/27/2003	2.07					NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/7/2003						NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/12/2003	1.98					NA		7.9	9			-			Temporary	Destroyed
WP9-1		10/31/2002						NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/12/2002	2.77					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/14/2002	1.99					NA		7.9	9			-			Temporary	Destroyed
WP9-1		2/19/2002	3.08					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/8/2001						NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/19/2001	4.05					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/13/2001	1.99					NA		7.9	9			-			Temporary	Destroyed
WP9-1		2/19/2001	2.98					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/14/2000	2.75					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/6/2000	2.35		2.35		<0.01	NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/16/2000	2.56					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/9/2000	2.4					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/18/1999	2.88					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/24/1999	1.01					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/9/1999	1.98		1.98		<0.01	NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/27/1999	2.18					NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/12/1999	3.57					NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/30/1999						NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/16/1999	2.75					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/30/1999	2.52					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/15/1999	2.39					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/2/1999	1.8					NA		7.9	9			-			Temporary	Destroyed
WP9-1		5/19/1999	2.34					NA		7.9	9			-			Temporary	Destroyed
WP9-1		5/4/1999	2.19					NA		7.9	9			-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-1		4/20/1999	2.65					NA		7.9	9			-			Temporary	Destroyed
WP9-1		4/12/1999	2.69					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/29/1999	2.41					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/11/1999	3.15					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/2/1999	3.11					NA		7.9	9			-			Temporary	Destroyed
WP9-1		2/10/1999	2.37					NA		7.9	9			-			Temporary	Destroyed
WP9-1		1/29/1999	2.85					NA		7.9	9			-			Temporary	Destroyed
WP9-1		1/15/1999	2.71					NA		7.9	9			-			Temporary	Destroyed
WP9-1		12/29/1998	3.93					NA		7.9	9			-			Temporary	Destroyed
WP9-1		12/16/1998	4.21					NA		7.9	9			-			Temporary	Destroyed
WP9-1		12/1/1998	4.31					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/20/1998	4.13					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/4/1998	3.72					NA		7.9	9			-			Temporary	Destroyed
WP9-1		10/23/1998	3.93					NA		7.9	9			-			Temporary	Destroyed
WP9-1		10/9/1998	3.97					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/25/1998	3.05					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/11/1998	2.95					NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/28/1998	2.83					NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/14/1998	2.93					NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/31/1998	2.93					NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/16/1998	2.85					NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/2/1998	2.66					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/19/1998	2.16					NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/5/1998	2.15					NA		7.9	9			-			Temporary	Destroyed
WP9-1		5/20/1998	1.98					NA		7.9	9			-			Temporary	Destroyed
WP9-1		4/23/1998	1.83					NA		7.9	9			-			Temporary	Destroyed
WP9-1		4/10/1998	2.03					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/27/1998	2.02					NA		7.9	9			-			Temporary	Destroyed
WP9-1		3/12/1998	2.32					NA		7.9	9			-			Temporary	Destroyed
WP9-1		2/27/1998	2.37					NA		7.9	9			-			Temporary	Destroyed
WP9-1		2/10/1998	2.58					NA		7.9	9			-			Temporary	Destroyed
WP9-1		1/30/1998	2.34					NA		7.9	9			-			Temporary	Destroyed
WP9-1		1/16/1998	2.85					NA		7.9	9			-			Temporary	Destroyed
WP9-1		12/19/1997	3.18					NA		7.9	9			-			Temporary	Destroyed
WP9-1		12/4/1997	2.84					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/21/1997	3.56					NA		7.9	9			-			Temporary	Destroyed
WP9-1		11/7/1997	3.67					NA		7.9	9			-			Temporary	Destroyed
WP9-1		10/24/1997	4.32					NA		7.9	9			-			Temporary	Destroyed
WP9-1		10/10/1997	3.89					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/24/1997	3.36					NA		7.9	9			-			Temporary	Destroyed
WP9-1		9/12/1997	2.93					NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/28/1997	3.31		3.29		0.02	NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/14/1997	3.86		3.86		<0.01	NA		7.9	9			-			Temporary	Destroyed
WP9-1		8/1/1997	3.49		3.42		0.07	NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/17/1997	4.43		4.06		0.37	NA		7.9	9			-			Temporary	Destroyed
WP9-1		7/1/1997	3.49		3.44		0.05	NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/20/1997	3.8		3.51		0.29	NA		7.9	9			-			Temporary	Destroyed
WP9-1		6/2/1997	2.7		2.62		0.08	NA		7.9	9			-			Temporary	Destroyed
WP9-1		5/22/1997	3.26		3.08		0.18	NA		7.9	9			-			Temporary	Destroyed
WP9-1		5/9/1997	2.49		2.44		0.05	NA		7.9	9			-			Temporary	Destroyed
WP9-1		4/22/1997	1.93		1.74		0.19	NA		7.9	9			-			Temporary	Destroyed
WP9-1		4/11/1997	2.24		2.07		0.17	NA		7.9	9			-			Temporary	Destroyed
WP9-2		11/25/2008						NA	6.01		10.5			-			Temporary	Unable to l
WP9-2		8/18/2008						NA	6.01		10.5			-			Temporary	Unable to l
WP9-2		6/6/2008						NA	6.01		10.5			-			Temporary	Unable to l
WP9-2		3/31/2008						NA	6.01		10.5			-			Temporary	Unable to l
WP9-2		11/15/2007	3.33		2.25		1.08	3.56	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		9/18/2007	4.35		3.32		1.03	2.5	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/4/2007	4.25		1.82		2.43	3.73	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/2/2007	4.43		3.32		1.11	2.48	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/7/2006			2.04		1.65	NA	6.01		10.5			-			Temporary	Unable to l
WP9-2		8/29/2006	3.28		2.19		1.09	3.61	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/24/2006	4.17		1.99		2.18	3.61	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/8/2006			1.9		2.12	5.71	6.01		10.5			-			Temporary	Unable to l
WP9-2		7/1/2005			2.88		1.41	4.86	6.01		10.5			-			Temporary	Unable to l
WP9-2		5/19/2005	4.25		2.67		1.58	3.04	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/9/2005	4.21		1.85		2.36	3.71	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/8/2004	3.64		1.74		1.9	3.91	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/17/2004	4.39		3.05		1.34	2.71	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/2/2004	4.45		2.22		2.23	3.37	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/25/2004	4.41		2.46		1.95	3.18	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/10/2004	4.18		1.35		2.83	4.13	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/28/2004	4.3		1.52		2.78	3.97	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/12/2004	4.35		1.58		2.77	3.91	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/29/2004	4.31		1.85		2.46	3.7	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/15/2004	4.12		1.38		2.74	4.11	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/2/2004	4.14		1.49		2.65	4.02	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/17/2004	4.11		2.2		1.91	3.45	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/3/2004	4.31		2.78		1.53	2.94	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		2/17/2004	4.05		2.36		1.69	3.33	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/3/2004	4.06		3.61		0.45	2.32	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/6/2004	4.21		2.18		2.03	3.45	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/22/2003	3.39		1.51		1.88	4.15	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/25/2003	3.96		2.13		1.83	3.53	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/18/2003	4.03		2.1		1.93	3.55	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/5/2003	3.04		1.35		1.69	4.34	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/22/2003	3.33		2.04		1.29	3.73	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/7/2003	3.57		2.34		1.23	3.44	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/24/2003	3.72		1.65		2.07	3.97	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/8/2003	3.76		2.08		1.68	3.61	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/27/2003	4.03		1.98		2.05	3.64	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/12/2003	4.2		1.73		2.47	3.81	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/18/2003	3.65		1.76		1.89	3.89	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/7/2003						NA	6.01		10.5			-			Temporary	Unable to l
WP9-2		6/30/2003	2.47		1.25		1.22	4.53	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/17/2003	3.5		1.05		2.45	4.5	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/2/2003	4		1.37		2.63	4.14	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/20/2003	3.84		1.89		1.95	3.75	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/8/2003	3.85		1.74		2.11	3.87	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		4/25/2003	3.5		1.64		1.86	4.02	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/9/2003	3.2		1.49		1.71	4.2	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/26/2003	3.48		1.7		1.78	3.97	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/12/2003	3.7		2.09		1.61	3.62	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/27/2003	2.91		1.64		1.27	4.13	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/13/2003	3.75		2.97		0.78	2.89	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/28/2003	3.96		3.05		0.91	2.79	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/24/2003	4.3		2.9		1.4	2.85	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/30/2002	2.82		1.88		0.94	3.95	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/19/2002	4.05		3.09		0.96	2.74	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/4/2002	3.81		2.79		1.02	3.03	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/18/2002	2.41		1.45		0.96	4.38	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/31/2002	1.76		1.41		0.35	4.53	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/18/2002	2.35		1.86		0.49	4.06	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/4/2002	2.76		2.16		0.6	3.74	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/17/2002	3.32		2.51		0.81	3.35	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/4/2002	2.48		2.27		0.21	3.7	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/12/2002	3.7		2.61		1.09	3.19	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/22/2002	3.59		2.26		1.33	3.5	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/27/2002	3.63		2.01		1.62	3.69	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		6/14/2002	3.25		2.01		1.24	3.77	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/31/2002	3.59		2.15		1.44	3.59	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/15/2002	3.68		2.01		1.67	3.69	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/1/2002	3.05		1.95		1.1	3.85	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/19/2002	3.19		2.01		1.18	3.78	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/2/2002	2.88		2.05		0.83	3.8	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/19/2002	3.5		2.57		0.93	3.26	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/5/2002	3.78		3.08		0.7	2.8	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/19/2002	3.77		3.07		0.7	2.81	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/7/2002	3.65		3.14		0.51	2.77	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/21/2002	3.31		2.97		0.34	2.98	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/9/2002	3.29		2.99		0.3	2.96	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/11/2001	3.93		3.16		0.77	2.7	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/8/2001	3.69		3.69		<0.01	2.33	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/31/2001	4.15		3.42		0.73	2.45	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/17/2001	4.32		3.04		1.28	2.73	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/2/2001	4.31		3.33		0.98	2.5	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/19/2001	4.41		4.16		0.25	1.8	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/5/2001	4.91		4.56		0.35	1.38	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/21/2001	4.4		4.06		0.34	1.89	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		8/9/2001	4.48		4.01		0.47	1.91	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/26/2001	4.39		2.92		1.47	2.81	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/10/2001	4.13		2.15		1.98	3.49	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/13/2001	4.39		1.85		2.54	3.68	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/29/2001	4.3		2.35		1.95	3.29	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/17/2001	4.37		3.18		1.19	2.61	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/3/2001	4.23		2.21		2.02	3.42	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/16/2001	4.53		2.18		2.35	3.39	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/6/2001	4.17		2.3		1.87	3.36	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/20/2001	4.02		1.58		2.44	3.97	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/6/2001	4		2.2		1.8	3.47	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/19/2001	4.46		3.35		1.11	2.45	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/6/2001	4.28		2.92		1.36	2.83	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/23/2001	3.84		3.36		0.48	2.56	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/9/2001	4.41		3.56		0.85	2.29	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/12/2000	3.84		2.86		0.98	2.97	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/28/2000	3.9		2.79		1.11	3.01	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/14/2000	3.82		2.76		1.06	3.05	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/31/2000	4.25		2.71		1.54	3.01	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/18/2000	4.09		2.45		1.64	3.25	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		10/2/2000	4.51		2.08		2.43	3.47	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/19/2000	4.28		1.97		2.31	3.6	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/6/2000	4.43		2.37		2.06	3.25	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/23/2000	4.35		2.68		1.67	3.02	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/9/2000	4.43		1.87		2.56	3.66	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/25/2000	4.72		3.05		1.67	2.65	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/11/2000	5.03		3.21		1.82	2.46	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/27/2000	4.83		2.44		2.39	3.12	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/16/2000	4.87		2.75		2.12	2.86	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/1/2000	4.77		2.76		2.01	2.87	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/19/2000	4.83		2.75		2.08	2.87	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/4/2000	4.71		2.86		1.85	2.8	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/20/2000	4.37		2.01		2.36	3.55	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/5/2000	4.69		2.07		2.62	3.45	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/22/2000	3.98		2.33		1.65	3.37	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/9/2000	4.41		2.24		2.17	3.36	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/24/2000	4.43		2.11		2.32	3.46	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/11/2000	4.49		2.56		1.93	3.09	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/26/2000	4.66		3.41		1.25	2.36	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/14/2000	4.58		2.97		1.61	2.74	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		12/30/1999	4.57		2.9		1.67	2.8	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/16/1999	4.32		1.66		2.66	3.85	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/6/1999	4.19		2.38		1.81	3.29	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/1/1999	4.35		2.5		1.85	3.16	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/18/1999	4.4		2.98		1.42	2.76	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/4/1999	5.45		2.38		3.07	3.05	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/19/1999	4.56		2.35		2.21	3.24	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/7/1999	4.51		1.99		2.52	3.54	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/24/1999	3.03		0.76		2.27	4.82	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/9/1999	4.09		2.01		2.08	3.61	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/27/1999	4.03		2.45		1.58	3.26	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/12/1999	4.75		3.68		1.07	2.13	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/30/1999	4.86		3.46		1.4	2.29	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/16/1999	4.63		2.69		1.94	2.95	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/30/1999	4.89		2.63		2.26	2.95	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/15/1999	4.84		2.46		2.38	3.1	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/2/1999	4.66		1.59		3.07	3.84	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/19/1999	4.75		2.09		2.66	3.42	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/4/1999	2.7		1.94		0.76	3.93	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/20/1999	4.54		2		2.54	3.53	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		4/12/1999	4.46		2.08		2.38	3.48	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/29/1999	4.47		1.79		2.68	3.71	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/11/1999	4.75		2.9		1.85	2.76	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/2/1999	5.02		3.1		1.92	2.55	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/10/1999	4.12		2.25		1.87	3.41	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/29/1999	5.1		2.77		2.33	2.8	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/15/1999	3.69		3.18		0.51	2.73	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/29/1998	4.5		3.68		0.82	2.18	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/16/1998	4.65		3.96		0.69	1.92	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/1/1998	4.77		4.22		0.55	1.69	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/20/1998	4.72		4.14		0.58	1.76	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/4/1998	4.61		3.68		0.93	2.15	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/23/1998	4.72		4.03		0.69	1.85	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/9/1998	4.69		4.11		0.58	1.79	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/25/1998	4.54		3		1.54	2.72	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/11/1998	4.44		2.81		1.63	2.89	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/28/1998	4.58		2.51		2.07	3.11	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/14/1998	4.61		2.64		1.97	3	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/31/1998	4.69		2.72		1.97	2.92	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/16/1998	4.89		2.87		2.02	2.76	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		7/2/1998	5.08		2.46		2.62	3.06	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/19/1998	4.77		1.73		3.04	3.71	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/5/1998	4.67		1.79		2.88	3.68	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/20/1998	4.48		1.34		3.14	4.08	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/23/1998	4.54		1.26		3.28	4.13	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/10/1998	4.73		1.65		3.08	3.78	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/27/1998	4.65		1.52		3.13	3.9	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		3/12/1998	4.48		1.79		2.69	3.71	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/27/1998	4.66		2.18		2.48	3.36	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		2/10/1998	4.65		2.42		2.23	3.17	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/30/1998	4.56		2.01		2.55	3.52	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		1/16/1998	4.31		2.68		1.63	3.02	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/19/1997	4.49		3.1		1.39	2.65	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		12/4/1997	4.35		2.61		1.74	3.07	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/21/1997	4.62		3.51		1.11	2.29	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		11/7/1997	4.74		3.54		1.2	2.24	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/24/1997	5.01		4.38		0.63	1.51	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		10/10/1997	4.93		3.86		1.07	1.95	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/24/1997	4.81		3.13		1.68	2.56	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		9/12/1997	4.48		2.67		1.81	3	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-2		8/28/1997	4.95		3.26		1.69	2.43	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/14/1997	5.28		3.89		1.39	1.86	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		8/1/1997	5.04		3.57		1.47	2.16	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/17/1997	5.25		4.19		1.06	1.62	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		7/1/1997	4.95		3.41		1.54	2.31	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/20/1997	5.39		3.45		1.94	2.19	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		6/2/1997	4.71		2.46		2.25	3.13	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/22/1997	5.12		2.96		2.16	2.64	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		5/9/1997	4.98		2.23		2.75	3.26	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/22/1997	4.42		1.55		2.87	3.92	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-2		4/11/1997	4.79		1.84		2.95	3.61	6.01		10.5	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Unable to l
WP9-3		5/17/2017	1.8					4.36	6.16		9			-			Temporary	Damaged
WP9-3		12/1/2016	1.52		1.48		0.04	4.67246	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/11/2016	2.04					4.12	6.16		9			-			Temporary	Damaged
WP9-3		11/19/2015	2.3					3.86	6.16		9			-			Temporary	Damaged
WP9-3		5/15/2015						NA	6.16		9			-			Temporary	Damaged
WP9-3		2/13/2015	2.11					4.05	6.16		9			-			Temporary	Damaged
WP9-3		12/4/2014	1.45					4.71	6.16		9			-			Temporary	Damaged
WP9-3		5/14/2014	2.08					4.08	6.16		9			-			Temporary	Damaged
WP9-3		10/16/2013	1.82					4.34	6.16		9			-			Temporary	Damaged
WP9-3		7/12/2013	1.93					4.23	6.16		9			-			Temporary	Damaged
WP9-3		3/28/2013	1.89		1.89		<0.01	4.28	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/9/2012	1.56					4.6	6.16		9			-			Temporary	Damaged
WP9-3		5/18/2011	1.7					4.46	6.16		9			-			Temporary	Damaged
WP9-3		7/30/2010						NA	6.16		9			-			Temporary	Damaged
WP9-3		6/22/2009	1.14					5.02	6.16		9			-			Temporary	Damaged
WP9-3		11/25/2008	2.13					4.03	6.16		9			-			Temporary	Damaged
WP9-3		8/18/2008	1.3					4.86	6.16		9			-			Temporary	Damaged
WP9-3		6/6/2008						NA	6.16		9			-			Temporary	Damaged
WP9-3		3/31/2008	1.85					4.31	6.16		9			-			Temporary	Damaged
WP9-3		11/15/2007	1.91					4.25	6.16		9			-			Temporary	Damaged
WP9-3		9/18/2007	4.2					1.96	6.16		9			-			Temporary	Damaged
WP9-3		6/4/2007	2.46					3.7	6.16		9			-			Temporary	Damaged
WP9-3		3/2/2007	2.26					3.9	6.16		9			-			Temporary	Damaged

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LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		11/7/2006			3.05		0.39	NA	6.16		9			-			Temporary	Damaged
WP9-3		8/29/2006						NA	6.16		9			-			Temporary	Damaged
WP9-3		5/24/2006	2.66					3.5	6.16		9			-			Temporary	Damaged
WP9-3		2/8/2006						4.63	6.16		9			-			Temporary	Damaged
WP9-3		7/1/2005			3.36		<0.01	3.73	6.16		9			-			Temporary	Damaged
WP9-3		5/19/2005	3.1					3.06	6.16		9			-			Temporary	Damaged
WP9-3		3/9/2005	2.14					4.02	6.16		9			-			Temporary	Damaged
WP9-3		10/8/2004	2.34					3.82	6.16		9			-			Temporary	Damaged
WP9-3		9/17/2004	3.82					2.34	6.16		9			-			Temporary	Damaged
WP9-3		9/2/2004	3.13					3.03	6.16		9			-			Temporary	Damaged
WP9-3		6/25/2004	3.22					2.94	6.16		9			-			Temporary	Damaged
WP9-3		6/10/2004	2.62					3.54	6.16		9			-			Temporary	Damaged
WP9-3		5/28/2004	2.76					3.4	6.16		9			-			Temporary	Damaged
WP9-3		5/12/2004	2.55					3.61	6.16		9			-			Temporary	Damaged
WP9-3		4/29/2004						NA	6.16		9			-			Temporary	Damaged
WP9-3		4/15/2004						NA	6.16		9			-			Temporary	Damaged
WP9-3		4/2/2004	2.07		2.05		0.02	4.11	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/17/2004	2.06		2.04		0.02	4.12	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/3/2004	3.37		3.03		0.34	3.07	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		2/17/2004	3.01		2.67		0.34	3.43	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		2/3/2004	4.24		4.23		0.01	1.93	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/6/2004	1.89					4.27	6.16		9			-			Temporary	Damaged
WP9-3		12/22/2003						NA	6.16		9			-			Temporary	Damaged
WP9-3		11/25/2003	2.52					3.64	6.16		9			-			Temporary	Damaged
WP9-3		11/18/2003	2.49					3.67	6.16		9			-			Temporary	Damaged
WP9-3		11/5/2003	1.42					4.74	6.16		9			-			Temporary	Damaged
WP9-3		10/22/2003						NA	6.16		9			-			Temporary	Damaged
WP9-3		10/7/2003	1.66					4.5	6.16		9			-			Temporary	Damaged
WP9-3		9/24/2003	0.98					5.18	6.16		9			-			Temporary	Damaged
WP9-3		9/8/2003	1.64					4.52	6.16		9			-			Temporary	Damaged
WP9-3		8/27/2003	1.85					4.31	6.16		9			-			Temporary	Damaged
WP9-3		8/12/2003	1.21					4.95	6.16		9			-			Temporary	Damaged
WP9-3		7/18/2003	2.25					3.91	6.16		9			-			Temporary	Damaged
WP9-3		7/7/2003	1.98		1.97		0.01	4.19	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/30/2003	1.79					4.37	6.16		9			-			Temporary	Damaged
WP9-3		6/17/2003	2.06					4.1	6.16		9			-			Temporary	Damaged
WP9-3		6/2/2003	1.62					4.54	6.16		9			-			Temporary	Damaged
WP9-3		5/20/2003	2.31					3.85	6.16		9			-			Temporary	Damaged
WP9-3		5/8/2003	2.64					3.52	6.16		9			-			Temporary	Damaged
WP9-3		4/25/2003	2.55					3.61	6.16		9			-			Temporary	Damaged
WP9-3		4/9/2003	2.04					4.12	6.16		9			-			Temporary	Damaged
WP9-3		3/26/2003	2.49					3.67	6.16		9			-			Temporary	Damaged
WP9-3		3/12/2003	2.26					3.9	6.16		9			-			Temporary	Damaged
WP9-3		2/27/2003						NA	6.16		9			-			Temporary	Damaged
WP9-3		2/13/2003	2.06		2.06		<0.01	4.11	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/28/2003	3.58					2.58	6.16		9			-			Temporary	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		1/24/2003	3.51					2.65	6.16		9			-			Temporary	Damaged
WP9-3		12/30/2002	1.96					4.2	6.16		9			-			Temporary	Damaged
WP9-3		12/19/2002	2.73					3.43	6.16		9			-			Temporary	Damaged
WP9-3		12/4/2002	2.38					3.78	6.16		9			-			Temporary	Damaged
WP9-3		11/18/2002						NA	6.16		9			-			Temporary	Damaged
WP9-3		10/31/2002	1.6					4.56	6.16		9			-			Temporary	Damaged
WP9-3		10/18/2002	1.82		1.76		0.06	4.39	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		10/4/2002	2.36		2.34		0.02	3.82	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/17/2002	2.86					3.3	6.16		9			-			Temporary	Damaged
WP9-3		9/4/2002	2.37		2.36		0.01	3.8	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/12/2002	3.94		3.65		0.29	2.46	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/22/2002	3.8		3.28		0.52	2.78	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/27/2002	3.48		2.82		0.66	3.22	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/14/2002	3.3		2.95		0.35	3.14	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/31/2002	3.53		3.11		0.42	2.97	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/15/2002	3.06		2.92		0.14	3.21	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/1/2002	2.88		2.7		0.18	3.43	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/19/2002	3.39		2.88		0.51	3.18	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/2/2002	3.3		2.71		0.59	3.34	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/19/2002	3.33					2.83	6.16		9			-			Temporary	Damaged
WP9-3		3/5/2002	3.77					2.39	6.16		9			-			Temporary	Damaged
WP9-3		2/19/2002	3.76		3.76		<0.01	2.41	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		2/7/2002	5.45					0.71	6.16		9			-			Temporary	Damaged
WP9-3		1/21/2002	4.18		3.3		0.88	2.69	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/9/2002	3.99		3.34		0.65	2.7	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/28/2001	3.53		3.41		0.12	2.73	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/11/2001	3.64					2.52	6.16		9			-			Temporary	Damaged
WP9-3		11/8/2001	6					0.16	6.16		9			-			Temporary	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		10/31/2001	3.92		3.91		0.01	2.25	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		10/17/2001	3.73		3.73		<0.01	2.44	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		10/2/2001	4.05		3.78		0.27	2.33	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/19/2001	4.62		4.58		0.04	1.57	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/5/2001	5.01		5.01		<0.01	1.16	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/21/2001	4.51		4.51		<0.01	1.66	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/9/2001	4.45		4.45		<0.01	1.72	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/26/2001	3.61		3.61		<0.01	2.56	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/10/2001	2.98					3.18	6.16		9			-			Temporary	Damaged
WP9-3		6/13/2001	2.71					3.45	6.16		9			-			Temporary	Damaged
WP9-3		5/29/2001	3.27					2.89	6.16		9			-			Temporary	Damaged
WP9-3		5/17/2001	3.79		3.79		<0.01	2.38	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/3/2001	3.12					3.04	6.16		9			-			Temporary	Damaged
WP9-3		4/16/2001	3.15					3.01	6.16		9			-			Temporary	Damaged
WP9-3		4/6/2001	3.22					2.94	6.16		9			-			Temporary	Damaged
WP9-3		3/20/2001	2.58					3.58	6.16		9			-			Temporary	Damaged
WP9-3		3/6/2001	2.97					3.19	6.16		9			-			Temporary	Damaged
WP9-3		2/19/2001	3.9		3.9		<0.01	2.27	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		2/6/2001	3.41		3.41		<0.01	2.76	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/23/2001	3.77		3.77		<0.01	2.4	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/9/2001	4.05		4.05		<0.01	2.12	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/12/2000	3.3		3.3		<0.01	2.87	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		11/28/2000	3.32		3.32		<0.01	2.85	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		11/14/2000	3.2		3.2		<0.01	2.97	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		10/31/2000	3.3		3.24		0.06	2.91	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		10/18/2000	3.16		3.16		<0.01	3.01	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		10/2/2000	2.95		2.95		<0.01	3.22	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/19/2000	2.85		2.85		<0.01	3.32	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/6/2000	3.09		3.09		<0.01	3.08	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/23/2000	3.37					2.79	6.16		9			-			Temporary	Damaged
WP9-3		8/9/2000	2.76					3.4	6.16		9			-			Temporary	Damaged
WP9-3		7/25/2000	3.61		3.61		<0.01	2.56	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/11/2000	3.65		3.65		<0.01	2.52	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/27/2000	3.11		3.11		<0.01	3.06	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/16/2000	3.29		3.29		<0.01	2.88	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/1/2000	3.55		3.53		0.02	2.63	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/19/2000	3.35		3.35		<0.01	2.82	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/4/2000	3.38		3.38		<0.01	2.79	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/20/2000	2.74		2.74		<0.01	3.43	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/5/2000	2.75		2.75		<0.01	3.42	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/22/2000	2.8		2.8		<0.01	3.37	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/9/2000	2.74					3.42	6.16		9			-			Temporary	Damaged
WP9-3		2/24/2000	2.66		2.66		<0.01	3.51	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		2/11/2000	3.02		3.02		<0.01	3.15	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/26/2000	3.65		3.65		<0.01	2.52	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/14/2000	3.34		3.34		<0.01	2.83	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/30/1999	3.25		3.25		<0.01	2.92	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		12/16/1999	2.32		2.32		<0.01	3.85	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/6/1999	2.84		2.84		<0.01	3.33	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/1/1999	2.81		2.81		<0.01	3.36	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		11/18/1999	3.26		3.26		<0.01	2.91	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		11/4/1999	2.82					3.34	6.16		9			-			Temporary	Damaged
WP9-3		10/19/1999	2.74					3.42	6.16		9			-			Temporary	Damaged
WP9-3		10/7/1999	2.5					3.66	6.16		9			-			Temporary	Damaged
WP9-3		9/24/1999	1.26					4.9	6.16		9			-			Temporary	Damaged
WP9-3		9/9/1999	2.55		2.55		<0.01	3.62	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/27/1999	2.69		2.69		<0.01	3.48	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/12/1999	3.91					2.25	6.16		9			-			Temporary	Damaged
WP9-3		7/30/1999	4.1		3.69		0.41	2.39	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/16/1999	3.11		3.11		<0.01	3.06	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/30/1999	3.11		3.11		<0.01	3.06	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/15/1999	2.97		2.97		<0.01	3.2	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/2/1999	2.26		2.26		<0.01	3.91	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/19/1999	2.61					3.55	6.16		9			-			Temporary	Damaged
WP9-3		5/4/1999	2.45		2.45		<0.01	3.72	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/20/1999	2.63					3.53	6.16		9			-			Temporary	Damaged
WP9-3		4/12/1999	2.65		2.65		<0.01	3.52	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/29/1999	2.53					3.63	6.16		9			-			Temporary	Damaged
WP9-3		3/11/1999	3.26					2.9	6.16		9			-			Temporary	Damaged
WP9-3		3/2/1999	3.38					2.78	6.16		9			-			Temporary	Damaged
WP9-3		2/10/1999	2.69					3.47	6.16		9			-			Temporary	Damaged
WP9-3		1/29/1999	3.16					3	6.16		9			-			Temporary	Damaged
WP9-3		1/15/1999	3.2					2.96	6.16		9			-			Temporary	Damaged
WP9-3		12/29/1998	3.69					2.47	6.16		9			-			Temporary	Damaged
WP9-3		12/16/1998	4.08					2.08	6.16		9			-			Temporary	Damaged
WP9-3		12/1/1998	4.24					1.92	6.16		9			-			Temporary	Damaged
WP9-3		11/20/1998	4.08					2.08	6.16		9			-			Temporary	Damaged
WP9-3		11/4/1998	3.75					2.41	6.16		9			-			Temporary	Damaged
WP9-3		10/23/1998	3.99					2.17	6.16		9			-			Temporary	Damaged
WP9-3		10/9/1998	4.04					2.12	6.16		9			-			Temporary	Damaged
WP9-3		9/25/1998	3.17					2.99	6.16		9			-			Temporary	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		9/11/1998	3.05					3.11	6.16		9			-			Temporary	Damaged
WP9-3		8/28/1998	2.82					3.34	6.16		9			-			Temporary	Damaged
WP9-3		8/14/1998	2.95					3.21	6.16		9			-			Temporary	Damaged
WP9-3		7/31/1998	2.96		2.96		<0.01	3.21	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/16/1998	2.94		2.94		<0.01	3.23	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/2/1998	2.89		2.89		<0.01	3.28	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/19/1998	2.26					3.9	6.16		9			-			Temporary	Damaged
WP9-3		6/5/1998	2.24					3.92	6.16		9			-			Temporary	Damaged
WP9-3		5/20/1998	1.91					4.25	6.16		9			-			Temporary	Damaged
WP9-3		4/23/1998	1.79					4.37	6.16		9			-			Temporary	Damaged
WP9-3		4/10/1998	2.2		2.2		<0.01	3.97	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/27/1998	2.03		2.03		<0.01	4.14	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		3/12/1998	2.27					3.89	6.16		9			-			Temporary	Damaged
WP9-3		2/27/1998	2.53		2.53		<0.01	3.64	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		2/10/1998	2.61		2.61		<0.01	3.56	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/30/1998	2.32		2.32		<0.01	3.85	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		1/16/1998	2.82		2.82		<0.01	3.35	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/19/1997	3.13		3.13		<0.01	3.04	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		12/4/1997	2.7		2.7		<0.01	3.47	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		11/21/1997	3.44		3.44		<0.01	2.73	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		11/7/1997	3.59					2.57	6.16		9			-			Temporary	Damaged
WP9-3		10/24/1997	4.23		4.23		<0.01	1.94	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		10/10/1997	3.8		3.8		<0.01	2.37	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/24/1997	3.29		3.29		<0.01	2.88	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		9/12/1997	2.74		2.73		0.01	3.43	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/28/1997	3.4		3.23		0.17	2.9	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-3		8/14/1997	4.04		3.85		0.19	2.27	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		8/1/1997	3.53		3.36		0.17	2.77	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/17/1997	4.27		4.03		0.24	2.08	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		7/1/1997	3.48		3.37		0.11	2.77	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/20/1997	3.74		3.48		0.26	2.63	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		6/2/1997	2.79		2.52		0.27	3.59	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/22/1997	3.26		3.02		0.24	3.09	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		5/9/1997	2.53		2.4		0.13	3.74	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/22/1997	1.81		1.76		0.05	4.39	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-3		4/11/1997	2.18		2.07		0.11	4.07	6.16		9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE			Temporary	Damaged
WP9-4		5/17/2017	4.87	1.63				4.17	9.04	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		12/1/2016	4.01	0.77	3.53	0.29	0.48	5.41947	9.04	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		5/11/2016	5.07	1.83				3.97	9.04	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		11/19/2015	5.63	2.39				3.41	9.04	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/15/2015	5.82	2.75				3.05	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		12/4/2014	4.09	1.02				4.78	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/14/2014	2.44	-0.63				6.43	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		10/16/2013	5.68	2.61				3.19	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/28/2013	5.88	2.81				2.99	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/9/2012	5.83	2.76				3.04	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/18/2011	5.68	2.61				3.19	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		7/30/2010						NA	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/22/2009	3.54	0.47				5.33	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/23/2009	6.28	3.21				2.59	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		11/25/2008	4.92	1.85				3.95	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		8/18/2008	4.83	1.76				4.04	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/6/2008	5.13	2.06				3.74	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/31/2008	4.82	1.75				4.05	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		11/15/2007	5.22	2.15	5.15	2.08	0.07	3.71	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		9/18/2007	6.56	3.49	6.21	3.14	0.35	2.59	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		6/4/2007	5.09	2.02	4.97	1.9	0.12	3.88	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		3/2/2007	5.71	2.64				3.16	8.87	5.8	9			-	Stick Up		Temporary	Well Point

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		11/7/2006			5.07		<0.01	NA	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		8/29/2006						NA	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/24/2006	5.7	2.63	5.7	2.63	<0.01	3.18	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		2/8/2006						4.64	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		7/1/2005			6.19		0.03	3.89	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/19/2005	6.03	2.96	5.1	2.03	0.93	3.59	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		3/9/2005	5.37	2.3	5.3	2.23	0.07	3.56	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		10/8/2004	5.14	2.07	5	1.93	0.14	3.84	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		9/17/2004	6.27	3.2	6.13	3.06	0.14	2.71	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		9/2/2004	5.68	2.61	5.6	2.53	0.08	3.25	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		6/25/2004	5.85	2.78	5.78	2.71	0.07	3.08	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		6/10/2004	5.11	2.04	4.91	1.84	0.2	3.92	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		5/28/2004	5.21	2.14	5.12	2.05	0.09	3.73	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		5/12/2004	5.12	2.05	4.99	1.92	0.13	3.86	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		4/29/2004	5.16	2.09	5.05	1.98	0.11	3.8	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		4/15/2004						NA	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		4/2/2004	5.53	2.46	4.85	1.78	0.68	3.89	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		3/17/2004	5.66	2.59	5.09	2.02	0.57	3.67	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		3/3/2004	5.85	2.78				3.02	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		2/17/2004	5.53	2.46				3.34	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		2/3/2004	6.62	3.55	6.62	3.55	<0.01	2.26	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		1/6/2004	5.53	2.46	5.53	2.46	<0.01	3.35	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		12/22/2003	4.3	1.23				4.57	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		11/25/2003	5.25	2.18	5.25	2.18	<0.01	3.63	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		11/18/2003	5.25	2.18	5.25	2.18	<0.01	3.63	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		11/5/2003	4.6	1.53	4.6	1.53	<0.01	4.28	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/22/2003	4.63	1.56	4.63	1.56	<0.01	4.25	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/7/2003	5.3	2.23	5.3	2.23	<0.01	3.58	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		9/24/2003	4.51	1.44				4.36	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/8/2003	5.02	1.95	5.02	1.95	<0.01	3.86	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		8/27/2003	5.21	2.14				3.66	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		8/12/2003	4.67	1.6	4.66	1.59	0.01	4.21	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		7/18/2003	5.03	1.96				3.84	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		7/7/2003	4.79	1.72				4.08	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		6/30/2003	4.69	1.62				4.18	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		6/17/2003	4.25	1.18				4.62	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		6/2/2003	4.29	1.22	4.28	1.21	0.01	4.59	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		5/20/2003	4.85	1.78	4.85	1.78	<0.01	4.03	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		5/8/2003	4.92	1.85				3.95	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		4/25/2003	4.89	1.82	4.89	1.82	<0.01	3.99	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		4/9/2003	4.65	1.58	4.65	1.58	<0.01	4.23	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		3/26/2003	4.94	1.87	4.91	1.84	0.03	3.95	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		3/12/2003	4.71	1.64	4.71	1.64	<0.01	4.17	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		2/27/2003	3.64	0.57	3.64	0.57	<0.01	5.24	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		2/13/2003	5.9	2.83	5.89	2.82	0.01	2.98	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		1/28/2003	6.1	3.03	6.05	2.98	0.05	2.81	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		1/24/2003	6.05	2.98	5.98	2.91	0.07	2.88	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		12/30/2002	4.85	1.78	4.6	1.53	0.25	4.22	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		12/19/2002	6.25	3.18	5.97	2.9	0.28	2.85	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		12/4/2002	5.97	2.9	5.11	2.04	0.86	3.6	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		11/18/2002	4.9	1.83	4.13	1.06	0.77	4.59	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/31/2002	4.69	1.62	3.98	0.91	0.71	4.76	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/18/2002	5.02	1.95	4.14	1.07	0.88	4.56	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/4/2002	5.02	1.95	4.88	1.81	0.14	3.96	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		9/17/2002	5.53	2.46	5.33	2.26	0.2	3.5	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		9/4/2002	5.06	1.99	4.92	1.85	0.14	3.92	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		8/12/2002	6.18	3.11	5.6	2.53	0.58	3.16	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		7/22/2002	5.85	2.78	5.32	2.25	0.53	3.45	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		6/27/2002	6	2.93	4.85	1.78	1.15	3.8	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		6/14/2002	5.86	2.79	4.96	1.89	0.9	3.74	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		5/31/2002	6.45	3.38	4.99	1.92	1.46	3.6	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		5/15/2002	4.91	1.84	4.91	1.84	<0.01	3.97	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		5/1/2002	4.87	1.8				4	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		4/19/2002	4.99	1.92				3.88	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		4/2/2002	4.93	1.86				3.94	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		3/19/2002	5.37	2.3				3.5	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		3/5/2002	5.94	2.87				2.93	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		2/19/2002	5.94	2.87				2.93	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		2/7/2002	5.92	2.85				2.95	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		1/21/2002	5.83	2.76				3.04	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		1/9/2002	5.76	2.69				3.11	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		12/28/2001	5.65	2.58				3.22	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		12/11/2001	6.02	2.95				2.85	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		11/8/2001	6.67	3.6				2.2	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		10/31/2001	6.3	3.23				2.57	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		10/17/2001	5.92	2.85				2.95	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		10/2/2001	6.29	3.22				2.58	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/19/2001	7.01	3.94				1.86	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/5/2001	7.32	4.25	7.27	4.2	0.05	1.59	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		8/21/2001	6.93	3.86				1.94	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		8/9/2001	6.86	3.79				2.01	8.87	5.8	9			-	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		7/26/2001	6.08	3.01				2.79	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		7/10/2001	5.51	2.44				3.36	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/13/2001	5.23	2.16				3.64	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/29/2001	5.5	2.43				3.37	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/17/2001	6.02	2.95	6.02	2.95	<0.01	2.86	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		5/3/2001	5.56	2.49				3.31	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		4/16/2001	5.36	2.29				3.51	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		4/6/2001	5.46	2.39				3.41	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/20/2001	4.83	1.76				4.04	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/6/2001	5.26	2.19				3.61	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		2/19/2001	6.35	3.28				2.52	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		2/6/2001	5.54	2.47	5.54	2.47	<0.01	3.34	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		1/23/2001	6.26	3.19				2.61	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		1/9/2001	6.47	3.4	6.47	3.4	<0.01	2.41	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		12/12/2000	5.76	2.69	5.76	2.69	<0.01	3.12	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		11/28/2000	5.76	2.69	5.75	2.68	0.01	3.12	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		11/14/2000	5.86	2.79	5.75	2.68	0.11	3.1	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		10/31/2000	6.02	2.95	5.63	2.56	0.39	3.17	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		10/18/2000	6.07	3	5.44	2.37	0.63	3.31	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		10/2/2000	5.77	2.7	5.27	2.2	0.5	3.51	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		9/19/2000	5.26	2.19	5.26	2.19	<0.01	3.62	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		9/6/2000	5.56	2.49	5.56	2.49	<0.01	3.32	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		8/23/2000	5.82	2.75				3.05	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		8/9/2000	5.24	2.17				3.63	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		7/25/2000	6.08	3.01				2.79	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		7/11/2000	6.05	2.98				2.82	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/27/2000	5.51	2.44				3.36	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/16/2000	5.72	2.65				3.15	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/1/2000	5.58	2.51				3.29	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/19/2000	5.78	2.71				3.09	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/4/2000	5.79	2.72				3.08	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		4/20/2000	5.03	1.96				3.84	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		4/5/2000	5.1	2.03				3.77	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/22/2000	4.94	1.87				3.93	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		3/9/2000	5.29	2.22				3.58	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		2/24/2000	5.17	2.1				3.7	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		2/11/2000	5.57	2.5				3.3	8.87	5.8	9			-	Stick Up		Temporary	Well Point

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		1/26/2000	6.15	3.08	6.15	3.08	<0.01	2.73	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		1/14/2000	5.94	2.87	5.94	2.87	<0.01	2.94	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		12/30/1999	5.87	2.8	5.87	2.8	<0.01	3.01	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		12/16/1999	4.82	1.75	4.81	1.74	0.01	4.06	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		12/6/1999	5.35	2.28	5.35	2.28	<0.01	3.53	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		12/1/1999	5.51	2.44	5.45	2.38	0.06	3.41	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		11/18/1999	5.99	2.92	5.65	2.58	0.34	3.16	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		11/4/1999	5.47	2.4	5.09	2.02	0.38	3.71	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/19/1999	5.41	2.34	5.01	1.94	0.4	3.78	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		10/7/1999	4.81	1.74				4.06	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/24/1999	3.59	0.52				5.28	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/9/1999	4.76	1.69				4.11	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		8/27/1999	4.99	1.92				3.88	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		8/12/1999	6.28	3.21				2.59	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		7/30/1999	6.22	3.15	6.1	3.03	0.12	2.75	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		7/16/1999	5.46	2.39				3.41	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		6/30/1999	5.72	2.65				3.15	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		6/15/1999	5.51	2.44				3.36	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		6/2/1999	4.75	1.68	4.75	1.68	<0.01	4.13	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary Well Point	
WP9-4		5/19/1999	5.24	2.17				3.63	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		5/4/1999	5.01	1.94				3.86	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		4/20/1999	5.06	1.99				3.81	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		4/12/1999	5.01	1.94				3.86	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		3/29/1999	4.88	1.81				3.99	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		3/11/1999	5.78	2.71				3.09	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		3/2/1999	5.98	2.91				2.89	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		2/10/1999	5.16	2.09				3.71	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		1/29/1999	5.72	2.65				3.15	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		1/15/1999	5.43	2.36				3.44	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		12/29/1998	6.37	3.3				2.5	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		12/16/1998	6.67	3.6				2.2	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		12/1/1998	6.85	3.78				2.02	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		11/20/1998	6.79	3.72				2.08	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		11/4/1998	6.36	3.29				2.51	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		10/23/1998	6.6	3.53				2.27	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		10/9/1998	6.63	3.56				2.24	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/25/1998	5.89	2.82				2.98	8.87	5.8	9			-	Stick Up		Temporary Well Point	
WP9-4		9/11/1998	5.73	2.66				3.14	8.87	5.8	9			-	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		8/28/1998	5.47	2.4				3.4	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		8/14/1998	5.61	2.54				3.26	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		7/31/1998	5.54	2.47	5.54	2.47	<0.01	3.34	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		7/16/1998	5.68	2.61	5.68	2.61	<0.01	3.2	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		7/2/1998	5.51	2.44				3.36	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		6/19/1998	4.85	1.78	4.85	1.78	<0.01	4.03	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		6/5/1998	4.92	1.85				3.95	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		5/20/1998	4.57	1.5	4.54	1.47	0.03	4.32	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		4/23/1998	4.41	1.34	4.41	1.34	<0.01	4.47	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		4/10/1998	4.62	1.55	4.62	1.55	<0.01	4.26	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		3/27/1998	4.64	1.57	4.64	1.57	<0.01	4.24	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		3/12/1998	4.86	1.79	4.86	1.79	<0.01	4.02	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		2/27/1998	5.12	2.05	5.12	2.05	<0.01	3.76	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		2/10/1998	5.26	2.19				3.61	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		1/30/1998	4.88	1.81				3.99	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		1/16/1998	5.36	2.29				3.51	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		12/19/1997	5.76	2.69				3.11	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		12/4/1997	5.33	2.26				3.54	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		11/21/1997	6.13	3.06				2.74	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		11/7/1997	6.22	3.15				2.65	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		10/24/1997	6.91	3.84	6.91	3.84	<0.01	1.97	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		10/10/1997	6.48	3.41				2.39	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		9/24/1997	5.91	2.84				2.96	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		9/12/1997	5.42	2.35				3.45	8.87	5.8	9			-	Stick Up		Temporary	Well Point
WP9-4		8/28/1997	5.9	2.83	5.84	2.77	0.06	3.02	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		8/14/1997	6.63	3.56	6.42	3.35	0.21	2.41	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		8/1/1997	6.12	3.05	5.94	2.87	0.18	2.9	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		7/17/1997	6.98	3.91	6.6	3.53	0.38	2.2	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		7/1/1997	6.19	3.12	5.97	2.9	0.22	2.86	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-4		6/20/1997	6.37	3.3	6.06	2.99	0.31	2.75	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		6/2/1997	5.33	2.26	5.18	2.11	0.15	3.66	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		5/22/1997	5.94	2.87	5.58	2.51	0.36	3.22	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		5/9/1997	5.26	2.19	4.99	1.92	0.27	3.83	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		4/22/1997	4.54	1.47	4.34	1.27	0.2	4.49	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-4		4/11/1997	4.89	1.82	4.64	1.57	0.25	4.18	8.87	5.8	9	WP9-2	0.8114	80% AVIATION GASOLINE, 20% MIDDLE DISTILLATE	Stick Up		Temporary	Well Point
WP9-5		11/25/2008						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		8/18/2008						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/6/2008						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/31/2008						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/15/2007						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		9/18/2007						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/4/2007						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/2/2007						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/7/2006						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		8/29/2006						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		5/24/2006						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		2/8/2006						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		5/19/2005						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/17/2005						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/9/2005						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		10/8/2004						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		9/17/2004						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/25/2004						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/3/2004						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/25/2003						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/18/2003						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		8/27/2003						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		7/7/2003						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/12/2003						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		10/31/2002						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		8/12/2002						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/14/2002						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/8/2001						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		10/17/2001	6.58					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		9/19/2001						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/13/2001	0.93					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		2/19/2001	2					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/14/2000						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		9/6/2000	1.36					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/16/2000	1.32					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/9/2000	1.27					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		12/6/1999						NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		11/18/1999	1.89					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		9/24/1999	0.58					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/15/1999	0.18					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/11/1999	1.55					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		12/16/1998	2.45					NA		-1.05	10.5			-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WP9-5		9/11/1998	1.65					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/19/1998	4.46					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		3/27/1998	4.36					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		12/19/1997	5.32					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		9/24/1997	5.37					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		7/17/1997	6.16					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		7/1/1997	5.62					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/20/1997	5.58					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		6/2/1997	4.51					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		5/22/1997	5.25					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		5/9/1997	4.4					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		4/22/1997	4.14					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-5		4/11/1997	4.49					NA		-1.05	10.5			-			Temporary	Destroyed
WP9-6		12/31/2011						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		7/30/2010						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		11/25/2008						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		3/12/2003						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		10/31/2002						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		8/12/2002						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		6/14/2002						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		2/19/2002						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		11/8/2001	3.84					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		9/6/2000						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		6/16/2000						NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		3/9/2000	4.93					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		12/6/1999	4.76					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		11/18/1999	5.27					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		9/24/1999	4.59					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		6/15/1999	4.55					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		3/11/1999	4.88					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		12/16/1998	6.27					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		9/11/1998	5.07					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		6/19/1998	4.62					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		3/27/1998	4.61					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		12/19/1997	5.06					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		9/24/1997	5.16					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		7/17/1997	5.84					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		7/1/1997	5.48					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		6/20/1997	5.01					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		6/2/1997	4.33					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		5/22/1997	5.19					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		5/9/1997	4.38					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		4/22/1997	4.63					NA		10.02	10.5			-			Temporary	Destroyed
WP9-6		4/11/1997	4.83					NA		10.02	10.5			-			Temporary	Destroyed
WPM-1		11/25/2008						NA		13.8				-			Temporary	Destroyed
WPM-1		6/6/2008						NA		13.8				-			Temporary	Destroyed
WPM-1		11/15/2007						NA		13.8				-			Temporary	Destroyed
WPM-1		6/4/2007						NA		13.8				-			Temporary	Destroyed
WPM-1		11/7/2006						NA		13.8				-			Temporary	Destroyed
WPM-1		5/24/2006						NA		13.8				-			Temporary	Destroyed
WPM-1		5/19/2005						NA		13.8				-			Temporary	Destroyed
WPM-1		10/8/2004						NA		13.8				-			Temporary	Destroyed
WPM-1		9/17/2004						NA		13.8				-			Temporary	Destroyed
WPM-1		6/28/2004						NA		13.8				-			Temporary	Destroyed
WPM-1		3/3/2004						NA		13.8				-			Temporary	Destroyed
WPM-1		11/25/2003						NA		13.8				-			Temporary	Destroyed
WPM-1		11/18/2003						NA		13.8				-			Temporary	Destroyed
WPM-1		8/27/2003	7.22					NA		13.8				-			Temporary	Destroyed
WPM-1		7/7/2003	7.11					NA		13.8				-			Temporary	Destroyed
WPM-1		3/12/2003	7.3					NA		13.8				-			Temporary	Destroyed

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-1		10/31/2002	6.52					NA		13.8				-			Temporary	Destroyed
WPM-1		8/12/2002	7.59					NA		13.8				-			Temporary	Destroyed
WPM-1		6/14/2002	7.13					NA		13.8				-			Temporary	Destroyed
WPM-1		2/19/2002	8.12					NA		13.8				-			Temporary	Destroyed
WPM-1		11/8/2001	9.01					NA		13.8				-			Temporary	Destroyed
WPM-1		9/5/2001	7.73					NA		13.8				-			Temporary	Destroyed
WPM-1		6/13/2001	7.15					NA		13.8				-			Temporary	Destroyed
WPM-1		2/19/2001	7.43					NA		13.8				-			Temporary	Destroyed
WPM-1		11/14/2000	7.57					NA		13.8				-			Temporary	Destroyed
WPM-1		9/6/2000	7.04					NA		13.8				-			Temporary	Destroyed
WPM-1		6/16/2000	7.27					NA		13.8				-			Temporary	Destroyed
WPM-1		3/9/2000	7.69					NA		13.8				-			Temporary	Destroyed
WPM-1		11/18/1999	8.05					NA		13.8				-			Temporary	Destroyed
WPM-1		9/24/1999	6.95					NA		13.8				-			Temporary	Destroyed
WPM-1		6/15/1999	7.09					NA		13.8				-			Temporary	Destroyed
WPM-1		3/11/1999	6.97					NA		13.8				-			Temporary	Destroyed
WPM-1		12/17/1998	8.67					NA		13.8				-			Temporary	Destroyed
WPM-1		9/10/1998	7.31					NA		13.8				-			Temporary	Destroyed
WPM-1		6/19/1998	6.74					NA		13.8				-			Temporary	Destroyed
WPM-1		3/27/1998	6.93					NA		13.8				-			Temporary	Destroyed
WPM-1		12/19/1997	7.93					NA		13.8				-			Temporary	Destroyed
WPM-1		9/26/1997	7.57					NA		13.8				-			Temporary	Destroyed
WPM-1		7/17/1997	6.84					NA		13.8				-			Temporary	Destroyed
WPM-1		7/1/1997	6.94					NA		13.8				-			Temporary	Destroyed
WPM-1		6/20/1997	7.04					NA		13.8				-			Temporary	Destroyed
WPM-1		6/3/1997	6.72					NA		13.8				-			Temporary	Destroyed
WPM-1		5/22/1997	7.18					NA		13.8				-			Temporary	Destroyed
WPM-1		5/9/1997	6.91					NA		13.8				-			Temporary	Destroyed
WPM-1		4/24/1997	6.96					NA		13.8				-			Temporary	Destroyed
WPM-1		4/11/1997	7.27					NA		13.8				-			Temporary	Destroyed
WPM-10		11/25/2008						NA		9.99				-			Temporary	Destroyed
WPM-10		6/6/2008						NA		9.99				-			Temporary	Destroyed
WPM-10		11/15/2007						NA		9.99				-			Temporary	Destroyed
WPM-10		6/4/2007						NA		9.99				-			Temporary	Destroyed
WPM-10		11/7/2006						NA		9.99				-			Temporary	Destroyed
WPM-10		5/24/2006						NA		9.99				-			Temporary	Destroyed
WPM-10		5/19/2005						NA		9.99				-			Temporary	Destroyed
WPM-10		10/8/2004						NA		9.99				-			Temporary	Destroyed
WPM-10		6/28/2004						NA		9.99				-			Temporary	Destroyed
WPM-10		3/3/2004						NA		9.99				-			Temporary	Destroyed
WPM-10		11/25/2003	2.92					NA		9.99				-			Temporary	Destroyed
WPM-10		11/18/2003	2.89					NA		9.99				-			Temporary	Destroyed
WPM-10		8/27/2003	3.5					NA		9.99				-			Temporary	Destroyed
WPM-10		7/7/2003						NA		9.99				-			Temporary	Destroyed
WPM-10		3/12/2003	2.18					NA		9.99				-			Temporary	Destroyed
WPM-10		10/31/2002	1.58					NA		9.99				-			Temporary	Destroyed
WPM-10		8/12/2002	4.03					NA		9.99				-			Temporary	Destroyed
WPM-10		6/14/2002	2.4					NA		9.99				-			Temporary	Destroyed
WPM-10		2/19/2002	4.06					NA		9.99				-			Temporary	Destroyed
WPM-10		11/8/2001	4.77					NA		9.99				-			Temporary	Destroyed
WPM-10		9/5/2001	4.35					NA		9.99				-			Temporary	Destroyed
WPM-10		6/13/2001	3.01					NA		9.99				-			Temporary	Destroyed
WPM-10		2/19/2001	2.51					NA		9.99				-			Temporary	Destroyed
WPM-10		11/14/2000	3.61					NA		9.99				-			Temporary	Destroyed
WPM-10		9/6/2000	2.67					NA		9.99				-			Temporary	Destroyed
WPM-10		6/16/2000	2.81					NA		9.99				-			Temporary	Destroyed
WPM-10		3/9/2000	3.55					NA		9.99				-			Temporary	Destroyed
WPM-10		11/18/1999	3.7					NA		9.99				-			Temporary	Destroyed
WPM-10		9/24/1999	2.26					NA		9.99				-			Temporary	Destroyed
WPM-10		6/15/1999	3.41					NA		9.99				-			Temporary	Destroyed

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-10		3/11/1999	2.92					NA		9.99				-			Temporary	Destroyed
WPM-10		12/17/1998	4.58					NA		9.99				-			Temporary	Destroyed
WPM-10		9/10/1998	3.78					NA		9.99				-			Temporary	Destroyed
WPM-10		6/19/1998	2.65					NA		9.99				-			Temporary	Destroyed
WPM-10		3/27/1998	2.51					NA		9.99				-			Temporary	Destroyed
WPM-10		12/19/1997	3.85					NA		9.99				-			Temporary	Destroyed
WPM-10		9/26/1997	3.81					NA		9.99				-			Temporary	Destroyed
WPM-10		7/17/1997	3.03					NA		9.99				-			Temporary	Destroyed
WPM-10		7/1/1997	2.72					NA		9.99				-			Temporary	Destroyed
WPM-10		6/20/1997	2.55					NA		9.99				-			Temporary	Destroyed
WPM-10		6/3/1997	1.74					NA		9.99				-			Temporary	Destroyed
WPM-10		5/22/1997	2.35					NA		9.99				-			Temporary	Destroyed
WPM-10		5/9/1997	1.91					NA		9.99				-			Temporary	Destroyed
WPM-10		4/24/1997	1.96					NA		9.99				-			Temporary	Destroyed
WPM-10		4/11/1997	2.14					NA		9.99				-			Temporary	Destroyed
WPM-11		5/11/2017	1.04	1.39				5.469	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/11/2016	0.88	1.23				5.63	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/15/2015	0.86	1.21				5.65	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/4/2014	1.09	1.44				5.42	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/14/2014	0.88	1.23				5.63	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/16/2013	1.11	1.46	1.1	1.45	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/28/2013	0.87	1.22				5.64	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/9/2012	0.85	1.2				5.66	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/2/2011	1.1	1.45				5.41	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/30/2010						NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/22/2009	0.99	1.34				5.52	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/23/2009	1.19	1.54				5.32	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/25/2008	1.76	2.11	1.76	2.11	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/6/2008	1.13	1.48				5.38	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/15/2007	1.71	2.06				4.8	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/4/2007	1.13	1.48				5.38	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/7/2006			1.87		<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/24/2006	1.29	1.64				5.22	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/19/2005	1.7	2.05				4.81	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/8/2004	1.8	2.15	1.8	2.15	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/17/2004	1.16	1.51	1.16	1.51	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/28/2004	1.15	1.5				5.36	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/10/2004	1.12	1.47				5.39	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/28/2004	1.18	1.53				5.33	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/12/2004	1.14	1.49				5.37	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/29/2004	1.29	1.64				5.22	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/15/2004	1.19	1.54				5.32	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/2/2004	1.15	1.5				5.36	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/17/2004	1.17	1.52				5.34	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/3/2004	1.64	1.99				4.87	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/17/2004	1	1.35				5.51	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/3/2004	3.26	3.61				3.25	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/6/2004	1.3	1.65				5.21	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/22/2003	1.4	1.75				5.11	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/25/2003	1.68	2.03				4.83	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/18/2003	1.68	2.03				4.83	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/5/2003	1.5	1.85				5.01	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/22/2003	1.15	1.5				5.36	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/7/2003	1.87	2.22				4.64	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/24/2003	1.25	1.6				5.26	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/8/2003	1.19	1.54				5.32	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/27/2003	1.13	1.48				5.38	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/12/2003	1.16	1.51				5.35	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/18/2003	1.18	1.53				5.33	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/7/2003	1.05	1.4				5.46	6.509	6.858				-	Flush		Temporary	Well Point

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-11		6/30/2003	1.24	1.59				5.27	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		6/17/2003	1.1	1.45				5.41	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		6/2/2003	1.3	1.65				5.21	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		5/8/2003	1.4	1.75				5.11	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		4/25/2003	1.45	1.8				5.06	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		4/9/2003	0.91	1.26				5.6	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		3/26/2003	1.14	1.49				5.37	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		3/12/2003	1.19	1.54				5.32	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		2/27/2003	1.53	1.88				4.98	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		2/13/2003	2.16	2.51				4.35	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		1/28/2003	3.26	3.61				3.25	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		1/24/2003	3.21	3.56				3.3	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		12/19/2002	1.87	2.22				4.64	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		12/4/2002	2.11	2.46				4.4	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		11/18/2002	1.74	2.09				4.77	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/31/2002	1.82	2.17	1.82	2.17	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/18/2002	1.94	2.29				4.57	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/4/2002	1.75	2.1				4.76	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		9/17/2002	1.69	2.04				4.82	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		9/4/2002	1.58	1.93				4.93	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		8/21/2002	1.85	2.2				4.66	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		8/12/2002	1.49	1.84				5.02	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		6/27/2002	1.22	1.57				5.29	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		6/14/2002	1.2	1.55				5.31	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		5/31/2002	1.25	1.6				5.26	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		3/19/2002	1.75	2.1				4.76	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		3/5/2002	1.83	2.18				4.68	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		2/19/2002	2.05	2.4				4.46	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		2/7/2002	1.82	2.17				4.69	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		1/21/2002	1.87	2.22				4.64	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		1/9/2002	1.87	2.22				4.64	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		12/28/2001	2.22	2.57				4.29	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		12/11/2001	2.82	3.17				3.69	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		11/27/2001	3.45	3.8				3.06	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/31/2001	3.2	3.55				3.31	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/17/2001	2.4	2.75				4.11	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/2/2001	2	2.35	2	2.35	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		9/19/2001	1.96	2.31	1.96	2.31	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		9/5/2001	1.86	2.21	1.86	2.21	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		8/21/2001	1.31	1.66	1.31	1.66	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		8/9/2001	1.26	1.61	1.26	1.61	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		7/26/2001	1.02	1.37	1.02	1.37	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		7/10/2001	0.76	1.11	0.76	1.11	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		6/28/2001	0.95	1.3	0.95	1.3	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		6/13/2001	1.34	1.69	1.34	1.69	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		5/29/2001	1.21	1.56	1.21	1.56	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		5/17/2001	1.76	2.11	1.76	2.11	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		5/3/2001	1.37	1.72				5.14	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		4/16/2001	1.08	1.43				5.43	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		4/6/2001	1.15	1.5				5.36	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		3/20/2001	1.28	1.63				5.23	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		3/6/2001	1.03	1.38				5.48	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		2/19/2001	1.27	1.62				5.24	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		2/6/2001	0.68	1.03				5.83	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		1/23/2001	1.19	1.54				5.32	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		1/10/2001	1.72	2.07				4.79	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		12/12/2000	1.97	2.32	1.97	2.32	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		11/28/2000	1.85	2.2	1.85	2.2	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		11/14/2000	1.85	2.2	1.85	2.2	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	
WPM-11		10/31/2000	2.35	2.7	2.35	2.7	<0.01	NA	6.509	6.858				-	Flush		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-11		10/2/2000	1.37	1.72	1.37	1.72	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/19/2000	1.09	1.44	1.09	1.44	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/6/2000	1.19	1.54	1.19	1.54	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/22/2000	1.17	1.52	1.17	1.52	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/9/2000	0.86	1.21	0.86	1.21	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/25/2000	0.98	1.33	0.98	1.33	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/11/2000	0.92	1.27	0.92	1.27	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/27/2000	1.06	1.41	1.06	1.41	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/16/2000	1.34	1.69	1.34	1.69	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/31/2000	1.45	1.8	1.45	1.8	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/19/2000	0.93	1.28	0.93	1.28	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/2/2000	1.52	1.87	1.52	1.87	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/20/2000	6.26	6.61	6.26	6.61	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/4/2000	6.01	6.36	6.01	6.36	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/22/2000	6	6.35	6	6.35	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/9/2000	6.37	6.72	6.37	6.72	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/24/2000	6.19	6.54	6.19	6.54	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/11/2000	5.94	6.29	5.94	6.29	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/26/2000	7.68	8.03	7.68	8.03	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/13/2000	6.33	6.68	6.33	6.68	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/29/1999	6.42	6.77	6.42	6.77	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/14/1999	6.38	6.73	6.38	6.73	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/1/1999	7.02	7.37	7.02	7.37	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/18/1999	7.51	7.86				-1	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/3/1999	6.4	6.75	6.4	6.75	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/20/1999	6.11	6.46	6.11	6.46	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/7/1999	6.65	7	6.65	7	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/24/1999	6.28	6.63	6.28	6.63	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/9/1999	6.13	6.48	6.13	6.48	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/27/1999	6.05	6.4	6.05	6.4	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/12/1999	6.46	6.81	6.45	6.8	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/30/1999	5.99	6.34	5.98	6.33	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/13/1999	6.21	6.56	6.21	6.56	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/30/1999	6.21	6.56	6.1	6.45	0.11	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/15/1999	6.38	6.73	6.38	6.73	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/2/1999	6.19	6.54	6.19	6.54	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/20/1999	6.55	6.9	6.5	6.85	0.05	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/4/1999	6.49	6.84	6.49	6.84	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/20/1999	6.3	6.65	6.24	6.59	0.06	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/12/1999	6.08	6.43	6.08	6.43	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/25/1999	6.25	6.6	6.25	6.6	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/11/1999	7.1	7.45	6.35	6.7	0.75	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/2/1999	6.39	6.74	6.39	6.74	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/9/1999	6.28	6.63	6.28	6.63	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/29/1999	6.63	6.98	6.63	6.98	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/15/1999	6.87	7.22	6.87	7.22	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/30/1998	7.33	7.68	7.32	7.67	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/17/1998	7.69	8.04	7.69	8.04	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/4/1998	7.84	8.19	7.84	8.19	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/20/1998	7.97	8.32	7.97	8.32	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/4/1998	7.73	8.08	7.73	8.08	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/23/1998	7.48	7.83	7.48	7.83	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/9/1998	6.89	7.24	6.88	7.23	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/25/1998	7.1	7.45	6.9	7.25	0.2	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/10/1998	6.49	6.84	6.49	6.84	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/28/1998	6.12	6.47	6.11	6.46	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/13/1998	6.17	6.52	6.16	6.51	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/31/1998	5.68	6.03	5.68	6.03	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/16/1998	5.82	6.17	5.81	6.16	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/2/1998	6.11	6.46	6.11	6.46	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-11		6/19/1998	5.96	6.31	5.95	6.3	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/5/1998	6.06	6.41	6.05	6.4	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/21/1998	5.98	6.33	5.97	6.32	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/23/1998	6.43	6.78	6.1	6.45	0.33	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/10/1998	6.09	6.44	6.08	6.43	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/27/1998	6.2	6.55	6.19	6.54	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		3/12/1998	6.39	6.74	6.38	6.73	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/27/1998	6.28	6.63	6.28	6.63	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		2/10/1998	6.54	6.89	6.53	6.88	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/30/1998	6.23	6.58	6.22	6.57	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		1/16/1998	6.22	6.57	6.22	6.57	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/19/1997	7.03	7.38	7.02	7.37	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		12/4/1997	6.63	6.98	6.62	6.97	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/21/1997	7.02	7.37	7.01	7.36	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		11/7/1997	6.9	7.25	6.89	7.24	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/24/1997	7.5	7.85	7.5	7.85	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		10/10/1997	7.03	7.38	7.02	7.37	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/26/1997	6.79	7.14	6.79	7.14	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		9/12/1997	6.42	6.77	6.42	6.77	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/28/1997	5.88	6.23	5.87	6.22	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/15/1997	5.98	6.33	5.96	6.31	0.02	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		8/1/1997	5.8	6.15	5.79	6.14	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/17/1997	5.64	5.99	5.64	5.99	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		7/1/1997	5.89	6.24	5.88	6.23	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/20/1997	6.09	6.44	6.08	6.43	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		6/3/1997	5.84	6.19	5.83	6.18	0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/22/1997	6.02	6.37	6.02	6.37	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		5/9/1997	6.05	6.4	6.05	6.4	<0.01	NA	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/24/1997	5.57	5.92				0.94	6.509	6.858				-	Flush		Temporary	Well Point
WPM-11		4/11/1997	6.18	6.53				0.33	6.509	6.858				-	Flush		Temporary	Well Point
WPM-2		5/11/2017						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/11/2016						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/15/2015						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/4/2014	3.74	4.23				3.73	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/14/2014						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/16/2013	3.54	4.03				3.93	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/28/2013						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/9/2012						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/18/2011	5.55	6.04				1.92	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/30/2010						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/22/2009	8.17	8.66				-0.7	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/25/2008	8.22	8.71				-0.75	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/6/2008	7.16	7.65				0.31	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/15/2007	8.3	8.79				-0.83	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/4/2007	7.89	8.38				-0.42	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/7/2006						NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/24/2006	7.84	8.33				-0.37	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/19/2005	7.75	8.24				-0.28	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/8/2004	7.68	8.17				-0.21	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/17/2004	7.94	8.43				-0.47	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/28/2004	7.69	8.18				-0.22	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/3/2004	8.57	9.06				-1.1	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/25/2003	7.88	8.37				-0.41	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/18/2003	7.85	8.34				-0.38	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/27/2003	7.98	8.47				-0.51	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/7/2003	7.57	8.06				-0.1	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/12/2003	7.36	7.85				0.11	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/31/2002	7.35	7.84				0.12	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/12/2002	8.71	9.2				-1.24	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/14/2002	6.27	6.76				1.2	7.47	7.964				-	Flush		Temporary	unable to a

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-2		2/19/2002	8.84	9.33				-1.37	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/8/2001	9.15	9.64				-1.68	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/5/2001	8.87	9.36	8.87	9.36	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/13/2001	7.55	8.04				-0.08	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		2/19/2001	7.91	8.4				-0.44	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/14/2000	8.19	8.68				-0.72	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/6/2000	7.64	8.13	7.64	8.13	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/16/2000	7.56	8.05				-0.09	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/9/2000	7.99	8.48				-0.52	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/18/1999	8.43	8.92				-0.96	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/24/1999	7.45	7.94				0.02	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/9/1999	7.93	8.42				-0.46	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/27/1999	8.31	8.8				-0.84	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/12/1999	8.79	9.28				-1.32	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/30/1999	8.31	8.8	8.31	8.8	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/13/1999	8.17	8.66				-0.7	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/30/1999	8.04	8.53				-0.57	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/15/1999	7.76	8.25				-0.29	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/2/1999	7.47	7.96				0	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/20/1999	7.74	8.23				-0.27	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/4/1999	7.52	8.01				-0.05	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/20/1999	7.35	7.84				0.12	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/12/1999	6.71	7.2				0.76	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/25/1999	7.1	7.59				0.37	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/11/1999	7.64	8.13				-0.17	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/2/1999	7.91	8.4				-0.44	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		2/9/1999	7.71	8.2				-0.24	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		1/29/1999	8.22	8.71				-0.75	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		1/15/1999	8.73	9.22				-1.26	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/30/1998	9.18	9.67				-1.71	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/17/1998	9.02	9.51				-1.55	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/4/1998	9.03	9.52				-1.56	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/20/1998	8.89	9.38				-1.42	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/4/1998	9.21	9.7				-1.74	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/23/1998	9.08	9.57				-1.61	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/9/1998	9.17	9.66				-1.7	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/25/1998	8.96	9.45				-1.49	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/10/1998	8.95	9.44				-1.48	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/28/1998	8.67	9.16				-1.2	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/13/1998	8.75	9.24				-1.28	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/31/1998	8.65	9.14				-1.18	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/21/1998	8.36	8.85	8.36	8.85	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/16/1998	8.27	8.76				-0.8	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/9/1998	8.18	8.67				-0.71	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/2/1998	8.27	8.76				-0.8	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/24/1998	8.09	8.58				-0.62	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/19/1998	8.03	8.52				-0.56	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/11/1998	8.31	8.8	8.31	8.8	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/5/1998	8.12	8.61	8.12	8.61	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/29/1998	8.06	8.55	8.06	8.55	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/21/1998	7.75	8.24				-0.28	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/20/1998	7.75	8.24	7.75	8.24	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/14/1998	7.78	8.27				-0.31	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/28/1998	8.27	8.76	8.27	8.76	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/23/1998	7.84	8.33				-0.37	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/15/1998	7.98	8.47	7.98	8.47	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/10/1998	8.11	8.6				-0.64	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/2/1998	7.99	8.48	7.99	8.48	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/27/1998	7.89	8.38				-0.42	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/19/1998	7.91	8.4	7.91	8.4	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-2		3/12/1998	8.06	8.55				-0.59	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		3/6/1998	8.01	8.5	8.01	8.5	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		2/27/1998	7.84	8.33				-0.37	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		2/18/1998	8.01	8.5	8.01	8.5	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		2/10/1998	8.28	8.77	8.28	8.77	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		2/3/1998	7.62	8.11	7.62	8.11	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		1/30/1998	7.33	7.82	7.33	7.82	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		1/21/1998	8.1	8.59				-0.63	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		1/16/1998	8.31	8.8				-0.84	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		1/6/1998	8.64	9.13				-1.17	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/31/1997	8.83	9.32				-1.36	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/19/1997	8.96	9.45				-1.49	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		12/4/1997	8.65	9.14				-1.18	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/25/1997	8.67	9.16				-1.2	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/21/1997	8.71	9.2				-1.24	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/14/1997	8.38	8.87	8.38	8.87	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		11/7/1997	8.65	9.14				-1.18	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/30/1997	8.98	9.47				-1.51	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/24/1997	9.07	9.56				-1.6	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/14/1997	8.86	9.35				-1.39	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/10/1997	8.79	9.28				-1.32	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/7/1997	8.79	9.28				-1.32	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		10/3/1997	8.62	9.11				-1.15	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/30/1997	8.39	8.88	8.39	8.88	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/26/1997	8.38	8.87	8.38	8.87	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/23/1997	8.13	8.62	8.13	8.62	<0.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/18/1997	8.1	8.59	8.07	8.56	0.03	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/16/1997	8.3	8.79	8.22	8.71	0.08	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/12/1997	8.57	9.06	8.4	8.89	0.17	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/9/1997	8.29	8.78	8.25	8.74	0.04	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		9/5/1997	8.31	8.8	8.12	8.61	0.19	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/28/1997	8.15	8.64	7.65	8.14	0.5	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/15/1997	8.27	8.76	7.86	8.35	0.41	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		8/1/1997	8.86	9.35	7.85	8.34	1.01	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/17/1997	8.16	8.65	8.04	8.53	0.12	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		7/1/1997	8.39	8.88	7.78	8.27	0.61	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/20/1997	8.38	8.87	7.67	8.16	0.71	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		6/3/1997	8.29	8.78	7.63	8.12	0.66	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/22/1997	8.41	8.9	7.78	8.27	0.63	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		5/9/1997	8.08	8.57	7.28	7.77	0.8	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/24/1997	8.13	8.62	7.49	7.98	0.64	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-2		4/11/1997	7.83	8.32	7.31	7.8	0.52	NA	7.47	7.964				-	Flush		Temporary	unable to a
WPM-3		5/11/2017	3.34	3.27				4.691	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/11/2016	3.09	3.02				4.94	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/15/2015	3.46	3.39				4.57	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/4/2014	3.41	3.34				4.62	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/14/2014	3.1	3.03				4.93	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/16/2013	3.29	3.22				4.74	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/28/2013						NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/9/2012	0.11	0.04				7.92	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/18/2011						NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/30/2010						NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/22/2009	8.18	8.11				-0.15	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/23/2009	7.33	7.26				0.7	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/25/2008	8.21	8.14				-0.18	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/6/2008	7.11	7.04				0.92	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/15/2007	8.38	8.31				-0.35	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/4/2007	8.16	8.09				-0.13	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/7/2006						NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/24/2006	7.78	7.71				0.25	8.031	7.964				-	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-3		5/19/2005	8.24	8.17				-0.21	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/8/2004	7.99	7.92				0.04	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/17/2004	8.29	8.22				-0.26	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/28/2004	7.95	7.88				0.08	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/10/2004	7.66	7.59				0.37	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/28/2004	7.79	7.72				0.24	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/12/2004	7.76	7.69				0.27	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/29/2004	7.76	7.69				0.27	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/15/2004	7.32	7.25				0.71	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/2/2004	7.97	7.9				0.06	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/17/2004	7.93	7.86				0.1	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/3/2004	8.79	8.72				-0.76	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/17/2004	9.06	8.99				-1.03	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/3/2004	9.15	9.08				-1.12	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/6/2004	7.56	7.49				0.47	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/22/2003	7.51	7.44				0.52	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/25/2003	7.79	7.72				0.24	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/18/2003	7.78	7.71				0.25	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/5/2003	7.71	7.64				0.32	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/22/2003	8	7.93				0.03	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/7/2003	8.31	8.24				-0.28	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/24/2003	7.38	7.31				0.65	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/8/2003	7.9	7.83				0.13	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/27/2003	8.07	8				-0.04	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/12/2003	7.65	7.58				0.38	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/18/2003	8.07	8				-0.04	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/7/2003	7.89	7.82				0.14	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/30/2003	7.8	7.73				0.23	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/17/2003	7.64	7.57				0.39	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/2/2003	7.72	7.65				0.31	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/8/2003	8.09	8.02				-0.06	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/25/2003	8.08	8.01				-0.05	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/9/2003	7.67	7.6				0.36	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/26/2003	7.92	7.85				0.11	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/12/2003	8.14	8.07				-0.11	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/27/2003	8.38	8.31				-0.35	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/13/2003	9.31	9.24				-1.28	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/28/2003	9.37	9.3				-1.34	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/24/2003	9.14	9.07				-1.11	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/30/2002	8.42	8.35				-0.39	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/19/2002	8.33	8.26				-0.3	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/4/2002	8.6	8.53				-0.57	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/18/2002	7.75	7.68				0.28	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/31/2002	7.72	7.65				0.31	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/18/2002	8.25	8.18				-0.22	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/4/2002	8.84	8.77				-0.81	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/17/2002	9.01	8.94				-0.98	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/4/2002	8.94	8.87				-0.91	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/21/2002	9.49	9.42				-1.46	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/12/2002	9.19	9.12				-1.16	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/22/2002	8.52	8.45				-0.49	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/27/2002	8.26	8.19				-0.23	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/14/2002	8.28	8.21				-0.25	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/31/2002	8.32	8.25				-0.29	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/15/2002	8.52	8.45				-0.49	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/1/2002	8.48	8.41				-0.45	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/19/2002	8.73	8.66				-0.7	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/2/2002	8.95	8.88				-0.92	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/19/2002	9.39	9.32				-1.36	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/5/2002	9.39	9.32				-1.36	8.031	7.964				-	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-3		2/19/2002	9.36	9.29				-1.33	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/7/2002	9.26	9.19				-1.23	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/21/2002	9.2	9.13				-1.17	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/9/2002	8.92	8.85				-0.89	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/28/2001	8.88	8.81				-0.85	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/11/2001	9.28	9.21				-1.25	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/27/2001	9.59	9.52				-1.56	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/8/2001	9.45	9.38				-1.42	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/31/2001	9.49	9.42				-1.46	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/17/2001	9.12	9.05				-1.09	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/2/2001	9.41	9.34				-1.38	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/19/2001	9.39	9.32				-1.36	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/5/2001	9.35	9.28				-1.32	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/21/2001	9.22	9.15				-1.19	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/9/2001	8.97	8.9				-0.94	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/26/2001	8.24	8.17	8.24	8.17	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/10/2001	7.76	7.69	7.76	7.69	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/28/2001	8.37	8.3				-0.34	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/13/2001	8.57	8.5				-0.54	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/29/2001	8.33	8.26				-0.3	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/17/2001	8.9	8.83				-0.87	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/3/2001	8.78	8.71				-0.75	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/16/2001	8.45	8.38				-0.42	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/6/2001	8.5	8.43				-0.47	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/20/2001	8.57	8.5				-0.54	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/6/2001	8.24	8.17				-0.21	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/19/2001	8.72	8.65	8.72	8.65	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/6/2001	8.69	8.62	8.69	8.62	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/23/2001	8.9	8.83	8.9	8.83	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/10/2001	8.94	8.87				-0.91	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/12/2000	8.54	8.47				-0.51	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/28/2000	8.4	8.33	8.4	8.33	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/14/2000	8.32	8.25				-0.29	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/31/2000	8.39	8.32				-0.36	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/18/2000	8.6	8.53				-0.57	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/2/2000	7.88	7.81				0.15	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/19/2000	7.93	7.86				0.1	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/6/2000	7.73	7.66	7.73	7.66	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/22/2000	8.08	8.01				-0.05	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/9/2000	7.91	7.84				0.12	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/25/2000	8.13	8.06				-0.1	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/11/2000	8.15	8.08				-0.12	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/27/2000	7.99	7.92				0.04	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/16/2000	8.09	8.02				-0.06	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/31/2000	8.1	8.03	8.1	8.03	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/19/2000	8.06	7.99				-0.03	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/2/2000	8.18	8.11	8.18	8.11	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/20/2000	8.11	8.04				-0.08	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/4/2000	8.42	8.35				-0.39	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/22/2000	8.56	8.49				-0.53	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/9/2000	8.91	8.84	8.91	8.84	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/24/2000	8.97	8.9	8.97	8.9	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/11/2000	8.91	8.84				-0.88	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/26/2000	8.99	8.92	8.99	8.92	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/13/2000	8.72	8.65				-0.69	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/29/1999	8.64	8.57				-0.61	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/14/1999	8.04	7.97				-0.01	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/1/1999	8.54	8.47				-0.51	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/18/1999	8.68	8.61				-0.65	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/3/1999	8.1	8.03				-0.07	8.031	7.964				-	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-3		10/20/1999	7.97	7.9				0.06	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/7/1999	8.07	8				-0.04	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/24/1999	7.44	7.37	7.44	7.37	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/9/1999	8.12	8.05				-0.09	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/27/1999	8.22	8.15				-0.19	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/12/1999	8.92	8.85	8.92	8.85	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/30/1999	8.65	8.58	8.62	8.55	0.03	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/13/1999	8.62	8.55				-0.59	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/30/1999	8.43	8.36				-0.4	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/15/1999	8.37	8.3				-0.34	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/2/1999	8.21	8.14				-0.18	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/20/1999	8.18	8.11				-0.15	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/4/1999	8.38	8.31				-0.35	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/20/1999	8.34	8.27				-0.31	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/12/1999	8.44	8.37				-0.41	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/25/1999	8.52	8.45				-0.49	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/11/1999	8.6	8.53	8.6	8.53	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/2/1999	8.78	8.71	8.78	8.71	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/9/1999	8.75	8.68	8.75	8.68	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/29/1999	8.93	8.86	8.93	8.86	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/15/1999	8.84	8.77	8.84	8.77	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/30/1998	9.04	8.97				-1.01	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/17/1998	8.93	8.86	8.93	8.86	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/4/1998	8.88	8.81	8.88	8.81	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/20/1998	8.91	8.84				-0.88	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/4/1998	8.87	8.8				-0.84	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/23/1998	8.68	8.61				-0.65	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/9/1998	8.51	8.44				-0.48	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/25/1998	8.74	8.67				-0.71	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/10/1998	8.57	8.5	8.57	8.5	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/28/1998	8.42	8.35	8.42	8.35	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/13/1998	8.41	8.34	8.41	8.34	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/31/1998	8.23	8.16				-0.2	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/16/1998	8.1	8.03				-0.07	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/2/1998	8.02	7.95				0.01	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/19/1998	7.9	7.83				0.13	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/5/1998	8.1	8.03				-0.07	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		5/21/1998	8.21	8.14				-0.18	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/23/1998	8.08	8.01				-0.05	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		4/10/1998	8.22	8.15				-0.19	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/27/1998	8.32	8.25	8.32	8.25	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		3/12/1998	8.39	8.32	8.39	8.32	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/27/1998	8.38	8.31	8.38	8.31	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		2/10/1998	8.52	8.45	8.52	8.45	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/30/1998	8.32	8.25	8.29	8.22	0.03	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		1/16/1998	8.54	8.47	8.54	8.47	<0.01	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/19/1997	8.53	8.46				-0.5	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		12/4/1997	8.28	8.21				-0.25	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/21/1997	8.43	8.36				-0.4	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		11/7/1997	8.4	8.33				-0.37	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/24/1997	8.83	8.76				-0.8	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		10/10/1997	8.7	8.63				-0.67	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/26/1997	8.39	8.32				-0.36	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		9/12/1997	8.11	8.04				-0.08	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/28/1997	7.76	7.69	7.68	7.61	0.08	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/15/1997	7.95	7.88	7.85	7.78	0.1	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		8/1/1997	7.95	7.88	7.78	7.71	0.17	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/17/1997	8.1	8.03	8.01	7.94	0.09	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		7/1/1997	7.83	7.76	7.75	7.68	0.08	NA	8.031	7.964				-	Stick Up		Temporary Well Point	
WPM-3		6/20/1997	7.85	7.78	7.79	7.72	0.06	NA	8.031	7.964				-	Stick Up		Temporary Well Point	

Table 3

LNAPL Monitoring Well Historical Summary Data
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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-3		6/3/1997	7.96	7.89	7.81	7.74	0.15	NA	8.031	7.964				-	Stick Up		Temporary	Well Point
WPM-3		5/22/1997	8.23	8.16	8.04	7.97	0.19	NA	8.031	7.964				-	Stick Up		Temporary	Well Point
WPM-3		5/9/1997	7.99	7.92	7.78	7.71	0.21	NA	8.031	7.964				-	Stick Up		Temporary	Well Point
WPM-3		4/24/1997	8.21	8.14	7.88	7.81	0.33	NA	8.031	7.964				-	Stick Up		Temporary	Well Point
WPM-3		4/11/1997	8.61	8.54	8.02	7.95	0.59	NA	8.031	7.964				-	Stick Up		Temporary	Well Point
WPM-4		11/25/2008						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		5/19/2005	8.3	7.25				5.76	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		9/17/2004						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/28/2004	5.5	4.45				8.56	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		3/3/2004						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		11/25/2003	7.32	6.27				6.74	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		11/18/2003	7.28	6.23				6.78	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		8/27/2003						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		7/7/2003						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		3/12/2003	6.17	5.12				7.89	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		8/12/2002	5.15	4.1				8.91	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/14/2002	5.1	4.05				8.96	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		2/19/2002	5.05	4				9.01	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		11/8/2001	8.9	7.85				5.16	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		9/5/2001	5.05	4				9.01	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/13/2001	5.1	4.05				8.96	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		2/19/2001						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		11/14/2000						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		9/6/2000						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/16/2000						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		3/9/2000						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		11/18/1999						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		9/24/1999						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/15/1999						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		3/11/1999						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		12/17/1998						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		9/10/1998						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/19/1998						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		3/27/1998						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		12/19/1997						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		9/26/1997						NA	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		7/17/1997	7.24	6.19				6.82	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		7/1/1997	7.26	6.21				6.8	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/20/1997	7.24	6.19				6.82	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		6/3/1997	6.77	5.72				7.29	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		5/22/1997	7.22	6.17				6.84	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		5/9/1997	6.86	5.81				7.2	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		4/24/1997	6.97	5.92				7.09	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-4		4/11/1997	7.06	6.01				7	14.06	13.01				-	Stick Up		Temporary	Destroyed
WPM-5		6/6/2008						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/15/2007	5.18	4.13				9	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/4/2007						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/7/2006						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		5/24/2006	6.01	4.96				8.17	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		5/19/2005	7.84	6.79				6.34	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		10/8/2004	6.96	5.91				7.22	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		9/17/2004	7.34	6.29				6.84	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/28/2004	7.02	5.97				7.16	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		3/3/2004	7.77	6.72				6.41	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/25/2003						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/18/2003						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		8/27/2003	7.08	6.03				7.1	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		7/7/2003	7.12	6.07				7.06	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		3/12/2003						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		8/12/2002	7.65	6.6				6.53	14.18	13.13				-	Stick Up		Temporary	Destroyed

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Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-5		6/14/2002	6.05	5				8.13	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		2/19/2002	7.9	6.85				6.28	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/8/2001						NA	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		9/5/2001	8.32	7.27				5.86	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/13/2001	7.06	6.01				7.12	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		2/19/2001	6.47	5.42				7.71	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/14/2000	8.17	7.12				6.01	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		9/6/2000	5.96	4.91				8.22	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/16/2000	5.96	4.91				8.22	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		3/9/2000	7.66	6.61				6.52	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		11/18/1999	8.52	7.47				5.66	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		9/24/1999	6.02	4.97				8.16	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/15/1999	7.07	6.02				7.11	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		3/11/1999	6.45	5.4				7.73	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		12/17/1998	8.5	7.45				5.68	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		9/10/1998	7.85	6.8				6.33	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/19/1998	6.27	5.22				7.91	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		3/27/1998	6.82	5.77				7.36	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		12/19/1997	8.21	7.16				5.97	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		9/26/1997	7.81	6.76				6.37	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		7/17/1997	7.78	6.73				6.4	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		7/1/1997	7.87	6.82				6.31	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/20/1997	7.73	6.68				6.45	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		6/3/1997	5.91	4.86				8.27	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		5/22/1997	7.44	6.39				6.74	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		5/9/1997	6.39	5.34				7.79	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		4/24/1997	6.53	5.48				7.65	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-5		4/11/1997	7.39	6.34				6.79	14.18	13.13				-	Stick Up		Temporary	Destroyed
WPM-6		11/25/2008						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/6/2008						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/15/2007						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/4/2007						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/7/2006						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		5/24/2006						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		5/19/2005						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		10/8/2004	7.85	6.8				6.5	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/17/2004						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/28/2004						NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/3/2004	6.33	5.28				8.02	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/25/2003	6.95	5.9				7.4	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/18/2003	6.93	5.88				7.42	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		8/27/2003	7.44	6.39				6.91	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		7/7/2003	7.13	6.08				7.22	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/12/2003	6.64	5.59				7.71	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		10/31/2002	6.37	5.32				7.98	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		8/12/2002	7.75	6.7				6.6	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/14/2002	7.2	6.15				7.15	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		2/19/2002	7.4	6.35				6.95	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/8/2001	8.66	7.61				5.69	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/5/2001	8.42	7.37				5.93	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/13/2001	7.1	6.05				7.25	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		2/19/2001	6.61	5.56				7.74	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/14/2000	7.38	6.33				6.97	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/6/2000	6.86	5.81				7.49	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/16/2000	7.25	6.2				7.1	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/9/2000	7	5.95				7.35	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		11/18/1999	7.16	6.11				7.19	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/24/1999	6.72	5.67	6.72	5.67	<0.01	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/9/1999	7.56	6.51				6.79	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		8/27/1999	7.67	6.62				6.68	14.35	13.3				-	Stick Up		Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-6		8/12/1999	7.72	6.67				6.63	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		7/30/1999	7.55	6.5				6.8	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		7/13/1999	7.38	6.33				6.97	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/30/1999	7.28	6.23				7.07	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/15/1999	7.15	6.1				7.2	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/2/1999	6.95	5.9				7.4	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		5/20/1999	7.15	6.1				7.2	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		5/4/1999	6.95	5.9				7.4	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		4/20/1999	6.78	5.73				7.57	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		4/12/1999	6.47	5.42				7.88	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/25/1999	6.37	5.32				7.98	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/11/1999	6.56	5.51				7.79	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/2/1999	6.67	5.62	6.67	5.62	<0.01	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		2/9/1999	6.54	5.49	6.54	5.49	<0.01	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		1/29/1999	6.73	5.68				7.62	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		1/15/1999	7.71	6.66				6.64	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		12/17/1998	8.31	7.26	8.1	7.05	0.21	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/10/1998	7.74	6.69	7.74	6.69	<0.01	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/19/1998	6.97	5.92	6.97	5.92	<0.01	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		3/27/1998	6.39	5.34				7.96	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		12/19/1997	7.19	6.14				7.16	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		9/26/1997	7.38	6.33				6.97	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		7/17/1997	7.34	6.29				7.01	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		7/1/1997	7.15	6.1				7.2	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/20/1997	7.07	6.02				7.28	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		6/3/1997	6.88	5.83				7.47	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		5/22/1997	6.89	5.84				7.46	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		5/9/1997	6.73	5.68				7.62	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		4/24/1997	6.73	5.68				7.62	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-6		4/11/1997	6.68	5.63	6.68	5.63	<0.01	NA	14.35	13.3				-	Stick Up		Temporary	Destroyed
WPM-7		11/25/2008						NA		14.68				-			Temporary	Destroyed
WPM-7		6/6/2008						NA		14.68				-			Temporary	Destroyed
WPM-7		11/15/2007						NA		14.68				-			Temporary	Destroyed
WPM-7		6/4/2007						NA		14.68				-			Temporary	Destroyed
WPM-7		11/7/2006						NA		14.68				-			Temporary	Destroyed
WPM-7		5/24/2006						NA		14.68				-			Temporary	Destroyed
WPM-7		5/19/2005						NA		14.68				-			Temporary	Destroyed
WPM-7		10/8/2004						NA		14.68				-			Temporary	Destroyed
WPM-7		9/17/2004						NA		14.68				-			Temporary	Destroyed
WPM-7		6/28/2004	7.64					NA		14.68				-			Temporary	Destroyed
WPM-7		3/3/2004	8.37					NA		14.68				-			Temporary	Destroyed
WPM-7		11/25/2003	7.68					NA		14.68				-			Temporary	Destroyed
WPM-7		11/18/2003	7.7					NA		14.68				-			Temporary	Destroyed
WPM-7		8/27/2003	8.2					NA		14.68				-			Temporary	Destroyed
WPM-7		7/7/2003						NA		14.68				-			Temporary	Destroyed
WPM-7		3/12/2003	7.26					NA		14.68				-			Temporary	Destroyed
WPM-7		10/31/2002						NA		14.68				-			Temporary	Destroyed
WPM-7		8/12/2002	8.92					NA		14.68				-			Temporary	Destroyed
WPM-7		6/14/2002	8.11					NA		14.68				-			Temporary	Destroyed
WPM-7		2/19/2002	8.77					NA		14.68				-			Temporary	Destroyed
WPM-7		11/8/2001	9.51					NA		14.68				-			Temporary	Destroyed
WPM-7		9/5/2001	9.12					NA		14.68				-			Temporary	Destroyed
WPM-7		6/13/2001	7.83					NA		14.68				-			Temporary	Destroyed
WPM-7		2/19/2001						NA		14.68				-			Temporary	Destroyed
WPM-7		11/14/2000	8.56					NA		14.68				-			Temporary	Destroyed
WPM-7		9/6/2000	7.69					NA		14.68				-			Temporary	Destroyed
WPM-7		6/16/2000	8.17					NA		14.68				-			Temporary	Destroyed
WPM-7		3/9/2000	8.18					NA		14.68				-			Temporary	Destroyed
WPM-7		11/18/1999	8.31					NA		14.68				-			Temporary	Destroyed
WPM-7		9/24/1999	6.99					NA		14.68				-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-7		6/15/1999	8.29					NA		14.68				-			Temporary	Destroyed
WPM-7		3/11/1999	7.83					NA		14.68				-			Temporary	Destroyed
WPM-7		12/17/1998	9.28					NA		14.68				-			Temporary	Destroyed
WPM-7		9/10/1998	8.73					NA		14.68				-			Temporary	Destroyed
WPM-7		6/19/1998	7.73					NA		14.68				-			Temporary	Destroyed
WPM-7		3/27/1998	7.46					NA		14.68				-			Temporary	Destroyed
WPM-7		12/19/1997	8.5					NA		14.68				-			Temporary	Destroyed
WPM-7		9/26/1997	8.45					NA		14.68				-			Temporary	Destroyed
WPM-7		7/17/1997	8.93					NA		14.68				-			Temporary	Destroyed
WPM-7		7/1/1997	8.55					NA		14.68				-			Temporary	Destroyed
WPM-7		6/20/1997	8.41					NA		14.68				-			Temporary	Destroyed
WPM-7		6/3/1997	8.14					NA		14.68				-			Temporary	Destroyed
WPM-7		5/22/1997	8.25					NA		14.68				-			Temporary	Destroyed
WPM-7		5/9/1997	7.84					NA		14.68				-			Temporary	Destroyed
WPM-7		4/24/1997	7.84					NA		14.68				-			Temporary	Destroyed
WPM-7		4/11/1997	7.81					NA		14.68				-			Temporary	Destroyed
WPM-8	RWM-8	5/18/2011						NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/30/2010						NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/22/2009	8.67					3.94	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/25/2008	8.7					3.91	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/6/2008	7.93					4.68	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/15/2007	8.62					3.99	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/4/2007	8.25					4.36	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/7/2006						NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/24/2006	8.3					4.31	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/19/2005	8.18					4.43	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/8/2004	8.02					4.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/17/2004	8.21					4.4	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/28/2004	7.97					4.64	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/10/2004	7.9					4.71	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/28/2004	7.87					4.74	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/12/2004	8.88					3.73	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/29/2004	7.93					4.68	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/15/2004	7.89					4.72	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/2/2004	8.21					4.4	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/17/2004	8.58					4.03	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/3/2004	9.1					3.51	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/17/2004	9.22					3.39	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/3/2004	9.25					3.36	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/6/2004	8.27					4.34	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/22/2003	8.12					4.49	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/25/2003	8.15					4.46	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/18/2003	8.16					4.45	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/5/2003	8.03					4.58	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/22/2003	8.19					4.42	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/7/2003	8.15					4.46	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/24/2003	7.82					4.79	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/8/2003	8.13					4.48	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/27/2003	8.15					4.46	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/12/2003	7.94					4.67	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/18/2003	8					4.61	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/7/2003	7.87					4.74	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/30/2003	7.82					4.79	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/17/2003	7.79					4.82	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/2/2003	8.02					4.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/8/2003	8.14					4.47	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/25/2003	8.02					4.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/9/2003	8.03					4.58	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/26/2003	8.01					4.6	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/12/2003	8.3					4.31	12.61					-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-8	RWM-8	2/27/2003	8.69					3.92	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/13/2003	9.24					3.37	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/28/2003	9.07					3.54	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/24/2003	9					3.61	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/30/2002	8.55					4.06	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/19/2002	8.49					4.12	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/4/2002	8.53					4.08	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/18/2002	7.96					4.65	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/31/2002	8.07					4.54	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/18/2002	8.25					4.36	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/4/2002	8.7					3.91	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/17/2002	8.78					3.83	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/4/2002	8.83					3.78	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/21/2002	9.03					3.58	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/12/2002	8.87					3.74	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/22/2002	8.41					4.2	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/27/2002	8.07					4.54	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/14/2002	8.06					4.55	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/31/2002	8.16					4.45	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/15/2002	8.3					4.31	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/1/2002	8.3					4.31	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/19/2002	8.49					4.12	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/2/2002	8.69					3.92	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/19/2002	9.24					3.37	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/5/2002	9.32					3.29	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/19/2002	9.31					3.3	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/7/2002	9.28					3.33	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/21/2002	9.43					3.18	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/9/2002	9.31					3.3	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/28/2001	9.15					3.46	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/11/2001	9.47					3.14	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/27/2001	9.44					3.17	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/8/2001	9.22					3.39	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/31/2001	9.17					3.44	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/17/2001	9					3.61	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/2/2001	9.02					3.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/19/2001	9.05					3.56	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/5/2001	8.93					3.68	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/21/2001	8.77					3.84	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/9/2001	8.62					3.99	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/26/2001	8.21					4.4	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/10/2001	7.1					5.51	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/28/2001	7.91					4.7	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/13/2001	8.02					4.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/29/2001	7.96					4.65	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/17/2001	8.41					4.2	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/3/2001	8.21					4.4	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/16/2001	8.03					4.58	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/6/2001	8.09					4.52	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/20/2001	8.36					4.25	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/6/2001	8.17					4.44	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/19/2001	8.82					3.79	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/6/2001	9.02					3.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/23/2001	9.29					3.32	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/10/2001	9.37					3.24	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/12/2000	9.01					3.6	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/28/2000	8.85					3.76	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/14/2000	8.64					3.97	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/31/2000	8.47					4.14	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/18/2000	8.13		8.13		<0.01	NA	12.61					-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-8	RWM-8	10/2/2000	7.82					4.79	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/19/2000	7.95					4.66	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/6/2000	7.93					4.68	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/22/2000	8.02					4.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/9/2000	7.88					4.73	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/25/2000	8.07					4.54	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/11/2000	8.08					4.53	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/27/2000	7.93					4.68	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/16/2000	7.97					4.64	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/31/2000	8.01		8.01		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/19/2000	8.04					4.57	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/2/2000	8.06					4.55	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/20/2000	7.99					4.62	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/4/2000	7.98					4.63	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/22/2000	8.21					4.4	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/9/2000	8.75					3.86	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/24/2000	9.08					3.53	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/11/2000	9.42					3.19	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/26/2000	9.14					3.47	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/13/2000	9					3.61	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/29/1999	8.55					4.06	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/14/1999	8.56					4.05	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/1/1999	8.76					3.85	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/18/1999	8.81					3.8	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/3/1999	8.03		8.03		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/20/1999	8.12		8.12		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/7/1999	8.04					4.57	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/24/1999	7.82		7.82		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/9/1999	8.18					4.43	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/27/1999	8.44		8.44		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/12/1999	8.9					3.71	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/30/1999	8.6		8.55		0.05	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/13/1999	8.47		8.46		0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/30/1999	8.26		8.26		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/15/1999	8.11		8.11		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/2/1999	8.03					4.58	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/20/1999	8.18		8.18		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/4/1999	8.03		8.03		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/20/1999	8.02					4.59	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/12/1999	8.06		8.06		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/25/1999	8.32		8.32		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/11/1999	8.55		8.55		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/2/1999	8.75		8.73		0.02	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	2/9/1999	9.03					3.58	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/29/1999	9.17					3.44	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	1/15/1999	9.6					3.01	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/30/1998	9.41					3.2	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/17/1998	9.33					3.28	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/4/1998	9.31					3.3	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/20/1998	9.21					3.4	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	11/4/1998	9					3.61	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/23/1998	8.91		8.91		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	10/9/1998	8.96		8.96		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/25/1998	8.8		8.8		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/10/1998	8.81		8.66		0.15	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/28/1998	8.82		8.4		0.42	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	8/13/1998	8.83		8.44		0.39	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/31/1998	8.79		8.36		0.43	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/16/1998	8.19		8.16		0.03	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/2/1998	8.16		8.05		0.11	NA	12.61					-			Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-8	RWM-8	6/19/1998	7.98		7.92		0.06	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/5/1998	8.13		8.02		0.11	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/21/1998	7.98		7.96		0.02	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/23/1998	7.95		7.95		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/10/1998	8.15		8.1		0.05	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	3/27/1998	8.16		8.05		0.11	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	12/19/1997	9.09					3.52	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	9/26/1997	8.28					4.33	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/17/1997	8.39					4.22	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	7/1/1997	8.19					4.42	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/20/1997	8.17					4.44	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	6/3/1997	8.08					4.53	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/22/1997	8.17					4.44	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	5/9/1997	7.95		7.95		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/24/1997	8.01		8.01		<0.01	NA	12.61					-			Temporary	Destroyed
WPM-8	RWM-8	4/11/1997	8.41		8.11		0.3	NA	12.61					-			Temporary	Destroyed
WPM-9		6/6/2008						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/15/2007						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/4/2007						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/7/2006						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/24/2006						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/19/2005						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/8/2004	3.62	2.57				12.88	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/17/2004	8.2	7.15	8.19	7.14	0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/28/2004	7.94	6.89	7.94	6.89	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/10/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/28/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/12/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/29/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/15/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/2/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/17/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/3/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/17/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/3/2004						NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/6/2004	8.32	7.27				8.18	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/22/2003	8.56	7.51				7.94	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/25/2003	8.44	7.39				8.06	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/18/2003	8.41	7.36				8.09	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/5/2003	7.75	6.7	7.75	6.7	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/22/2003	8.41	7.36	8.41	7.36	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/7/2003	8.29	7.24	8.29	7.24	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/24/2003	8.01	6.96	8.01	6.96	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/8/2003	8.4	7.35	8.4	7.35	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/27/2003	8.5	7.45	8.5	7.45	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/12/2003	8.2	7.15	8.19	7.14	0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/18/2003	8.42	7.37	8.42	7.37	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/7/2003	8.14	7.09				8.36	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/30/2003	7.97	6.92	7.97	6.92	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/17/2003	7.69	6.64	7.69	6.64	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/2/2003	7.8	6.75	7.73	6.68	0.07	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/8/2003	8.37	7.32	8.37	7.32	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/25/2003	7.97	6.92	7.97	6.92	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/9/2003	8.25	7.2	8.25	7.2	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/26/2003	8.03	6.98				8.47	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/12/2003	8.64	7.59				7.86	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/27/2003	9.03	7.98				7.47	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/13/2003	9.69	8.64	9.69	8.64	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/28/2003	9.33	8.28				7.17	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/24/2003	9.55	8.5				6.95	16.5	15.45				-	Stick Up		Temporary	Destroyed

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WPM-9		12/30/2002	8.79	7.74				7.71	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/19/2002	8.75	7.7				7.75	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/4/2002	8.68	7.63	8.68	7.63	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/18/2002	8.21	7.16	8.21	7.16	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/31/2002	8.17	7.12	8.17	7.12	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/18/2002	8.42	7.37	8.41	7.36	0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/4/2002	8.85	7.8	8.82	7.77	0.03	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/17/2002	9.03	7.98	8.95	7.9	0.08	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/4/2002	8.95	7.9	8.89	7.84	0.06	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/21/2002	9.3	8.25	9.24	8.19	0.06	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/12/2002	9.22	8.17	9.15	8.1	0.07	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/22/2002	8.72	7.67	8.58	7.53	0.14	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/27/2002	8.32	7.27	8.31	7.26	0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/14/2002	8.7	7.65	8.58	7.53	0.12	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/31/2002	8.48	7.43	8.28	7.23	0.2	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/15/2002	8.71	7.66	8.53	7.48	0.18	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/1/2002	8.81	7.76	8.68	7.63	0.13	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/19/2002	8.91	7.86	8.75	7.7	0.16	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/2/2002	8.99	7.94	8.73	7.68	0.26	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/19/2002	9.8	8.75	9.35	8.3	0.45	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/5/2002	10	8.95	9.45	8.4	0.55	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/19/2002	10	8.95	9.43	8.38	0.57	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/7/2002	9.53	8.48	9.27	8.22	0.26	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/21/2002	9.99	8.94	9.42	8.37	0.57	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/9/2002	10.1	9.05	9.44	8.39	0.66	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/28/2001	9.41	8.36	9.25	8.2	0.16	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/11/2001	10.14	9.09	9.51	8.46	0.63	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/27/2001	10.08	9.03	9.46	8.41	0.62	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/8/2001	9.41	8.36	9.41	8.36	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/31/2001	9.35	8.3	9.35	8.3	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/17/2001	9.16	8.11				7.34	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/2/2001	9.24	8.19	9.24	8.19	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/19/2001	9.2	8.15	9.2	8.15	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/5/2001	9.19	8.14	9.19	8.14	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/21/2001	9.01	7.96				7.49	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/9/2001	8.87	7.82				7.63	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/26/2001	8.57	7.52				7.93	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/10/2001	8.17	7.12	8.17	7.12	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/28/2001	8.07	7.02				8.43	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/13/2001	8.31	7.26	8.31	7.26	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/29/2001	8.12	7.07	8.12	7.07	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/17/2001	8.71	7.66	8.71	7.66	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/3/2001	8.46	7.41	8.46	7.41	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/16/2001	8.18	7.13	8.18	7.13	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/6/2001	8.31	7.26				8.19	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/20/2001	8.61	7.56	8.61	7.56	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/6/2001	8.52	7.47				7.98	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/19/2001	8.89	7.84	8.76	7.71	0.13	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/6/2001	9.1	8.05	8.95	7.9	0.15	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/23/2001	9.32	8.27	9.14	8.09	0.18	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/10/2001	10.07	9.02	9.6	8.55	0.47	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/12/2000	9.16	8.11				7.34	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/28/2000	8.98	7.93				7.52	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/14/2000	8.95	7.9				7.55	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/31/2000	8.75	7.7				7.75	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/18/2000	8.35	7.3				8.15	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/2/2000	8.05	7				8.45	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/19/2000	8.13	7.08				8.37	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/6/2000	8.22	7.17				8.28	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/22/2000	8.31	7.26	8.31	7.26	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-9		8/9/2000	8.13	7.08				8.37	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/25/2000	8.34	7.29				8.16	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/11/2000	8.42	7.37				8.08	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/27/2000	8.17	7.12	8.17	7.12	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/16/2000	8.26	7.21	8.26	7.21	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/31/2000	8.14	7.09	8.14	7.09	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/19/2000	8.25	7.2	8.25	7.2	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/2/2000	8.17	7.12				8.33	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/20/2000	8.13	7.08	8.13	7.08	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/4/2000	8.17	7.12	8.17	7.12	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/22/2000	8.54	7.49	8.42	7.37	0.12	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/9/2000	9.26	8.21	8.98	7.93	0.28	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/24/2000	9.34	8.29	9.26	8.21	0.08	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/11/2000	10.58	9.53	9.52	8.47	1.06	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/26/2000	10.47	9.42	9.58	8.53	0.89	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/13/2000	9.09	8.04	9.09	8.04	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/29/1999	9.27	8.22				7.23	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/14/1999	8.72	7.67				7.78	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/1/1999	8.97	7.92				7.53	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/18/1999	8.95	7.9				7.55	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/3/1999	8.37	7.32	8.37	7.32	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/20/1999	8.34	7.29	8.34	7.29	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/7/1999	8.21	7.16	8.21	7.16	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/24/1999	7.91	6.86	7.91	6.86	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/9/1999	8.51	7.46	8.51	7.46	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/27/1999	8.95	7.9	8.74	7.69	0.21	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/12/1999	9.47	8.42	9.23	8.18	0.24	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/30/1999	8.83	7.78	8.81	7.76	0.02	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/13/1999	8.83	7.78	8.83	7.78	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/30/1999	8.61	7.56	8.61	7.56	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/15/1999	8.45	7.4	8.44	7.39	0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/2/1999	8.11	7.06	8.11	7.06	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/20/1999	8.26	7.21	8.26	7.21	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/4/1999	8.31	7.26	8.28	7.23	0.03	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/20/1999	8.23	7.18	8.13	7.08	0.1	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/12/1999	8.43	7.38	8.28	7.23	0.15	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/25/1999	8.87	7.82	8.55	7.5	0.32	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/11/1999	9.1	8.05	8.77	7.72	0.33	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/2/1999	9.35	8.3	9.12	8.07	0.23	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/9/1999	9.07	8.02				7.43	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/29/1999	9.36	8.31	9.36	8.31	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/15/1999	10.44	9.39	9.53	8.48	0.91	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/30/1998	10.58	9.53	9.55	8.5	1.03	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/17/1998	10.25	9.2	9.35	8.3	0.9	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/4/1998	10.39	9.34	9.35	8.3	1.04	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/20/1998	9.75	8.7	9.25	8.2	0.5	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/4/1998	9.33	8.28	9.25	8.2	0.08	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/23/1998	9.19	8.14	9.19	8.14	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/9/1998	9.07	8.02	9.07	8.02	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/25/1998	8.92	7.87	8.92	7.87	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/10/1998	8.89	7.84				7.61	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/28/1998	9.73	8.68				6.77	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/13/1998	8.77	7.72	8.77	7.72	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/31/1998	8.79	7.74	8.78	7.73	0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/21/1998	8.6	7.55	8.6	7.55	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/16/1998	8.44	7.39	8.44	7.39	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/9/1998	8.33	7.28				8.17	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/2/1998	8.48	7.43	8.48	7.43	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/24/1998	8.21	7.16	8.21	7.16	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/19/1998	8.15	7.1	8.15	7.1	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed

Table 3

LNAPL Monitoring Well Historical Summary Data
Philadelphia Refining Complex, AOI 6

Well ID	Former Well ID	Measurement Date	Depth to Water (ft btoc)	Depth to Water from Grade	Depth to LNAPL	Depth to LNAPL from Grade	Product Thickness	Corrected Water Level Elevation	Top of Casing Elevation	Ground Surface Elevation	Total Depth of Well	Reference Well ID	Product Density	Product Description	Flush/Stick-up	Recovery Well	Well Type	Well Status
WPM-9		6/11/1998	8.55	7.5	8.55	7.5	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/5/1998	8.34	7.29	8.34	7.29	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/29/1998	8.29	7.24	8.29	7.24	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/21/1998	8.14	7.09	8.14	7.09	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/20/1998	7.76	6.71	7.76	6.71	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/14/1998	7.92	6.87	7.92	6.87	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/28/1998	8.38	7.33	8.38	7.33	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/23/1998	7.93	6.88	7.93	6.88	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/15/1998	8.27	7.22	8.27	7.22	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/10/1998	8.47	7.42	8.35	7.3	0.12	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/2/1998	8.27	7.22	8.27	7.22	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/27/1998	8.36	7.31	8.36	7.31	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/19/1998	8.32	7.27	8.32	7.27	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/12/1998	8.25	7.2	8.25	7.2	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		3/6/1998	8.47	7.42	8.29	7.24	0.18	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/27/1998	8.5	7.45	8.21	7.16	0.29	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/18/1998	8.83	7.78	8.3	7.25	0.53	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/10/1998	9.02	7.97	8.57	7.52	0.45	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		2/3/1998	9.06	8.01	8.65	7.6	0.41	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/30/1998	8.97	7.92	8.38	7.33	0.59	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/21/1998	9.34	8.29	8.83	7.78	0.51	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/16/1998	9.58	8.53	8.74	7.69	0.84	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		1/6/1998	10.11	9.06	9.09	8.04	1.02	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/31/1997	10.07	9.02	9.1	8.05	0.97	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/19/1997	10.41	9.36	9.15	8.1	1.26	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		12/4/1997	9.52	8.47	9.52	8.47	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/25/1997	9.17	8.12	9.17	8.12	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/21/1997	9.11	8.06	9.11	8.06	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/14/1997	8.67	7.62	8.64	7.59	0.03	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		11/7/1997	9.06	8.01	8.81	7.76	0.25	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/30/1997	9.46	8.41	9.41	8.36	0.05	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/24/1997	9.6	8.55	9.51	8.46	0.09	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/14/1997	9.18	8.13	9.18	8.13	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/10/1997	9.05	8	9.05	8	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/7/1997	8.98	7.93	8.98	7.93	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		10/3/1997	8.87	7.82	8.87	7.82	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/30/1997	8.64	7.59	8.64	7.59	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/26/1997	8.67	7.62	8.67	7.62	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/23/1997	8.43	7.38				8.07	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/18/1997	8.33	7.28				8.17	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/16/1997	8.46	7.41	8.46	7.41	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/12/1997	8.46	7.41	8.46	7.41	<0.01	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/9/1997	8.61	7.56	8.53	7.48	0.08	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		9/5/1997	8.65	7.6	8.35	7.3	0.3	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/28/1997	8.67	7.62	8.12	7.07	0.55	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/15/1997	8.75	7.7	8.04	6.99	0.71	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		8/1/1997	8.67	7.62	8.18	7.13	0.49	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/17/1997	8.98	7.93	8.38	7.33	0.6	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		7/1/1997	8.65	7.6	8.08	7.03	0.57	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/20/1997	8.55	7.5	8.08	7.03	0.47	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		6/3/1997	8.54	7.49	7.97	6.92	0.57	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/22/1997	8.76	7.71	8.14	7.09	0.62	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		5/9/1997	8.48	7.43	7.9	6.85	0.58	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/24/1997	8.29	7.24	7.91	6.86	0.38	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed
WPM-9		4/11/1997	8.47	7.42	7.83	6.78	0.64	NA	16.5	15.45				-	Stick Up		Temporary	Destroyed

Table 4

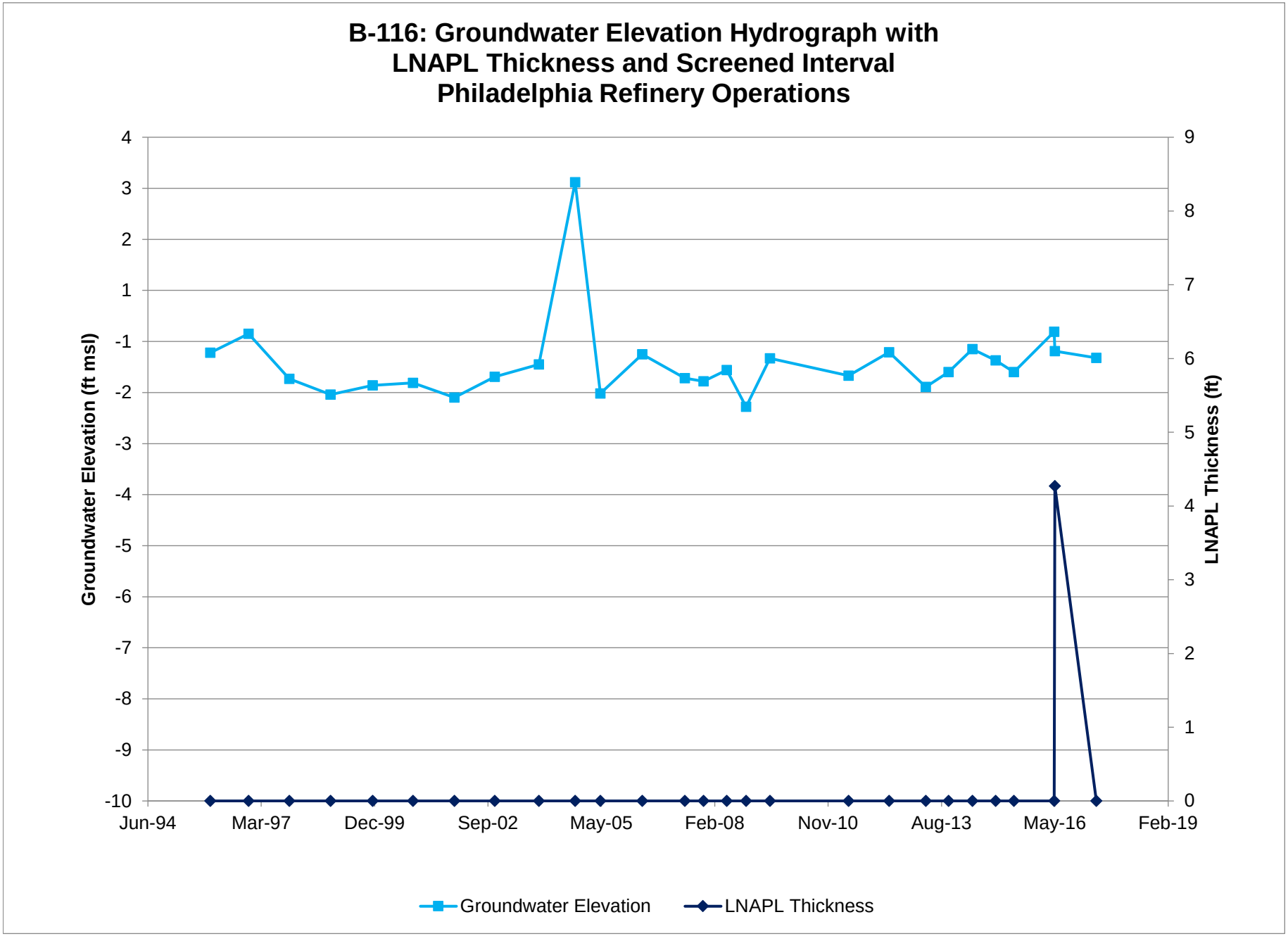
Summary of Well Gauging
Philadelphia Refining Complex, AOI 6

Year	Number of Well Gauged	Number of wells with NAPL	% of Wells Gauged with LNAPL
1995	22	6	27%
1996	25	7	28%
1997	45	17	38%
1998	44	14	32%
1999	42	15	36%
2000	41	15	37%
2001	60	27	45%
2002	57	29	51%
2003	63	28	44%
2004	61	27	44%
2005	62	28	45%
2006	86	30	35%
2007	86	28	33%
2008	95	24	25%
2009	68	24	35%
2010	73	24	33%
2011	73	25	34%
2012	71	22	31%
2013	80	26	33%
2014	79	24	30%
2015	79	23	29%
2016	84	26	31%
2017	95	21	22%

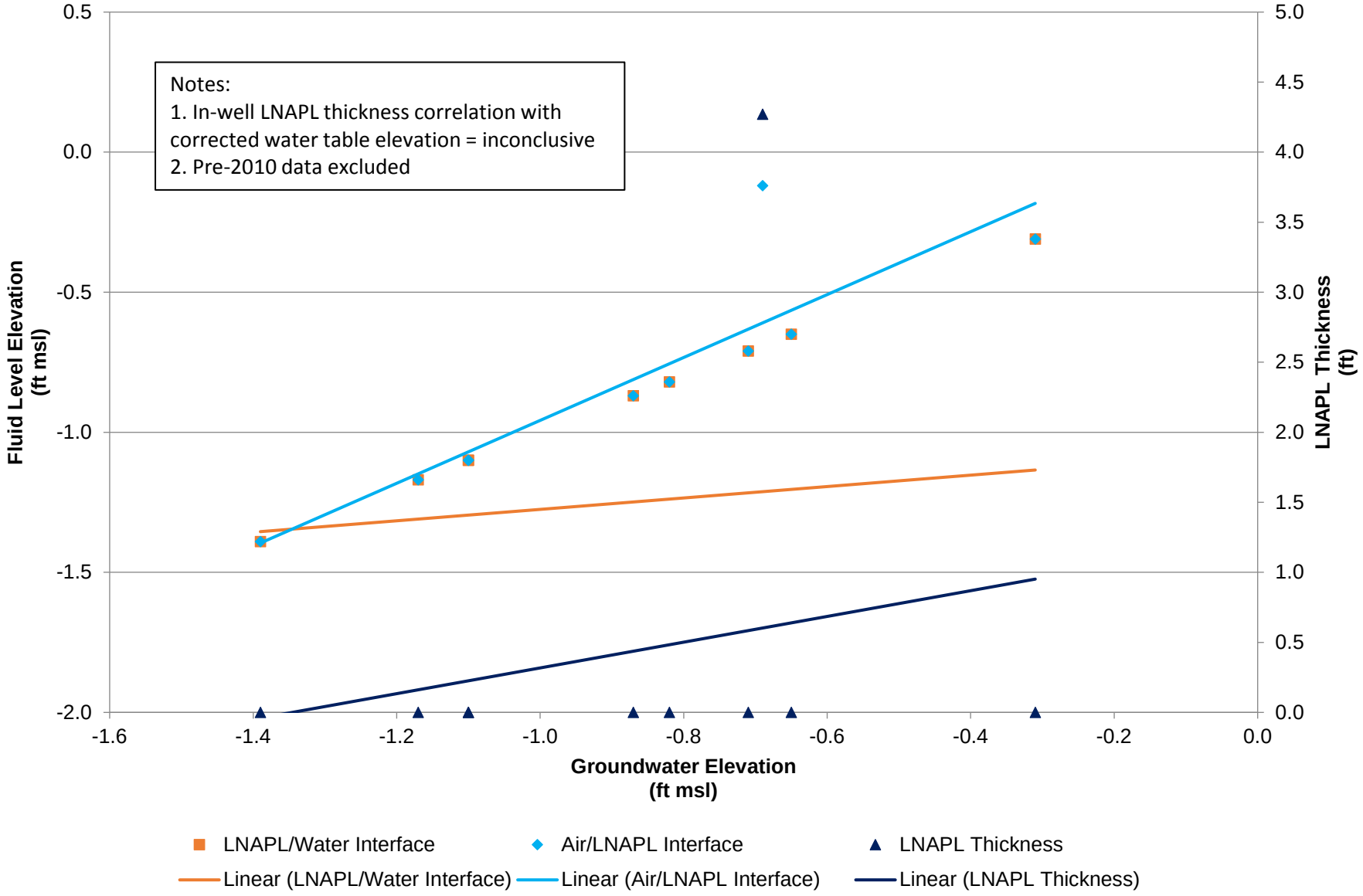
Notes:

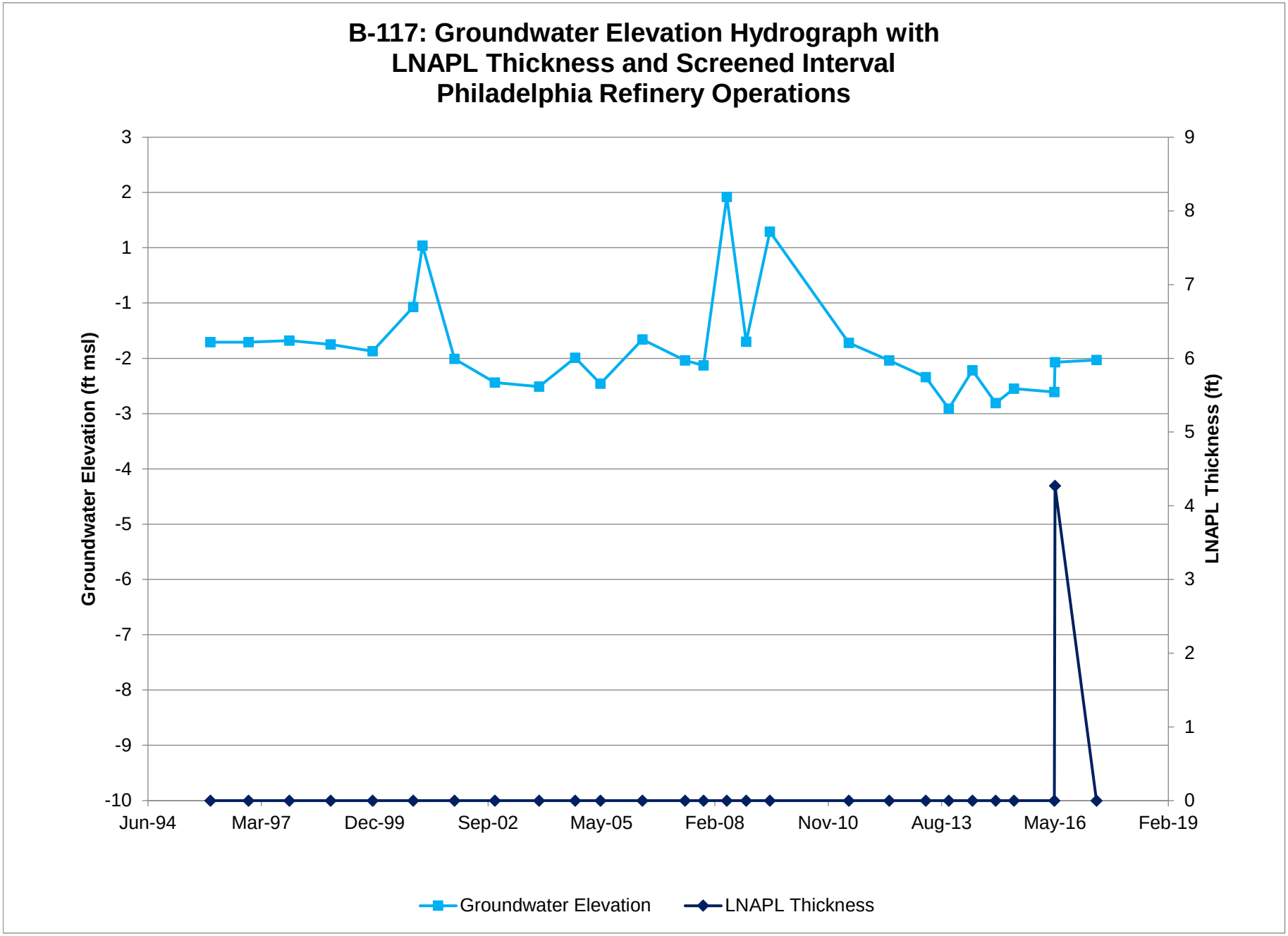
1. Wells Screened in the unconfined aquifer are included in the counts.
2. Measurable apparent LNAPL thickness and observed sheen are considered LNAPL indicators for these counts.

Appendix F.1
Well Gauging Data Plots

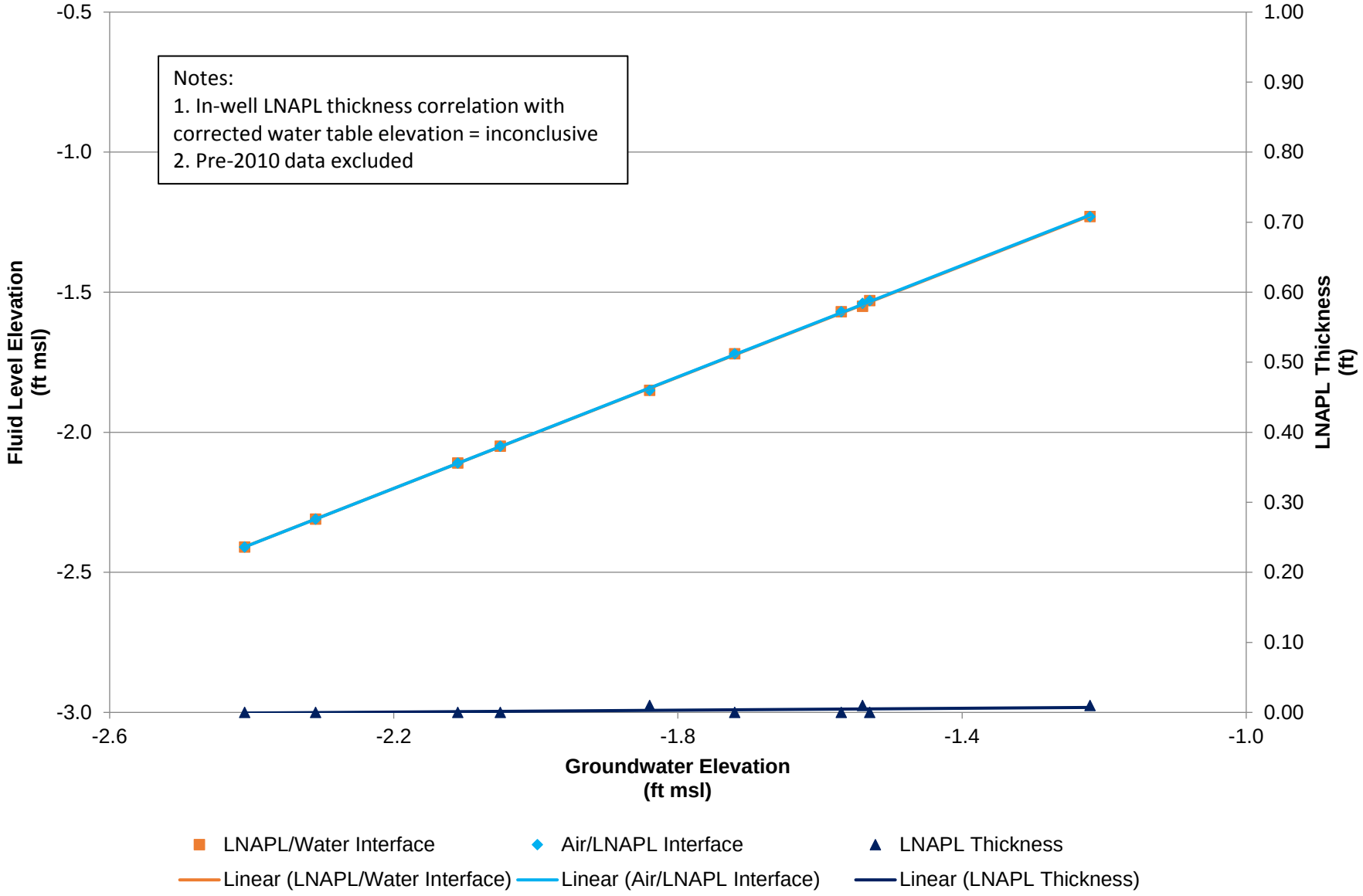

B-116: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Jun-94
Mar-97
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Groundwater Elevation
LNAPL Thickness

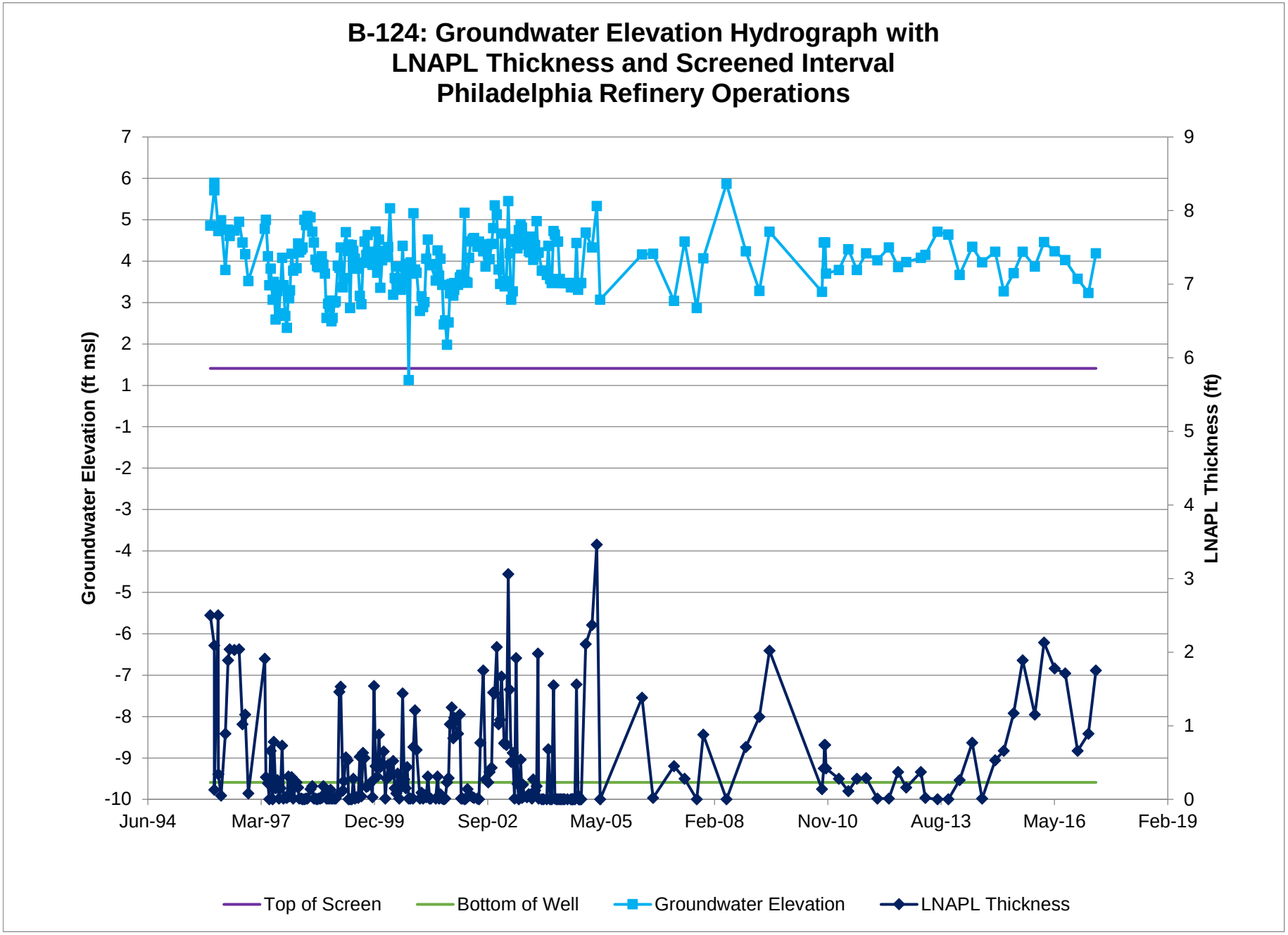
B-116: Diagnostic Gauge Plot
Philadelphia Refinery Operations



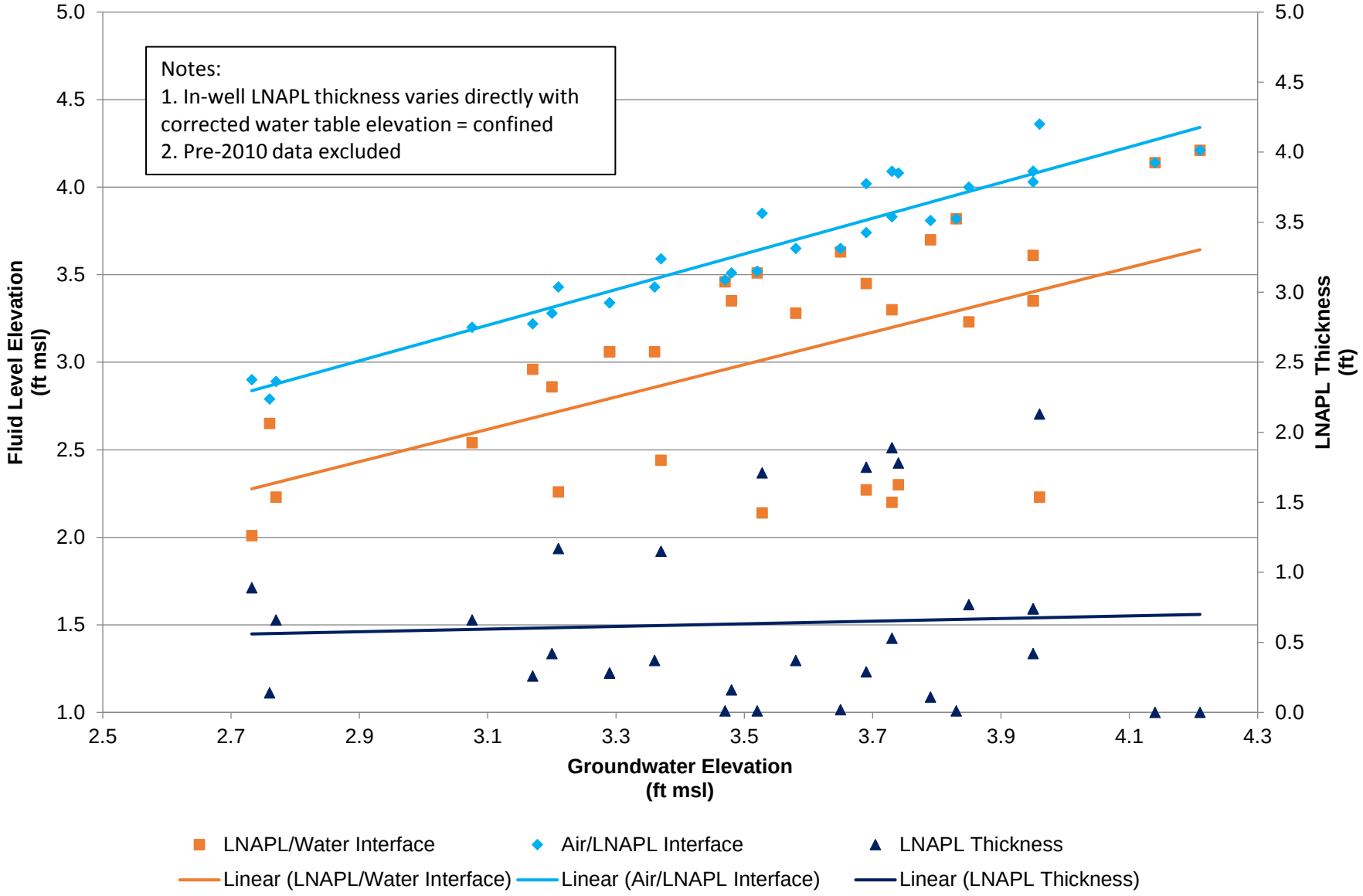

B-117: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Jun-94
Mar-97
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Groundwater Elevation
LNAPL Thickness

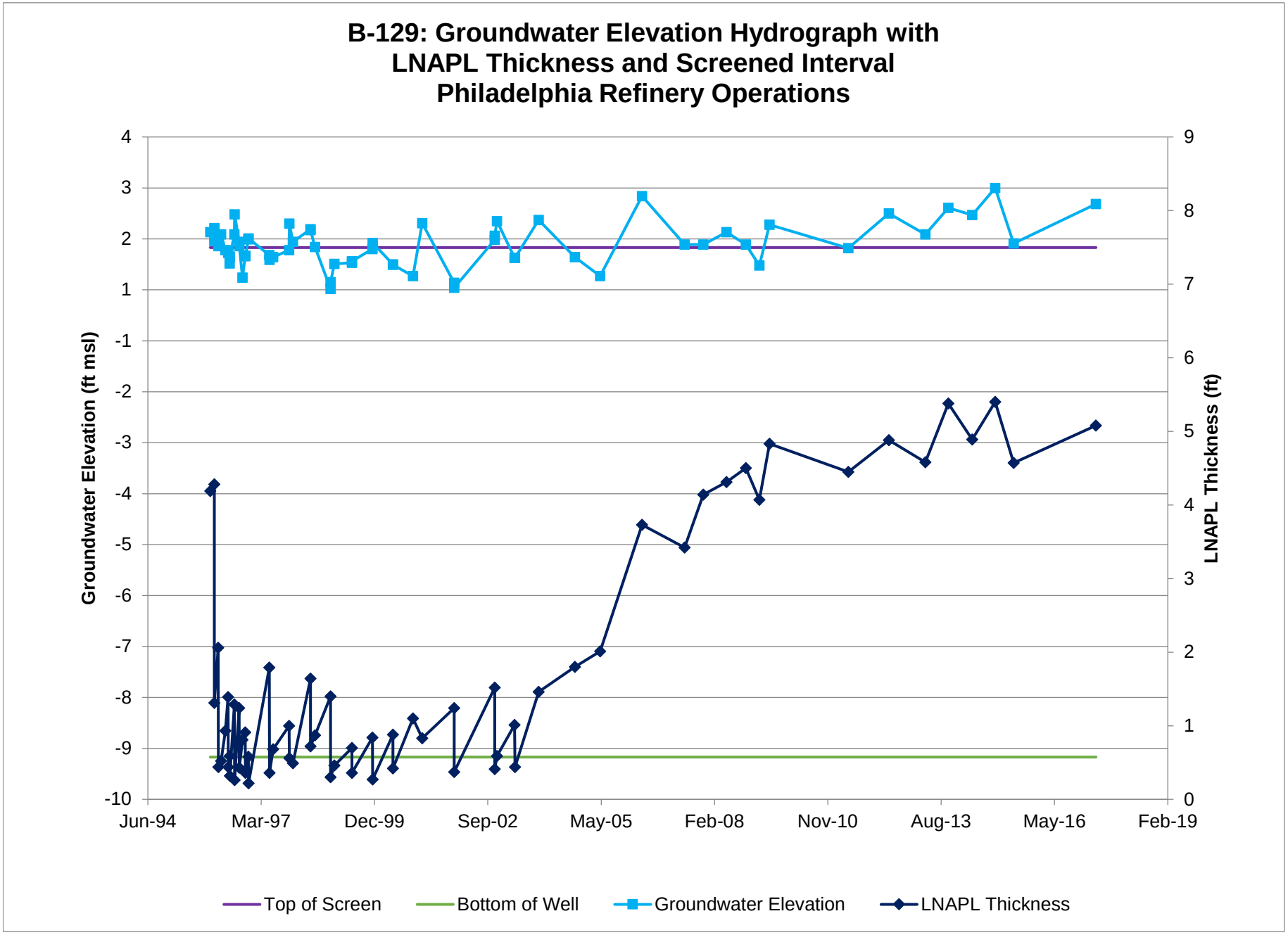
B-117: Diagnostic Gauge Plot
Philadelphia Refinery Operations



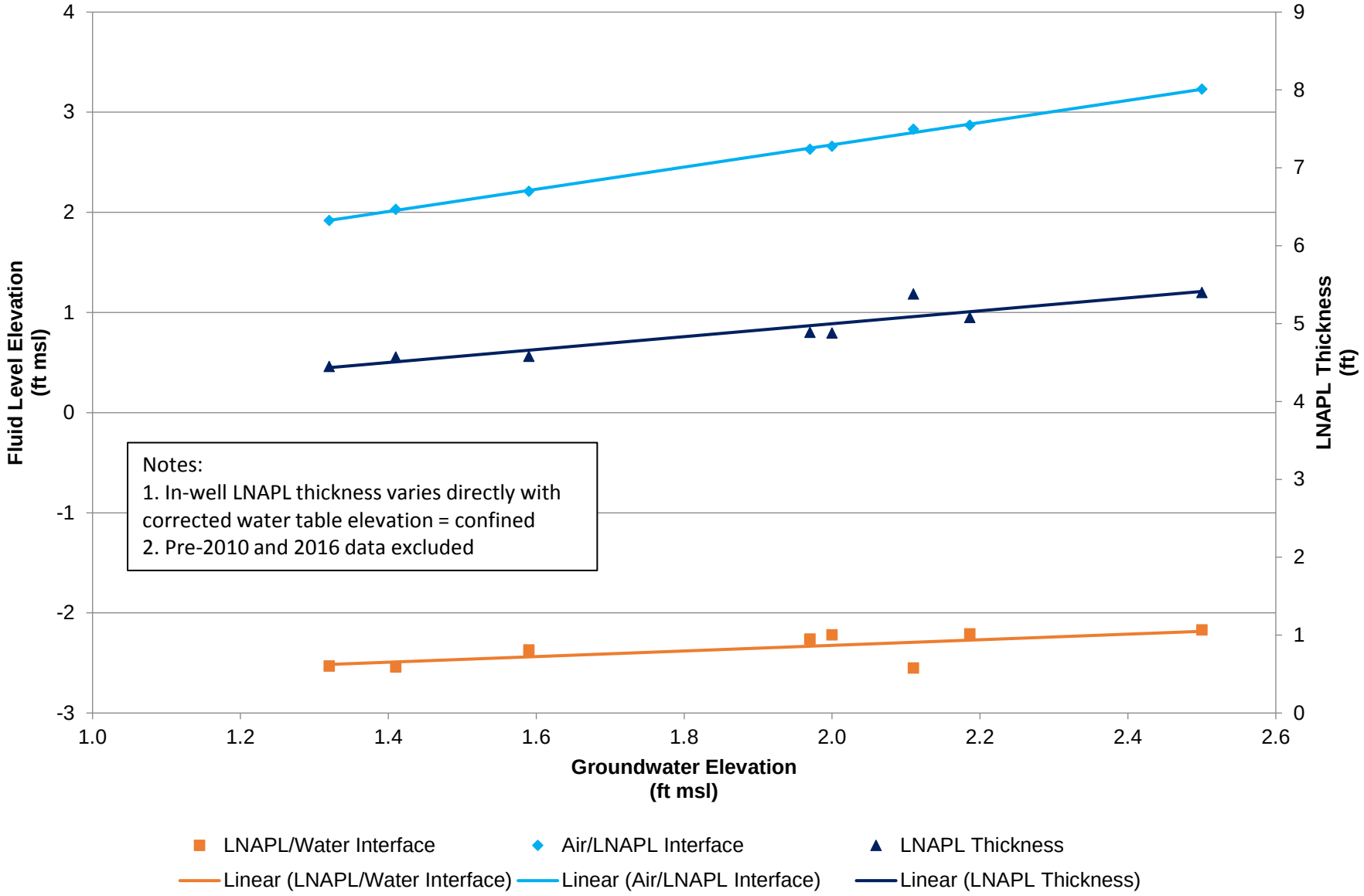

B-124: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Jun-94
Mar-97
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

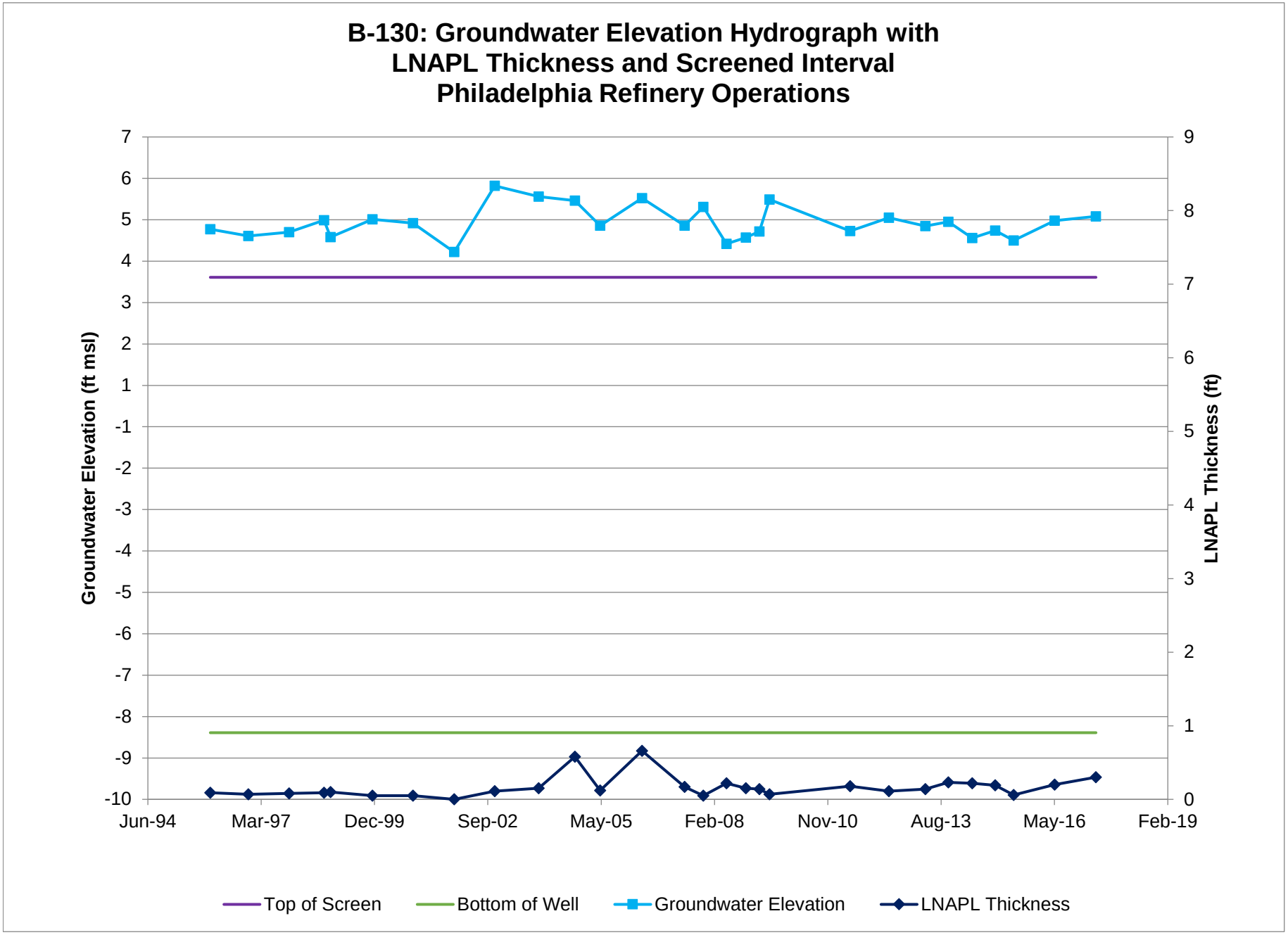
B-124: Diagnostic Gauge Plot
Philadelphia Refinery Operations



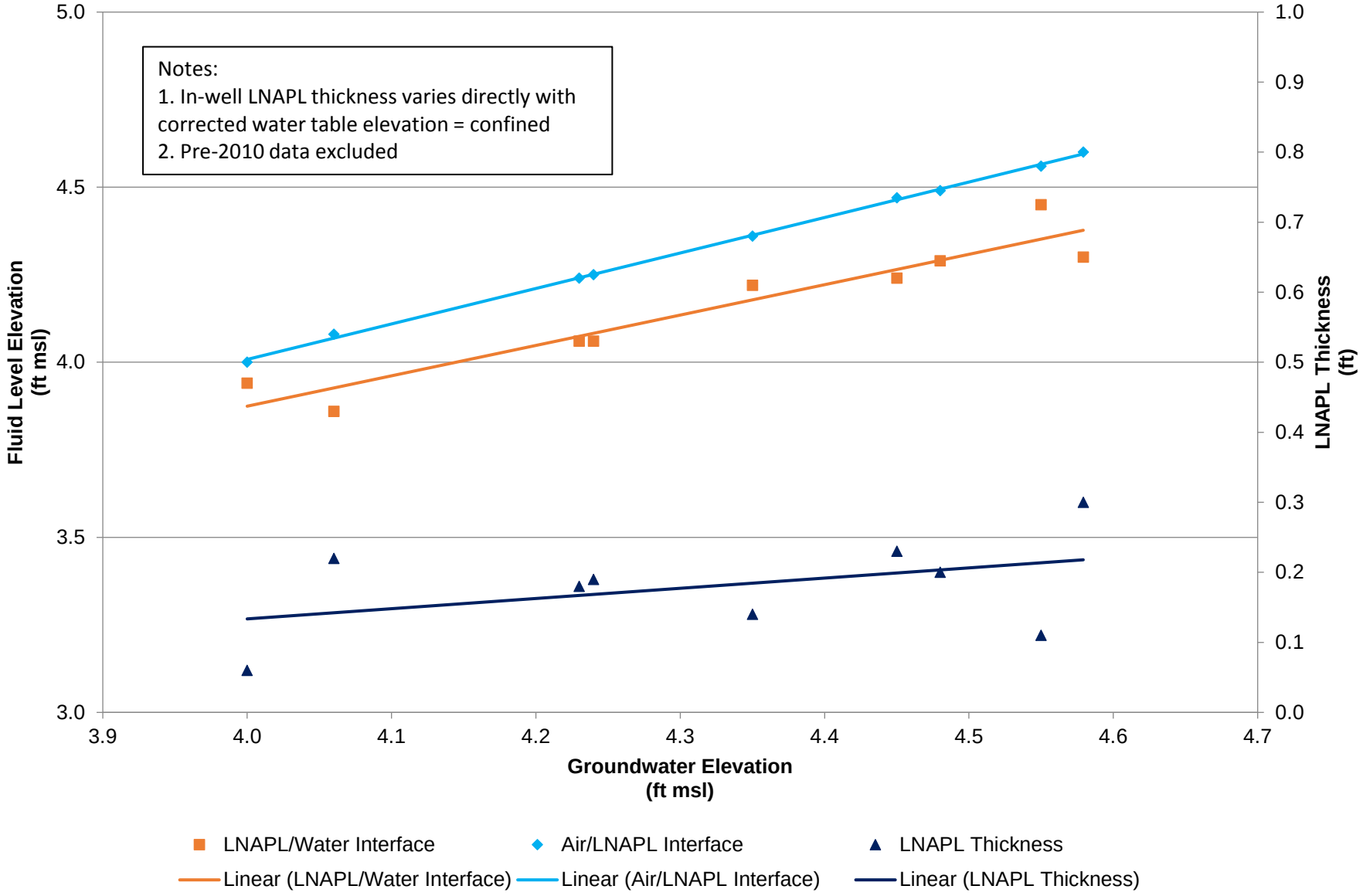

B-129: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Jun-94
Mar-97
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

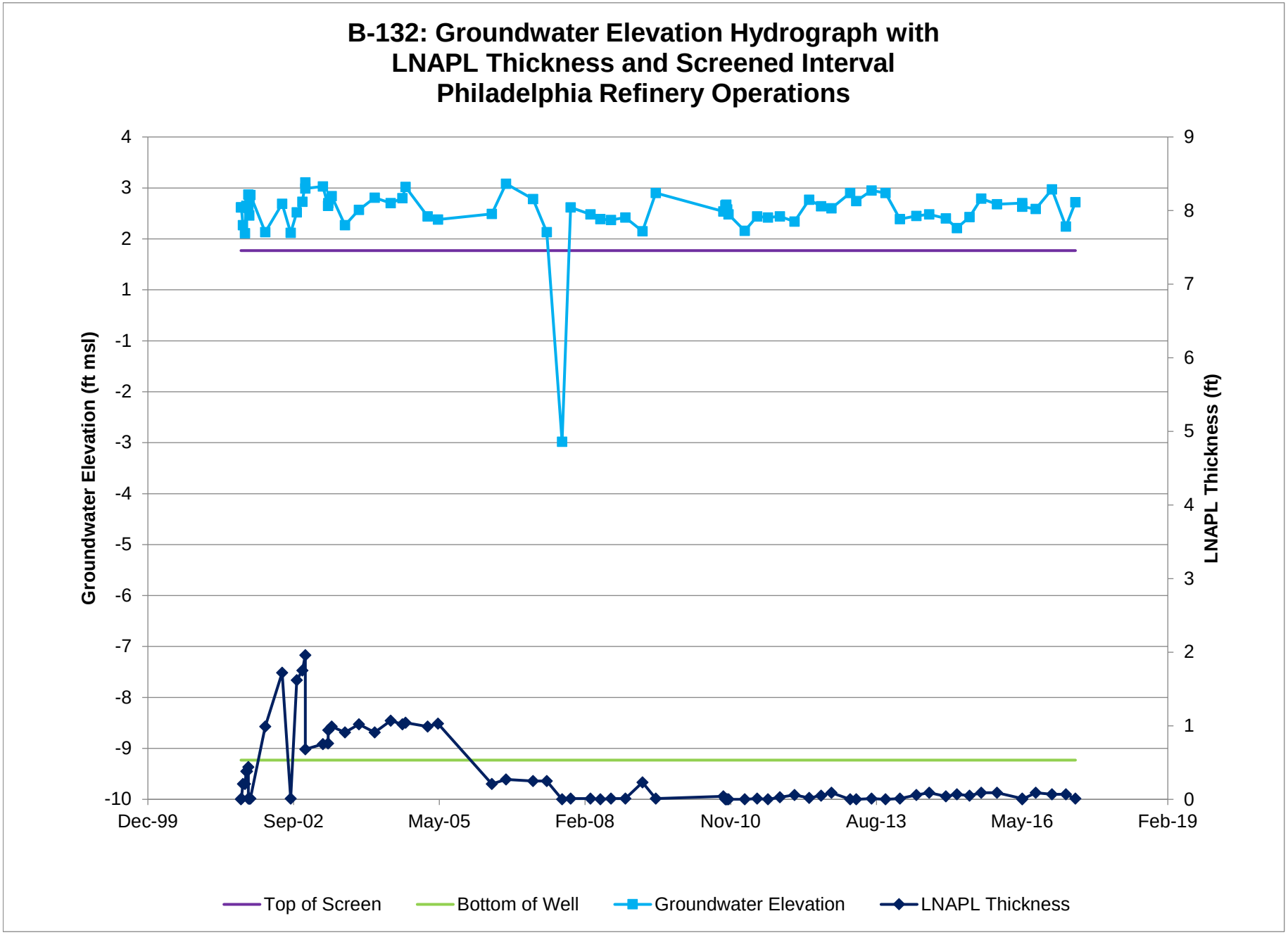
B-129: Diagnostic Gauge Plot
Philadelphia Refinery Operations



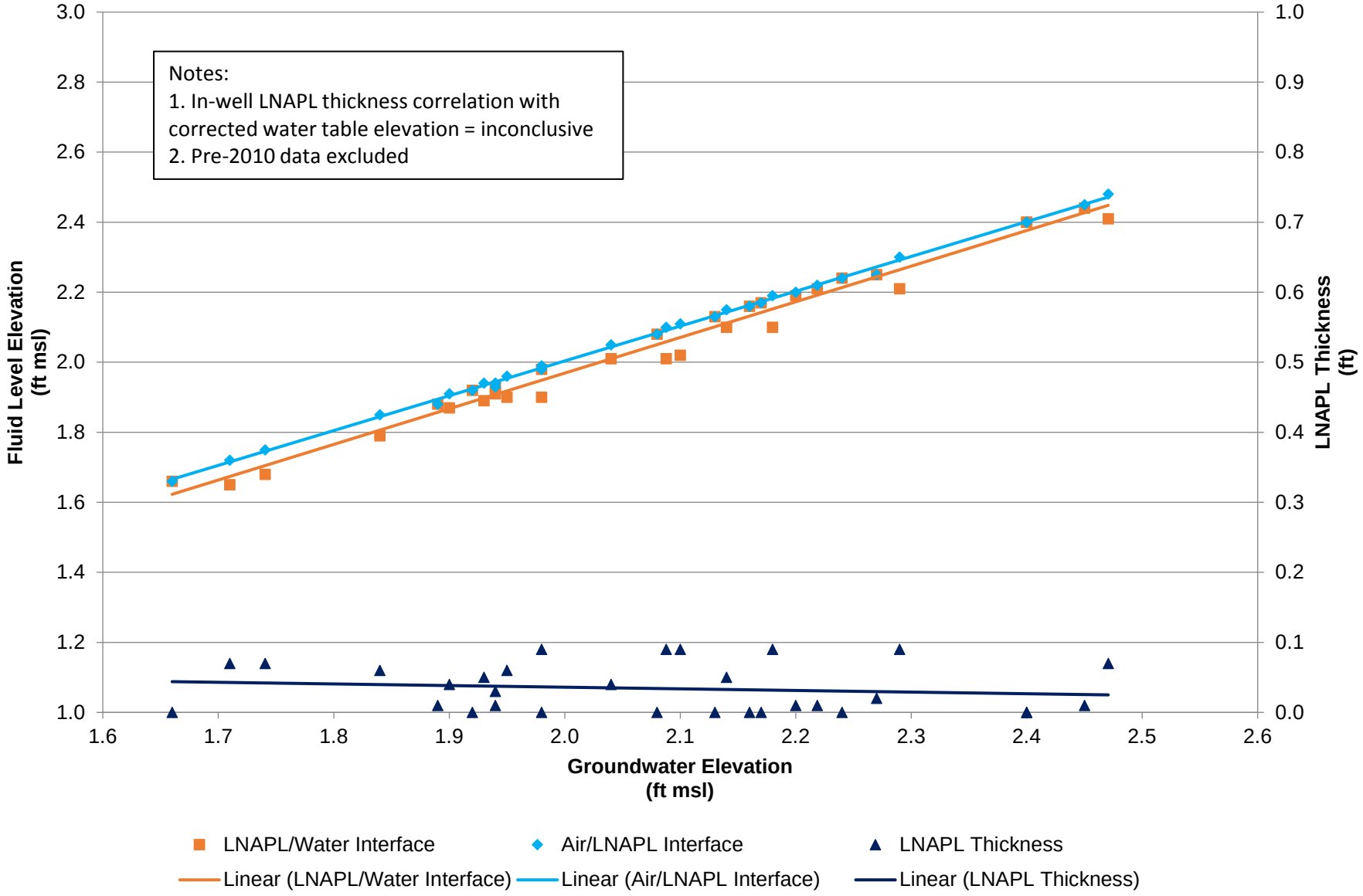

B-130: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Jun-94
Mar-97
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

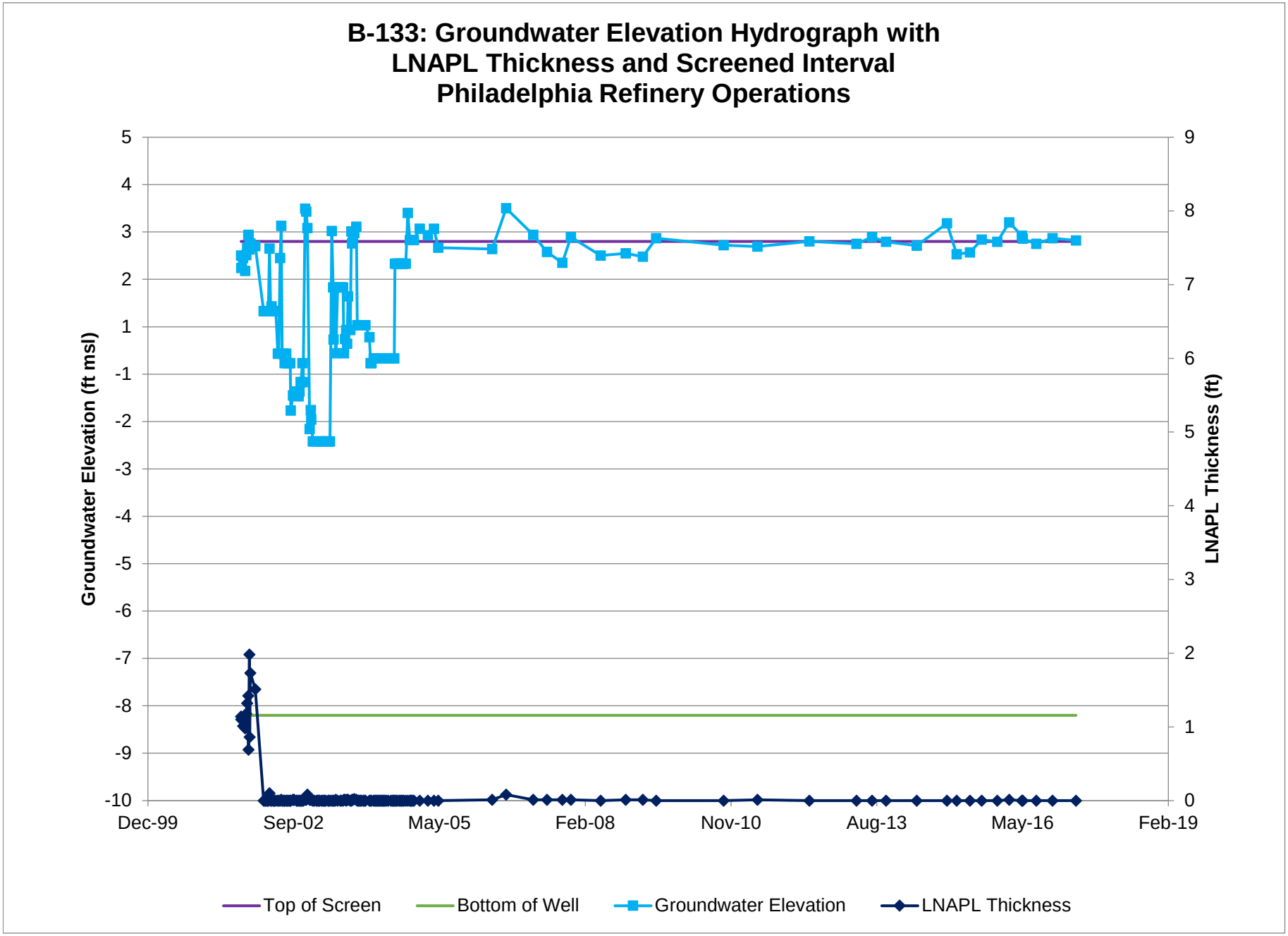
B-130: Diagnostic Gauge Plot
Philadelphia Refinery Operations



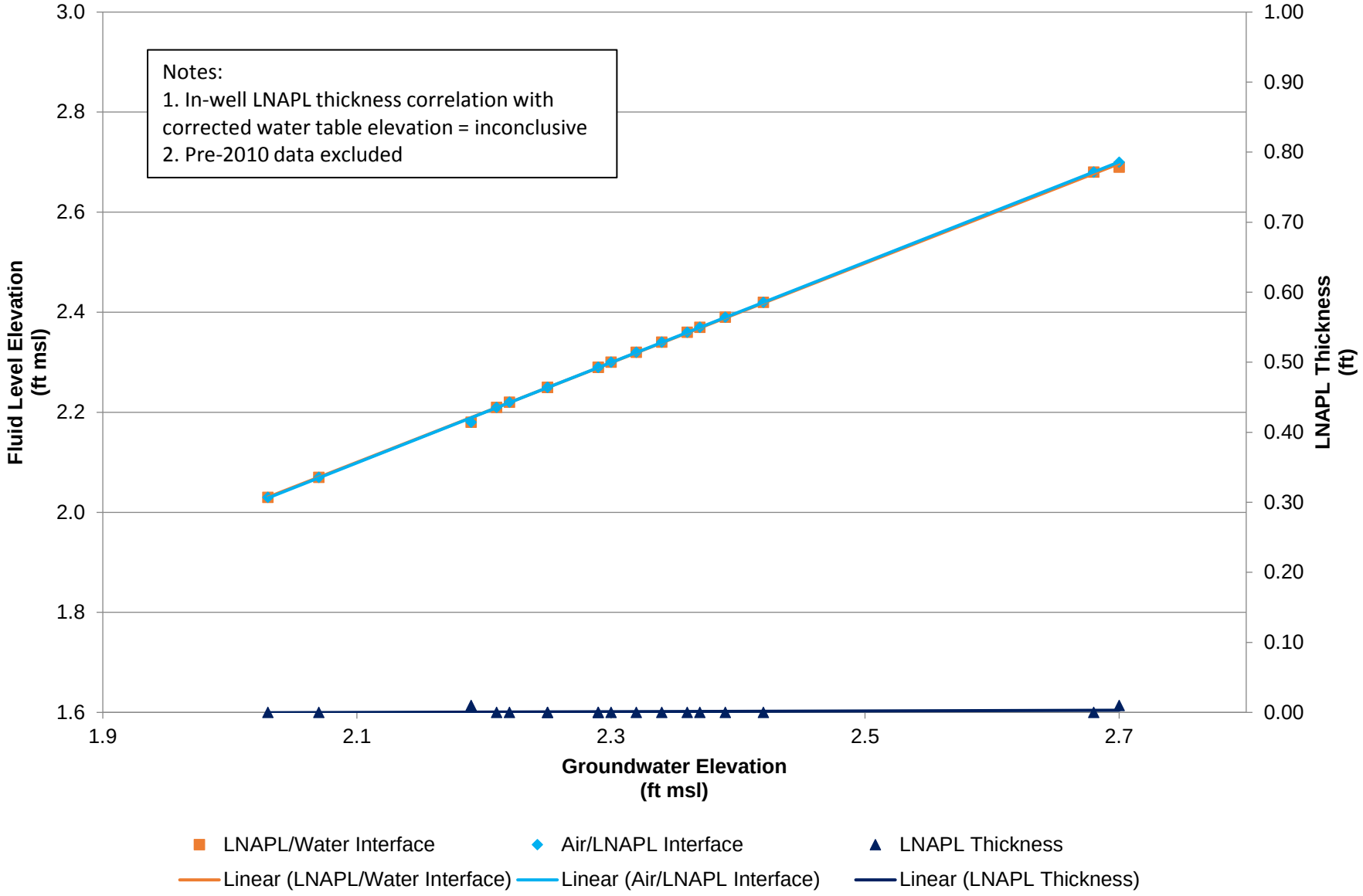

B-132: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

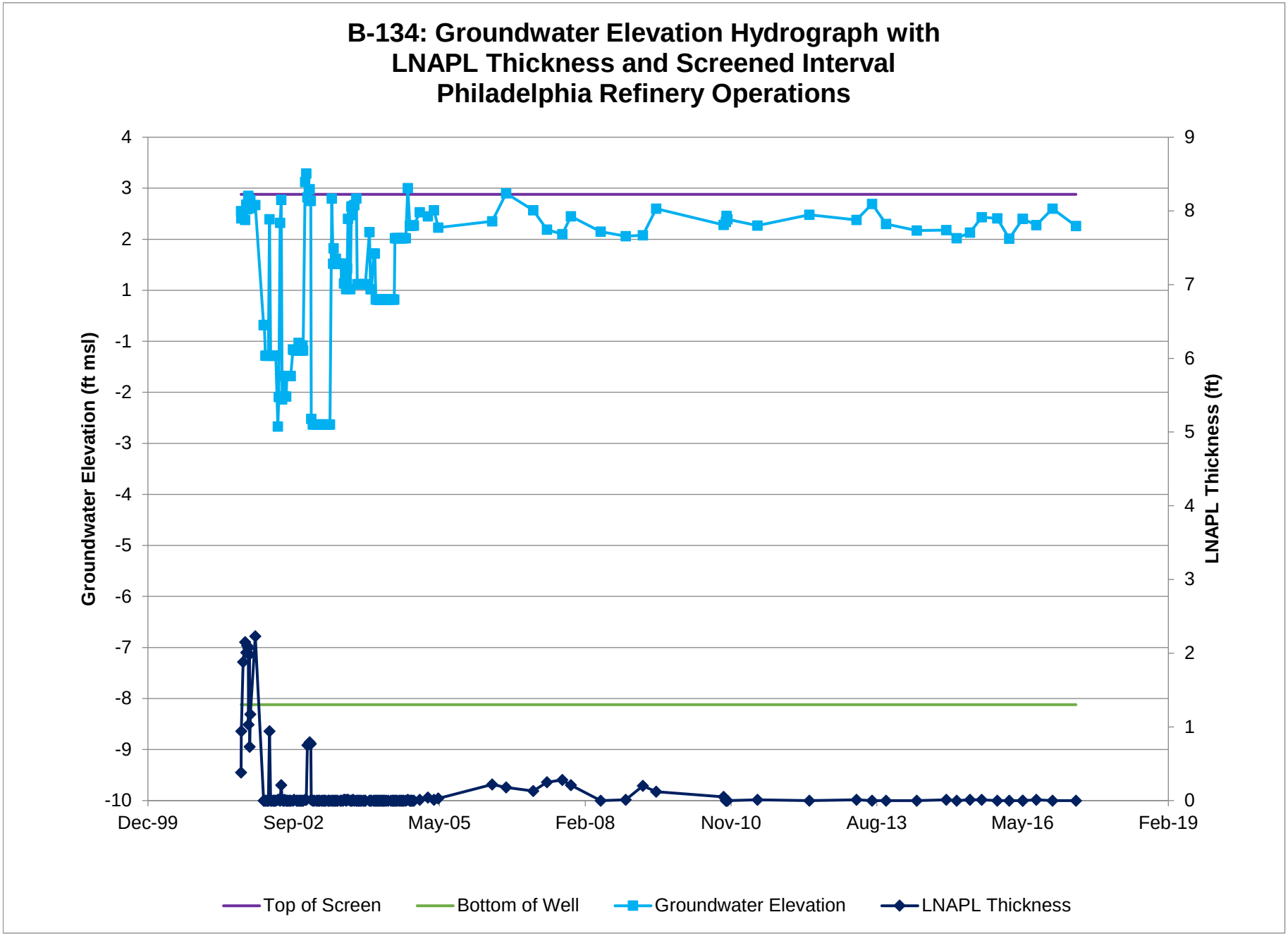
B-132: Diagnostic Gauge Plot
Philadelphia Refinery Operations



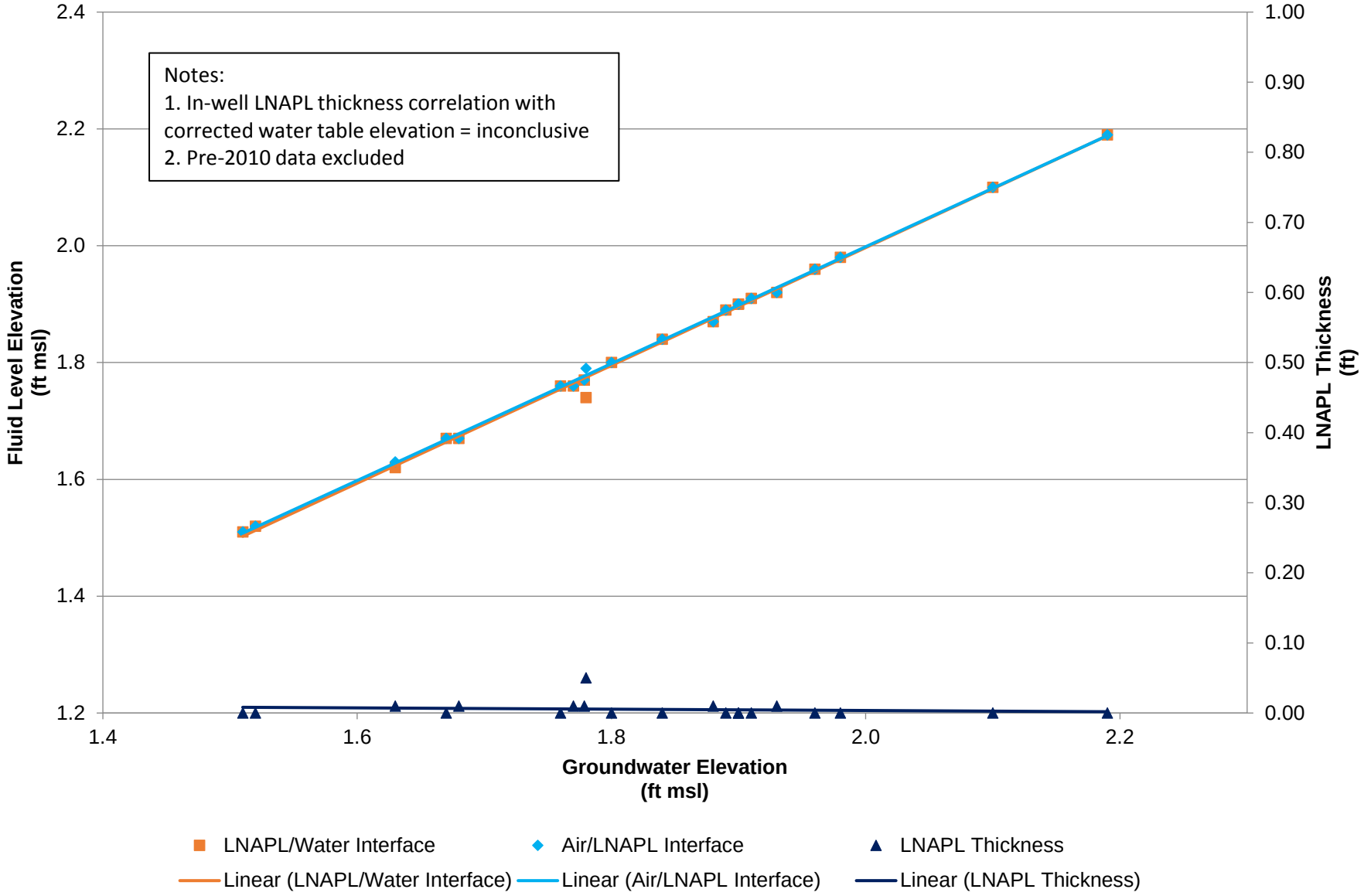

B-133: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

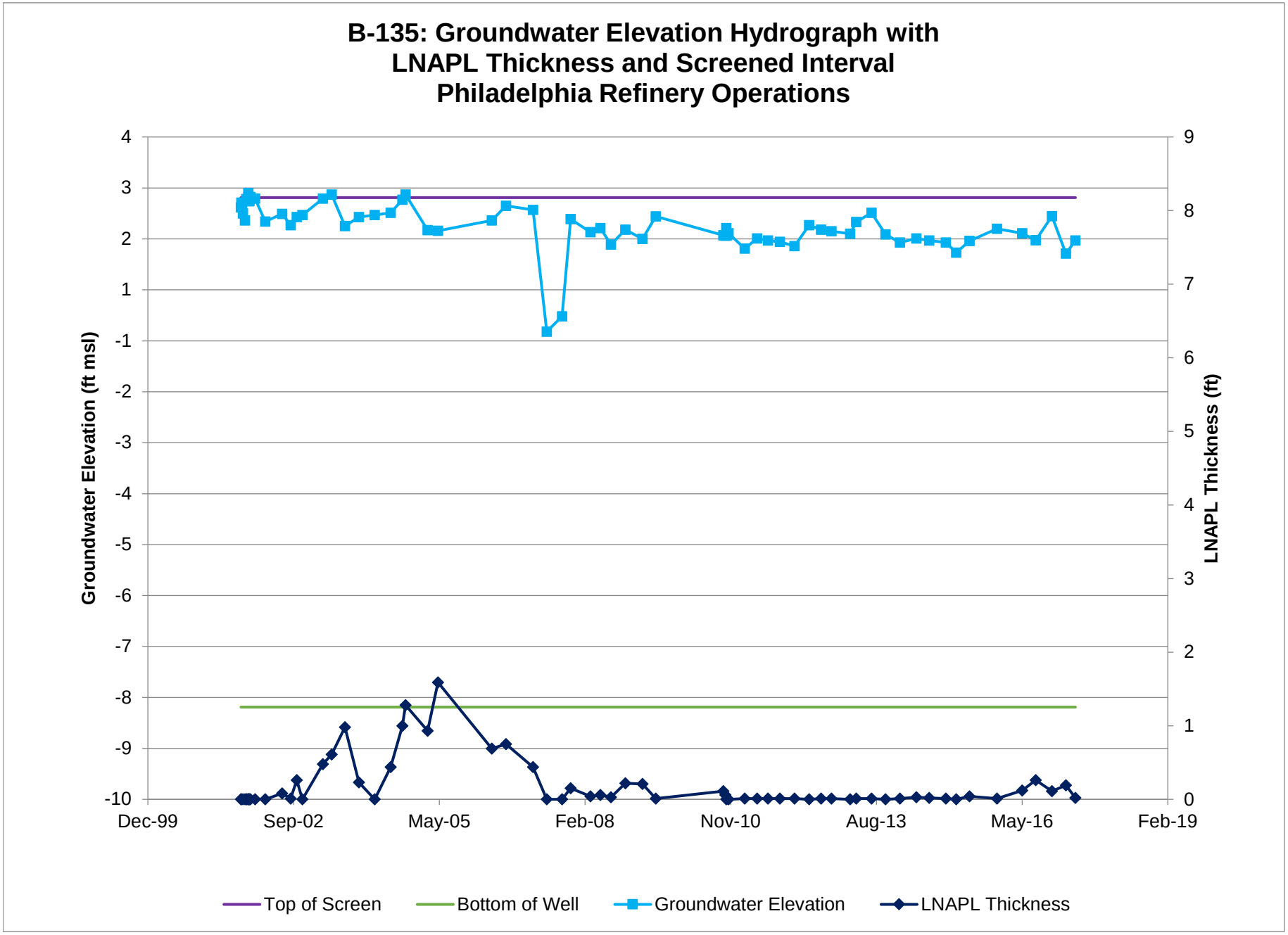
B-133: Diagnostic Gauge Plot
Philadelphia Refinery Operations



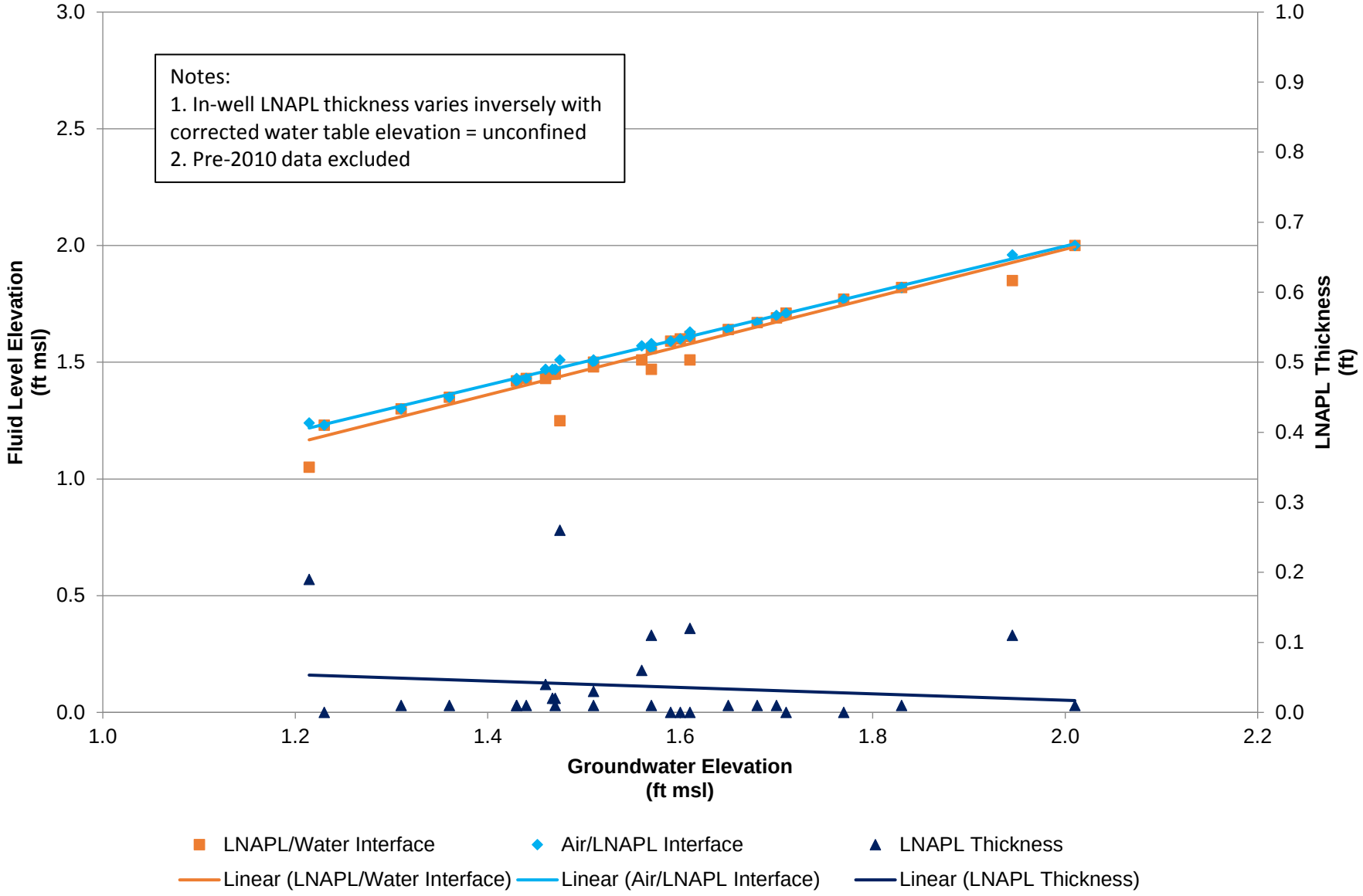

B-134: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

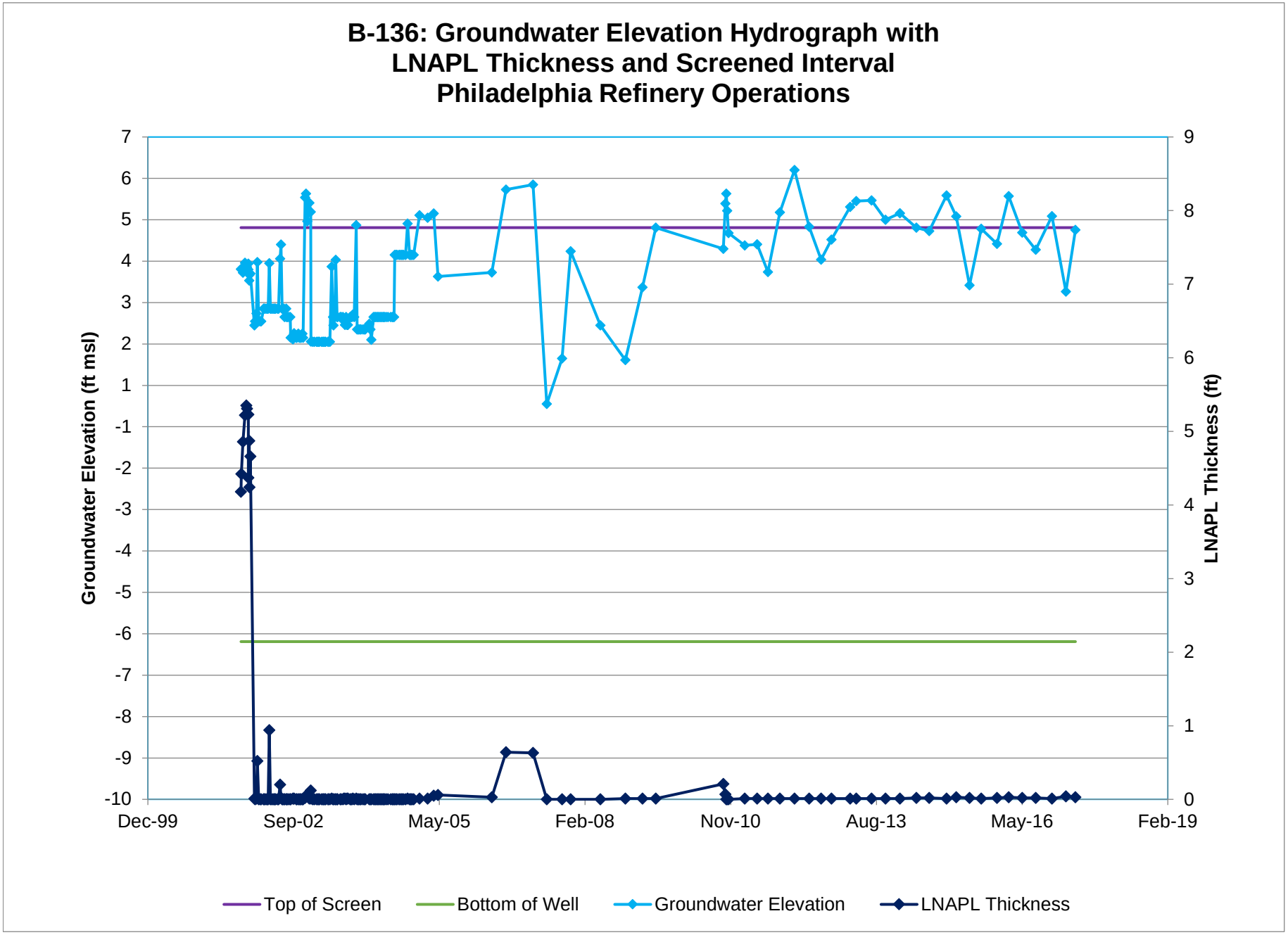
B-134: Diagnostic Gauge Plot
Philadelphia Refinery Operations



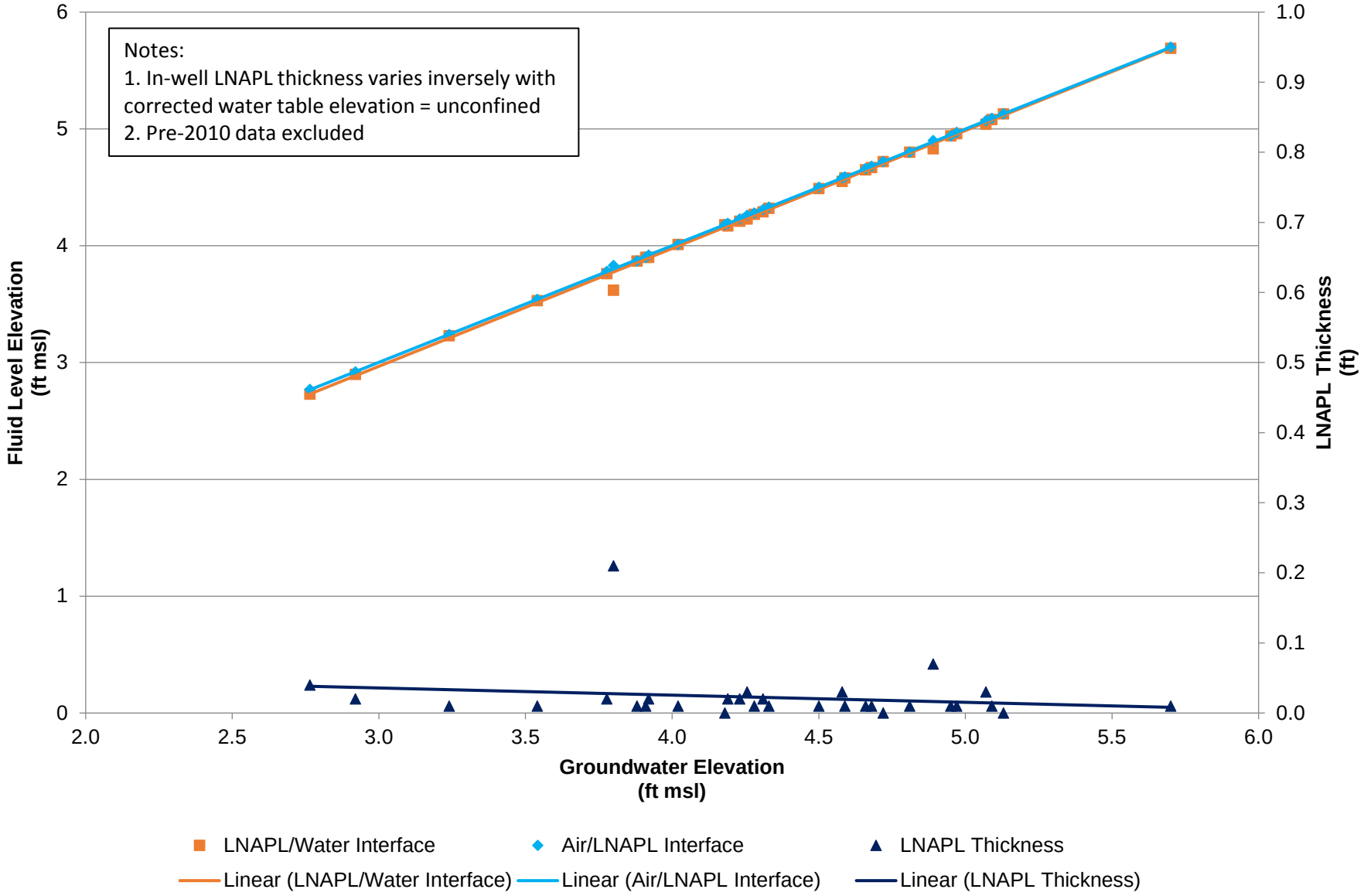

B-135: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

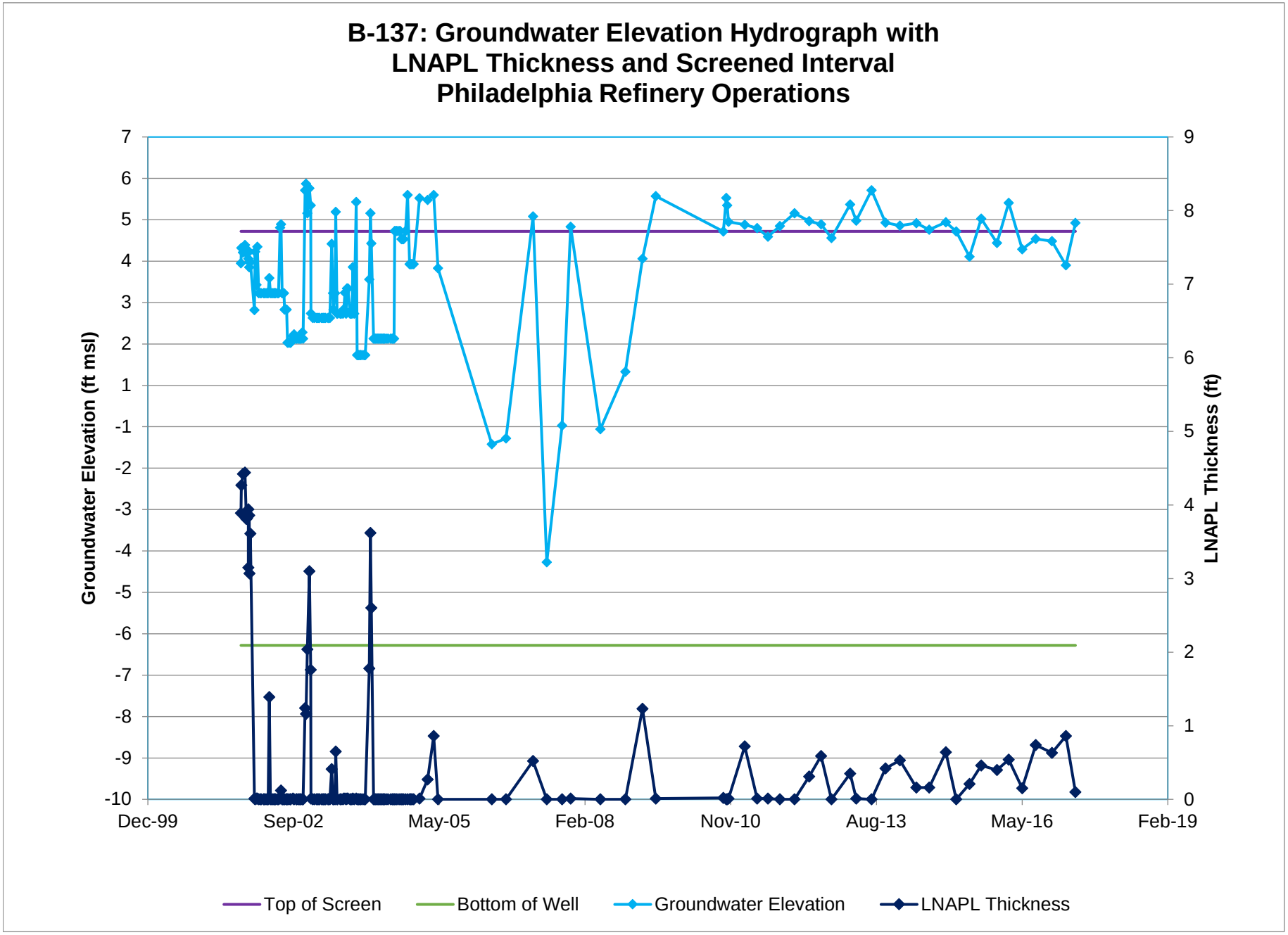
B-135: Diagnostic Gauge Plot
Philadelphia Refinery Operations



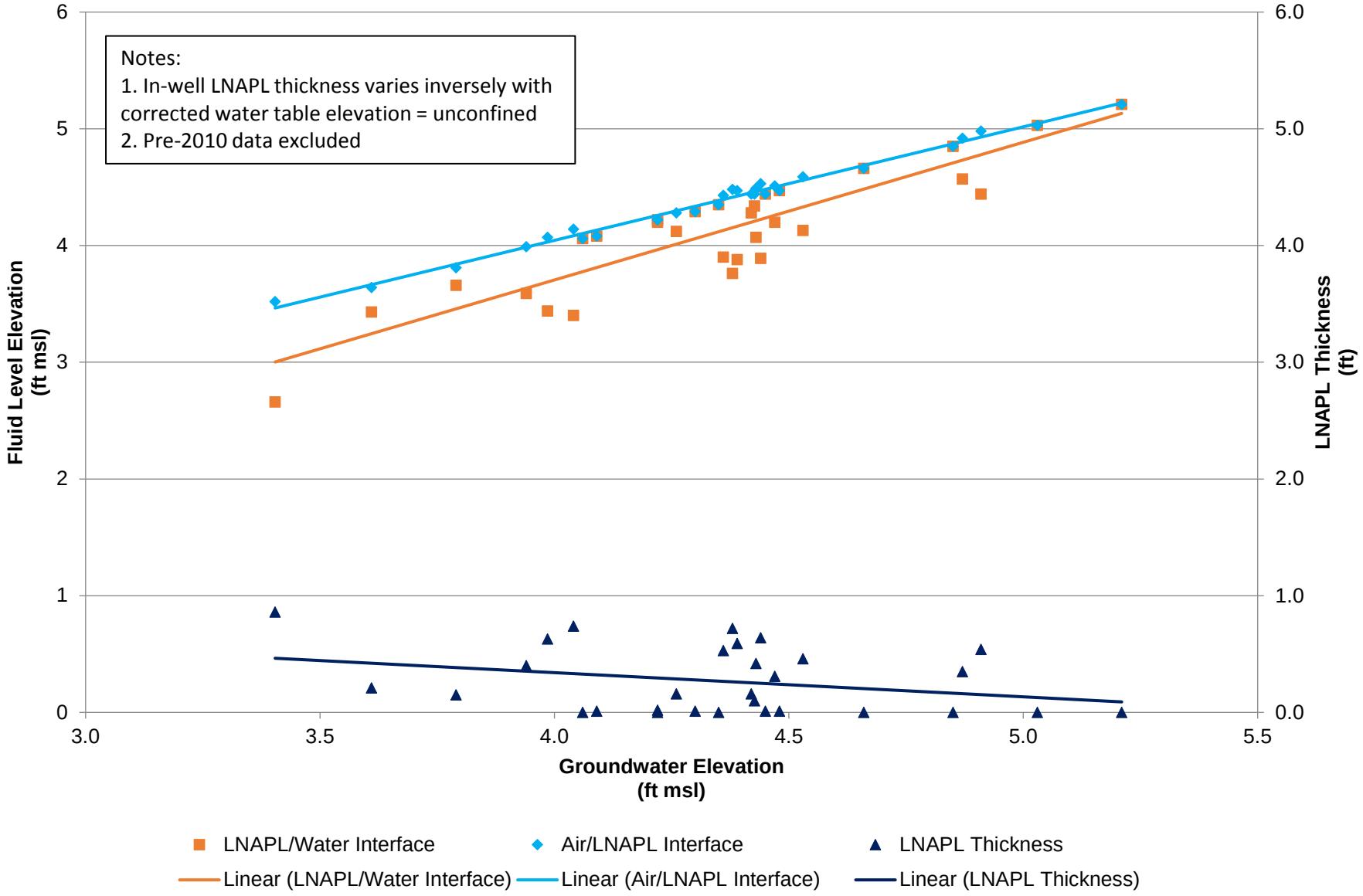

B-136: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

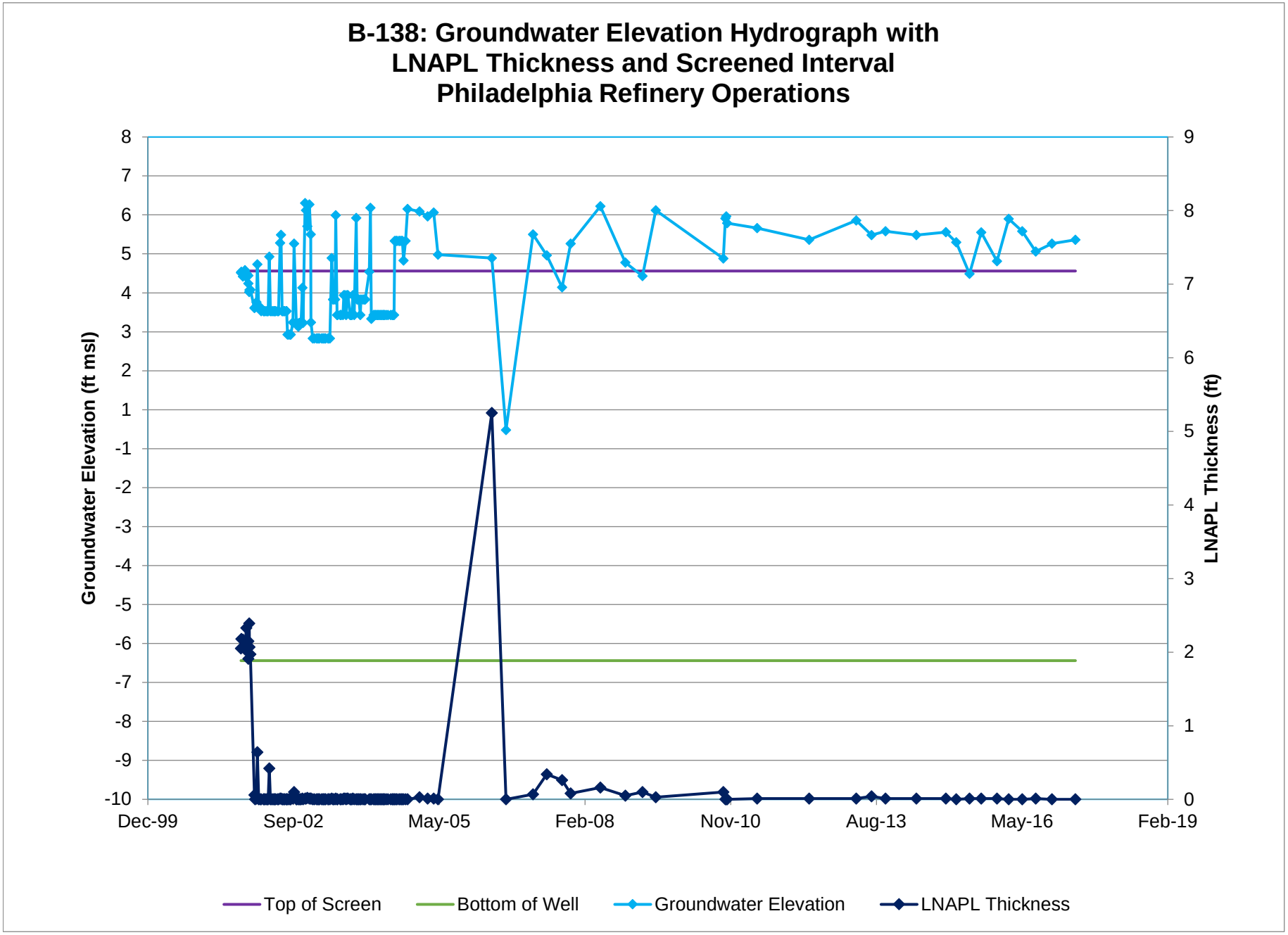
B-136: Diagnostic Gauge Plot
Philadelphia Refinery Operations



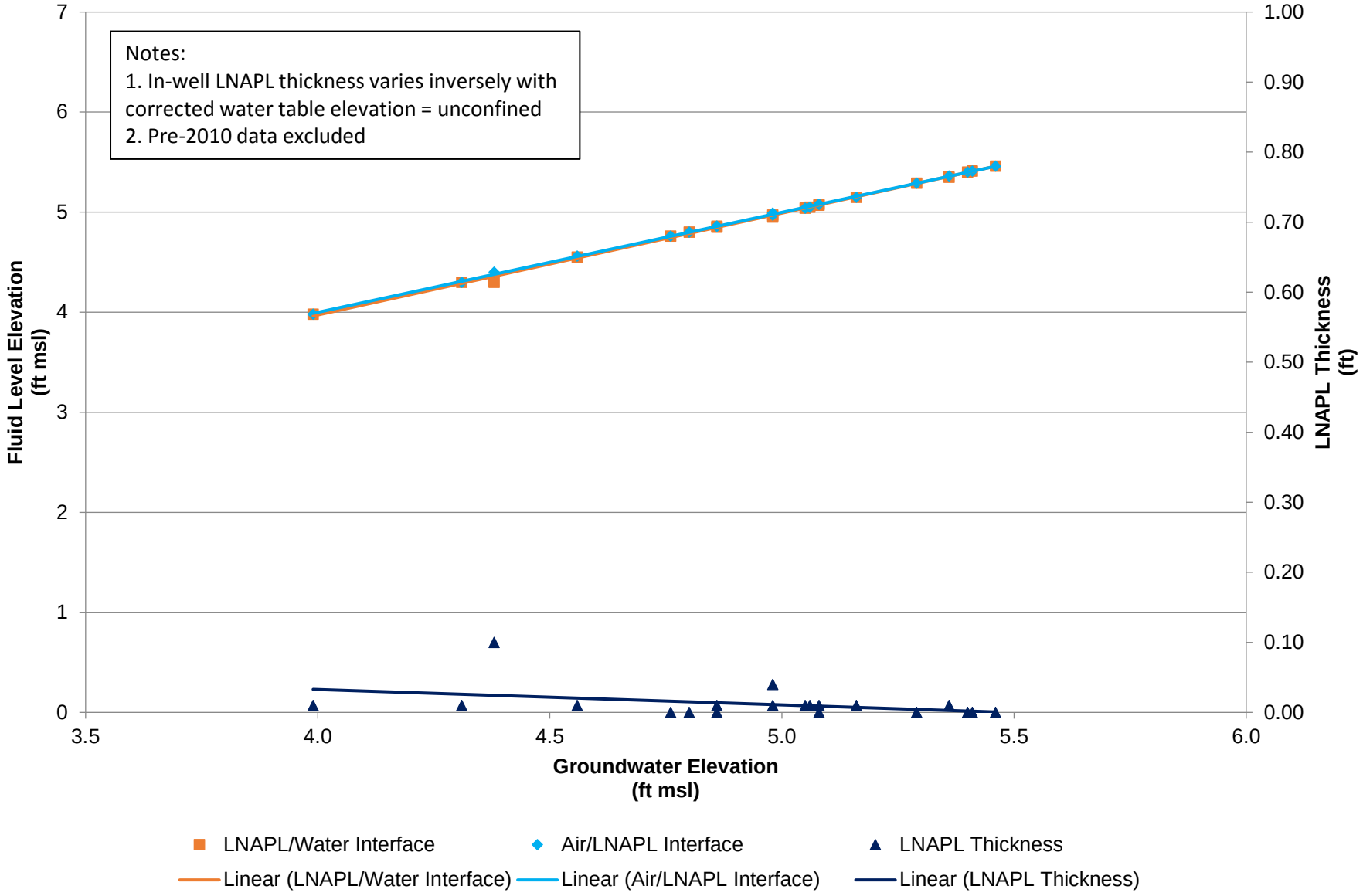

B-137: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

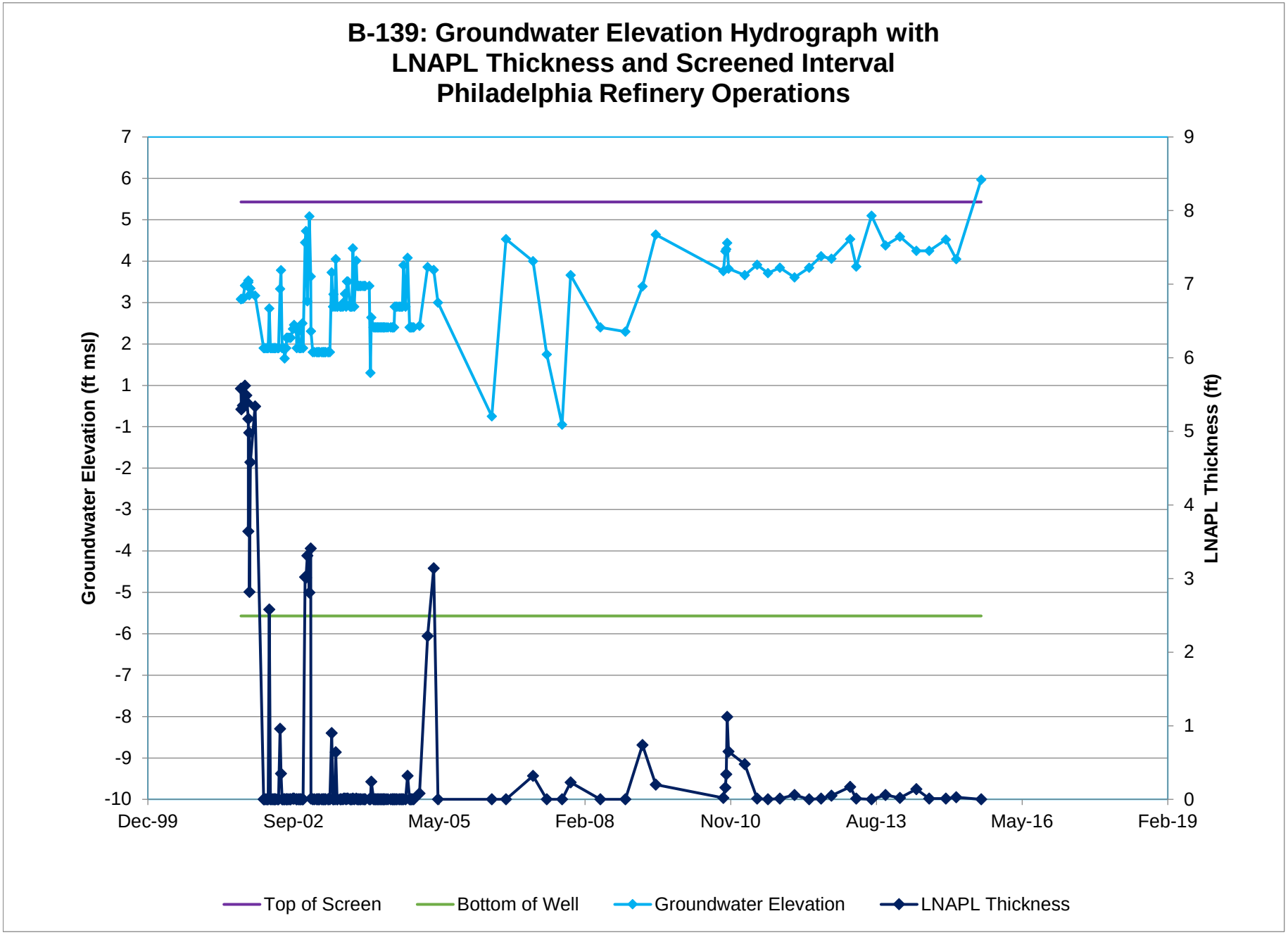
B-137: Diagnostic Gauge Plot
Philadelphia Refinery Operations



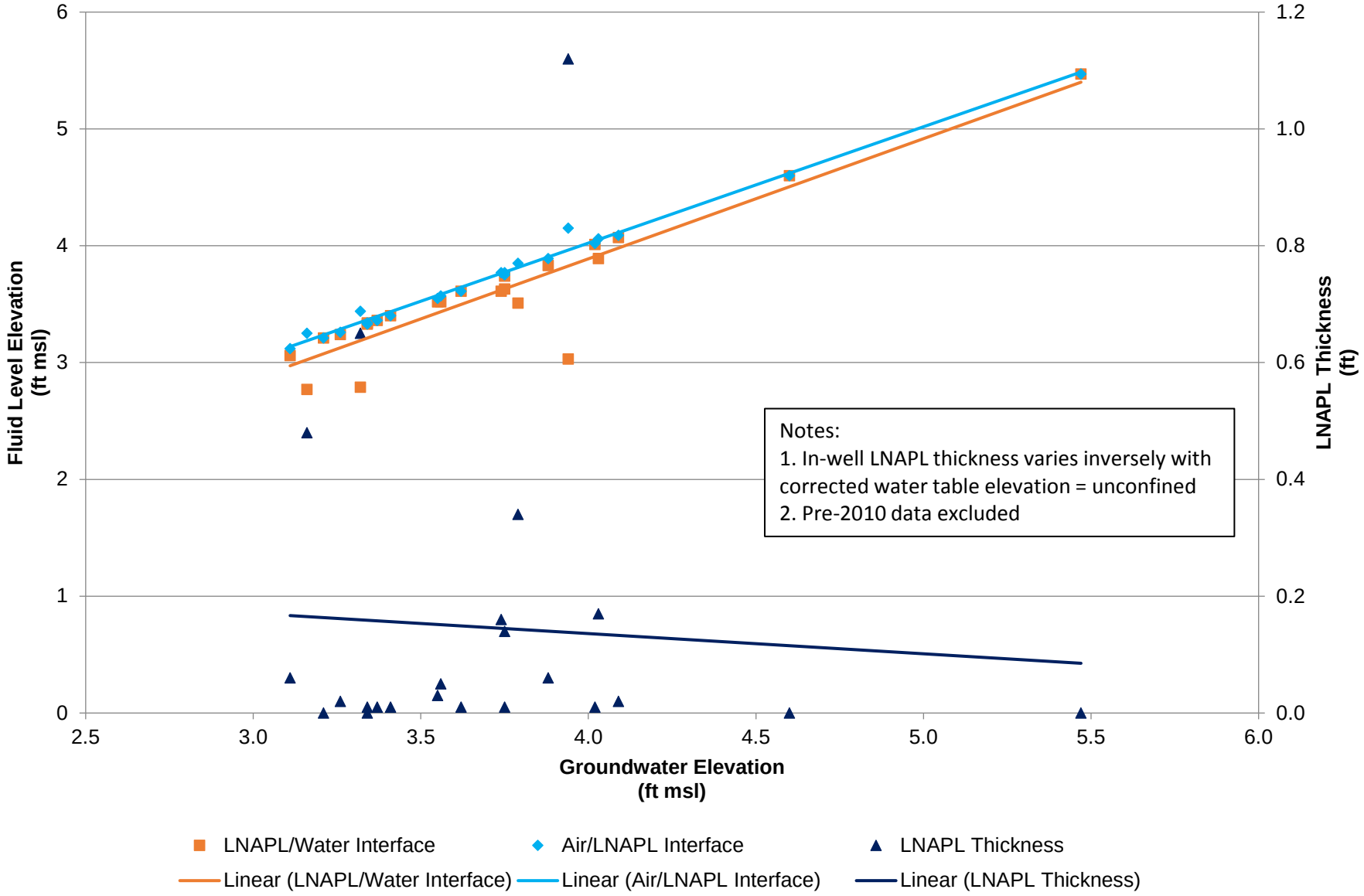

B-138: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

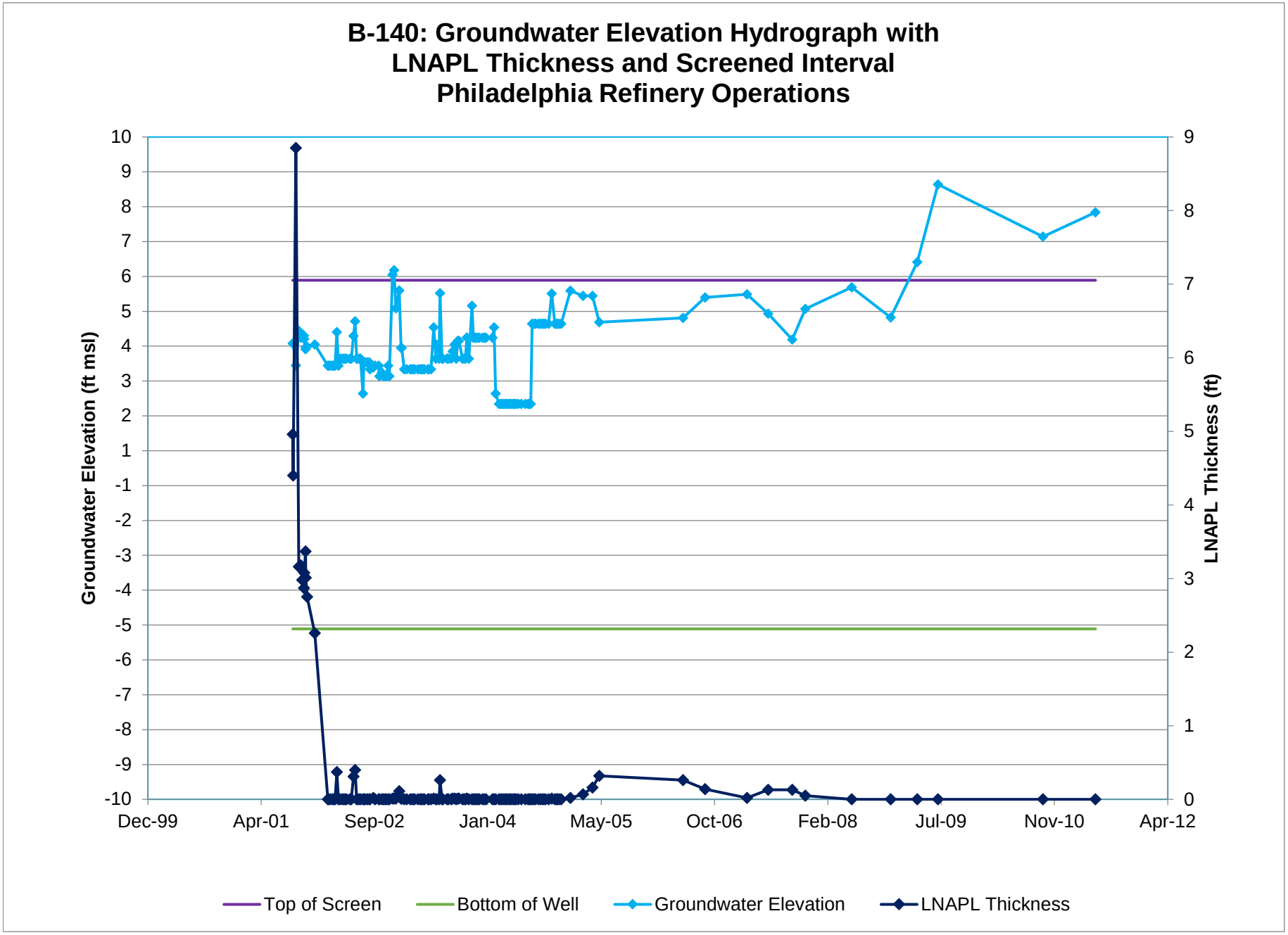
B-138: Diagnostic Gauge Plot
Philadelphia Refinery Operations

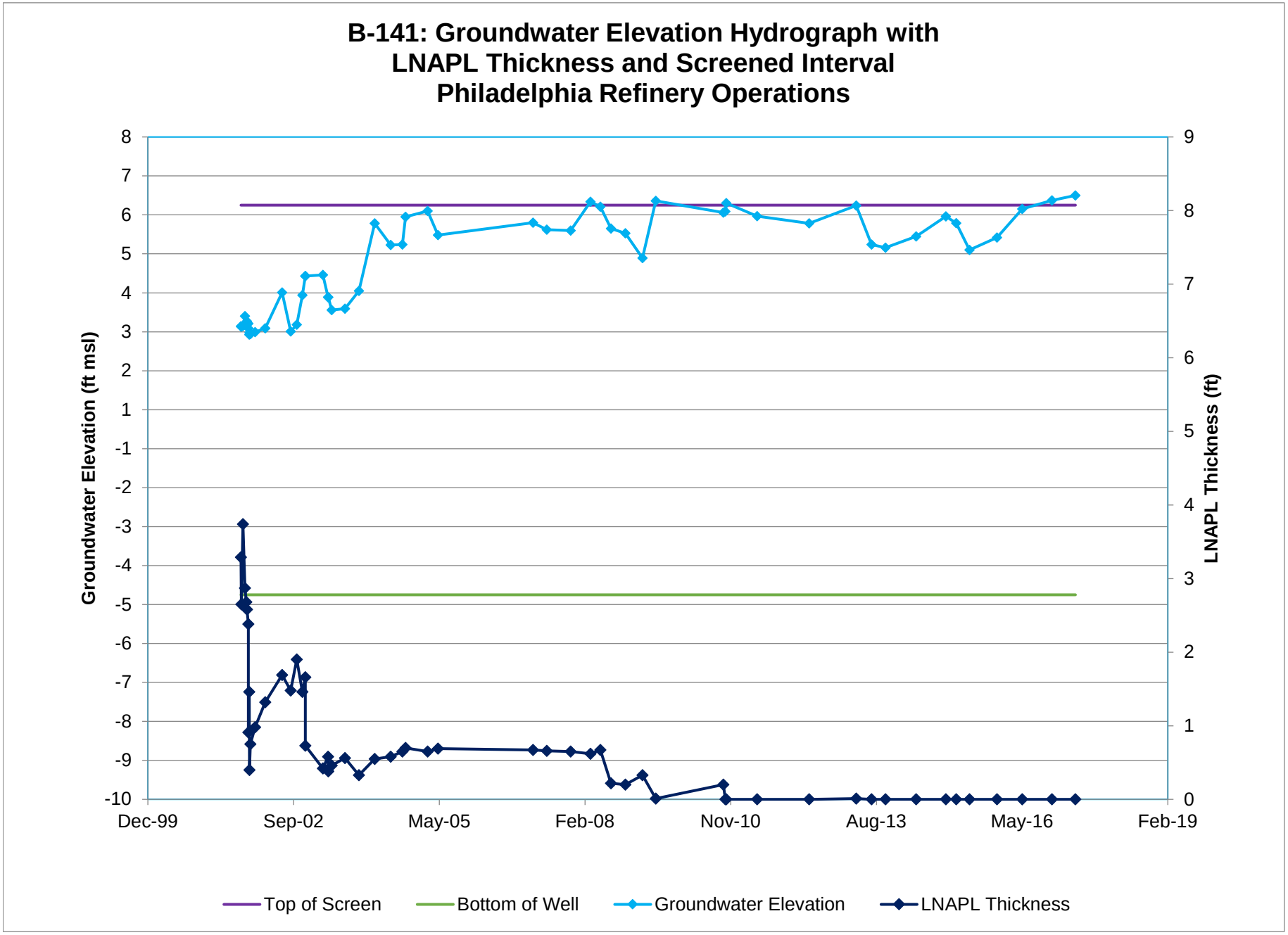



B-139: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

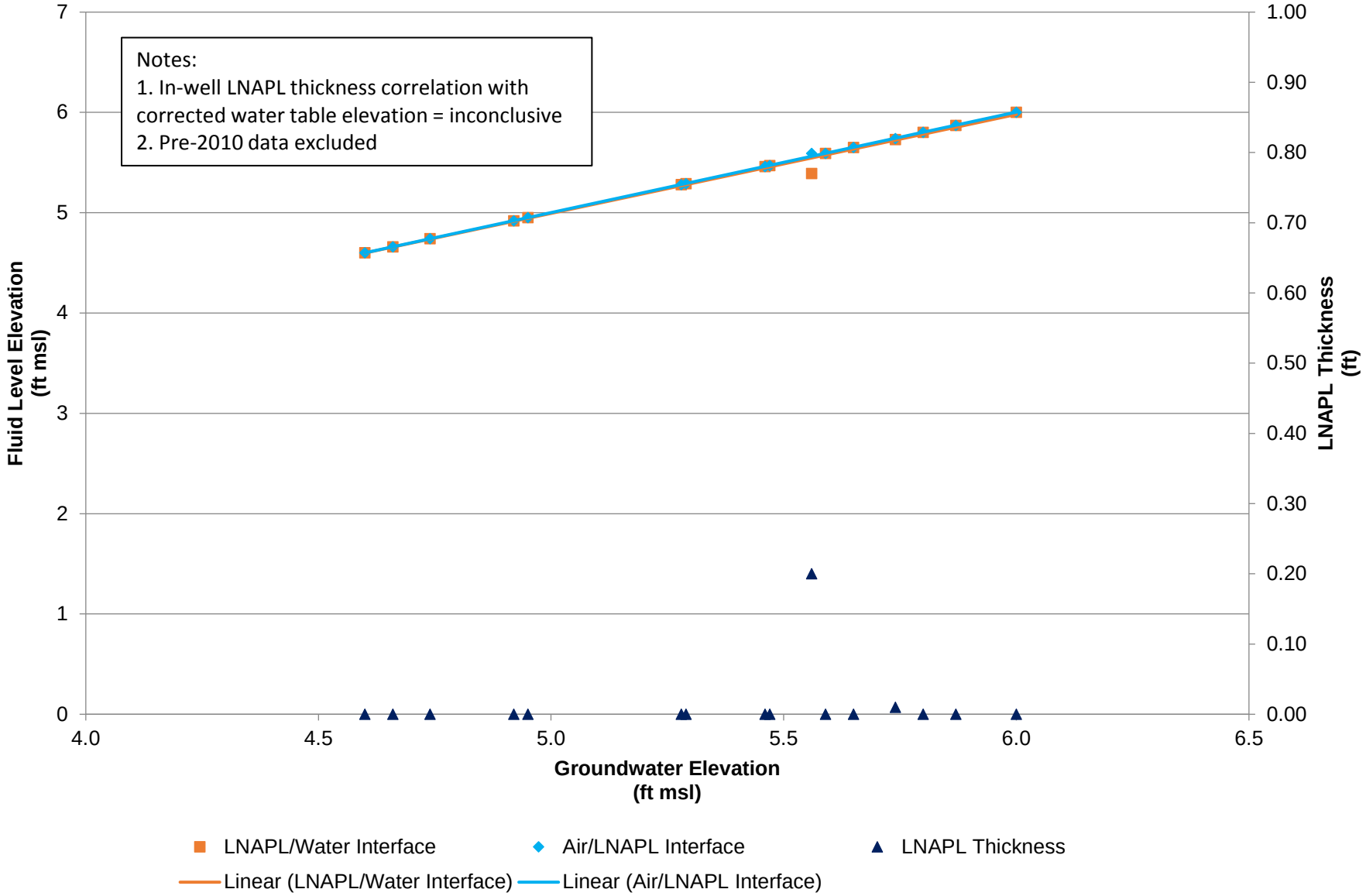
B-139: Diagnostic Gauge Plot
Philadelphia Refinery Operations

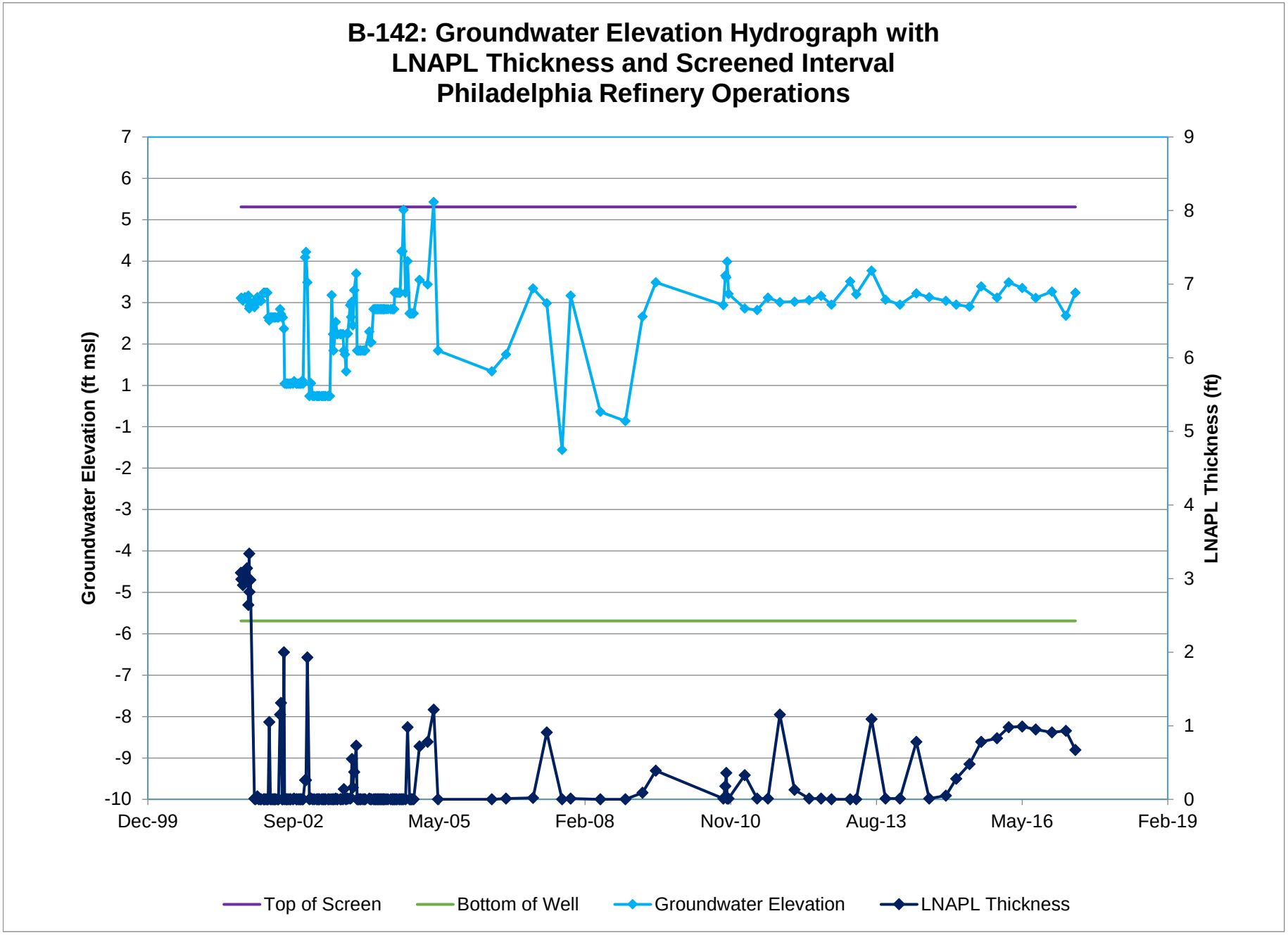



B-140: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
10
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
Jul-09
Nov-10
Apr-12
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

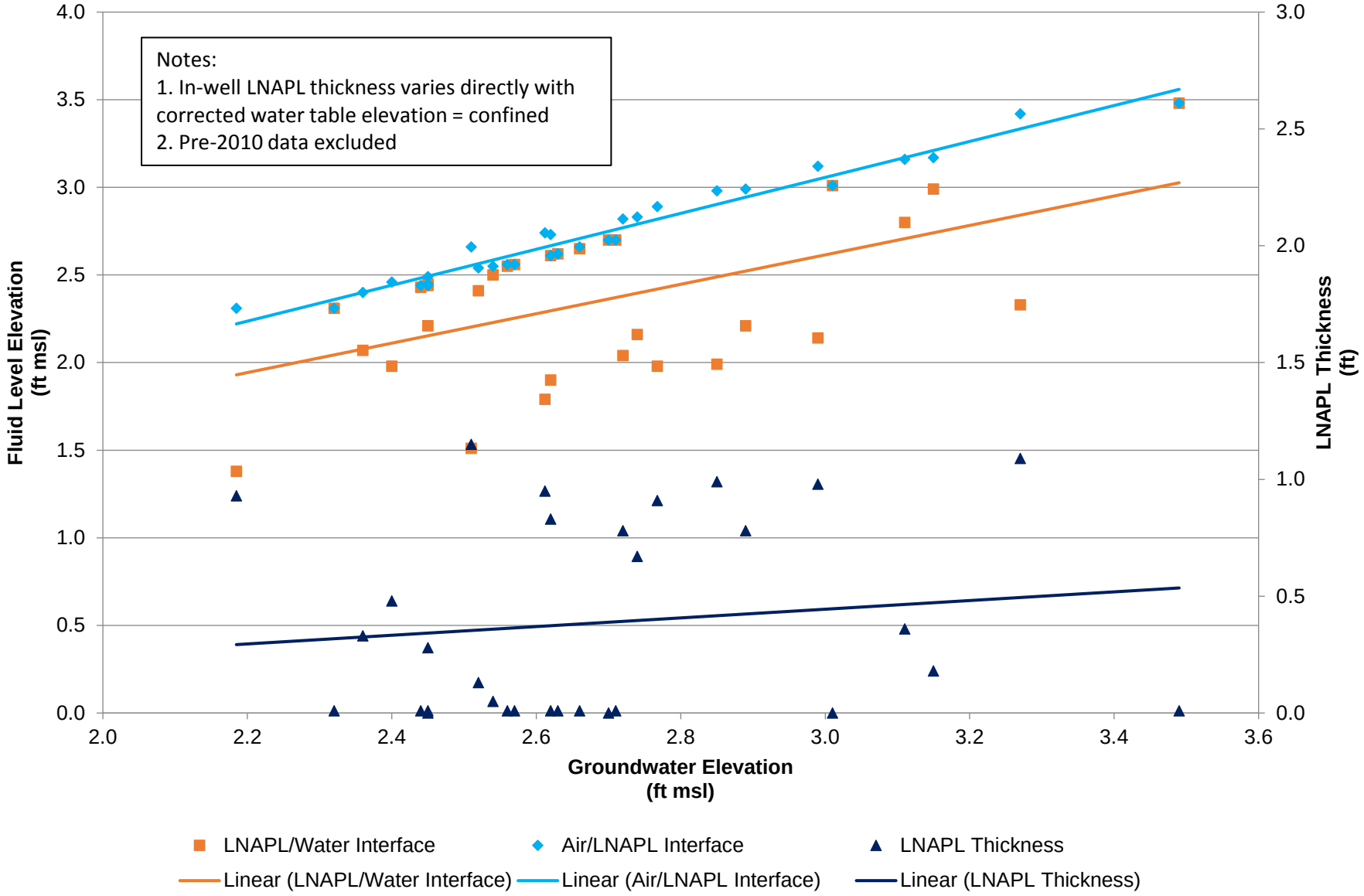

B-141: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

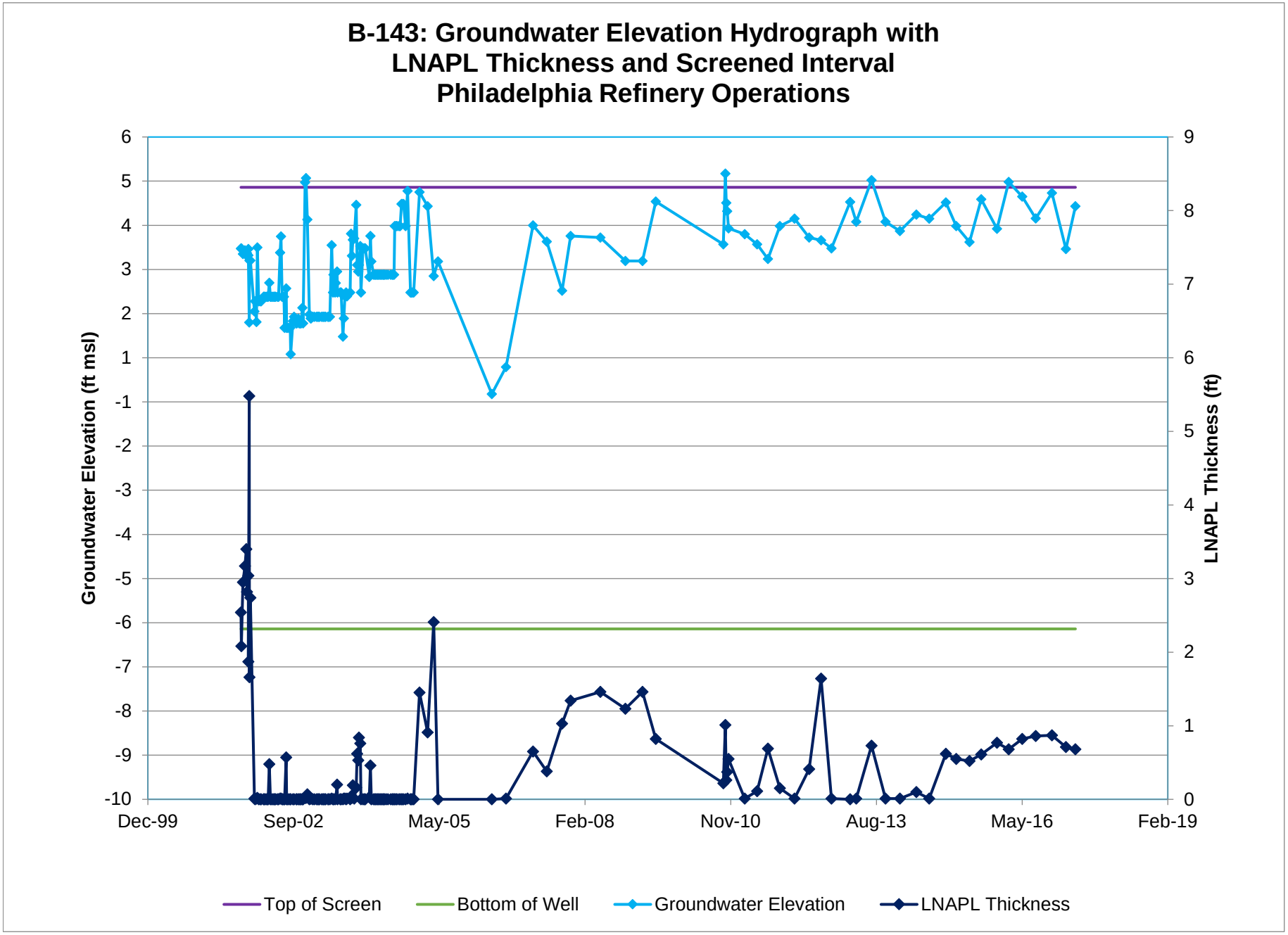
B-141: Diagnostic Gauge Plot
Philadelphia Refinery Operations



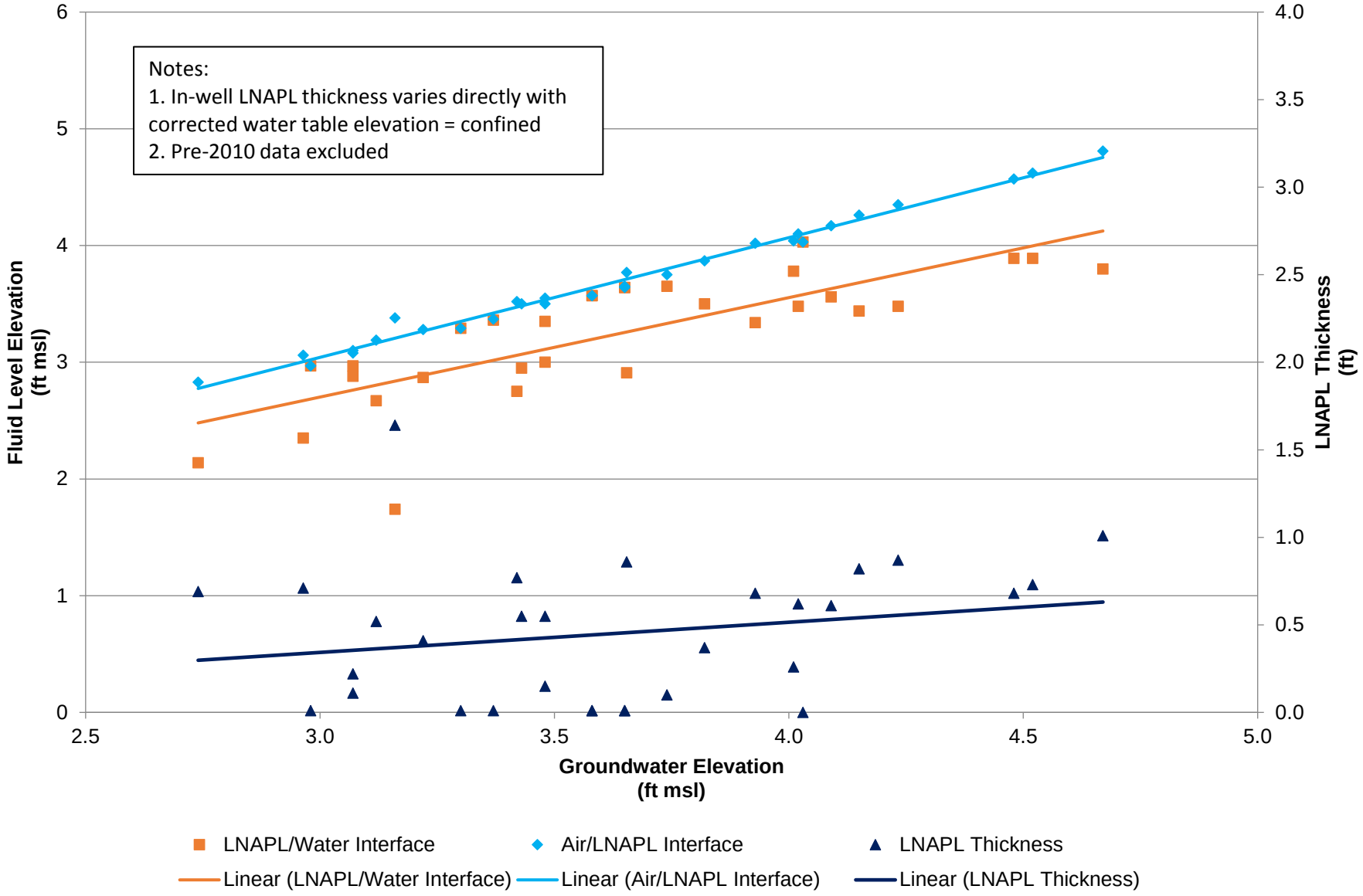

B-142: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

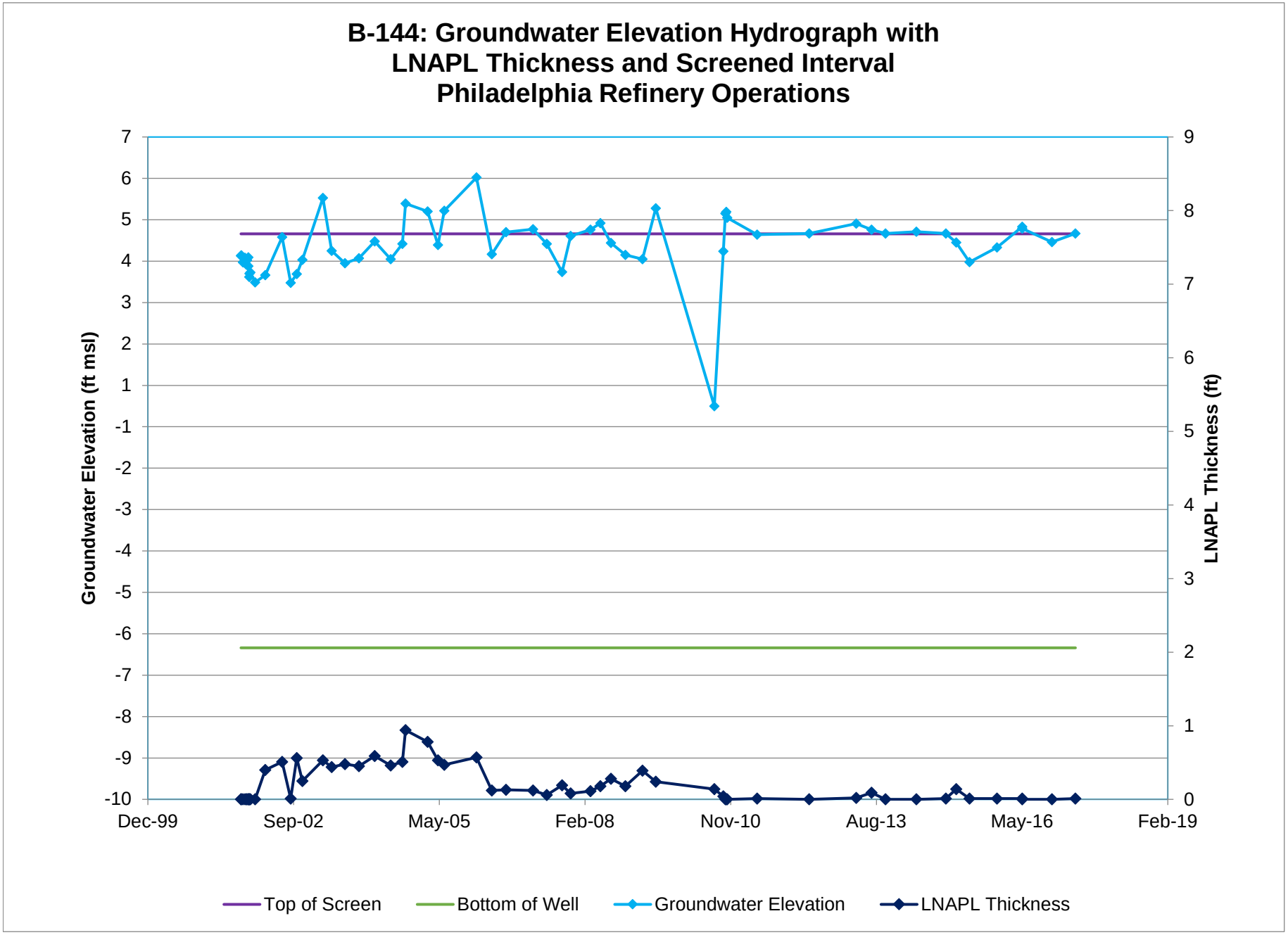
B-142: Diagnostic Gauge Plot
Philadelphia Refinery Operations



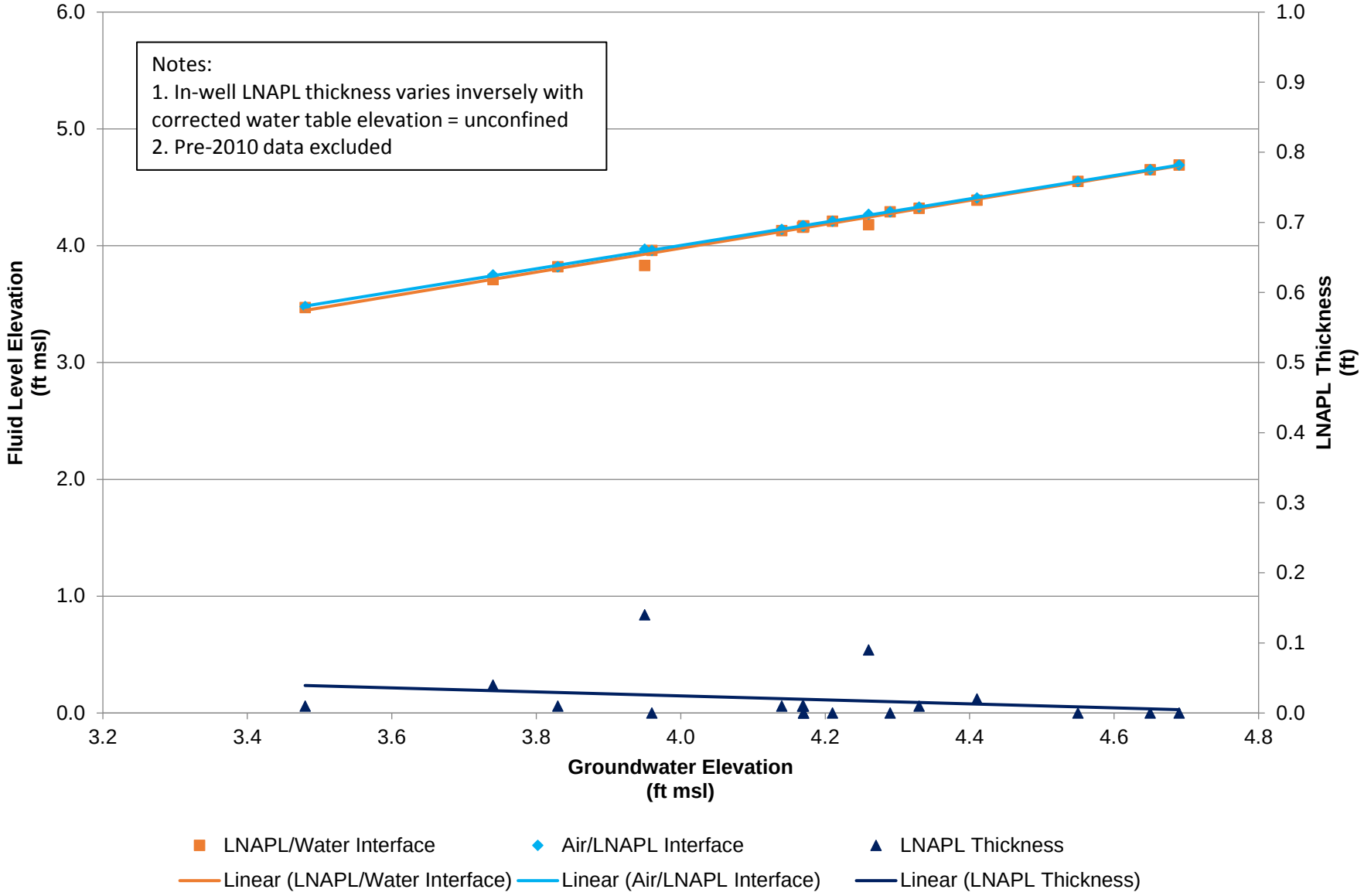

B-143: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

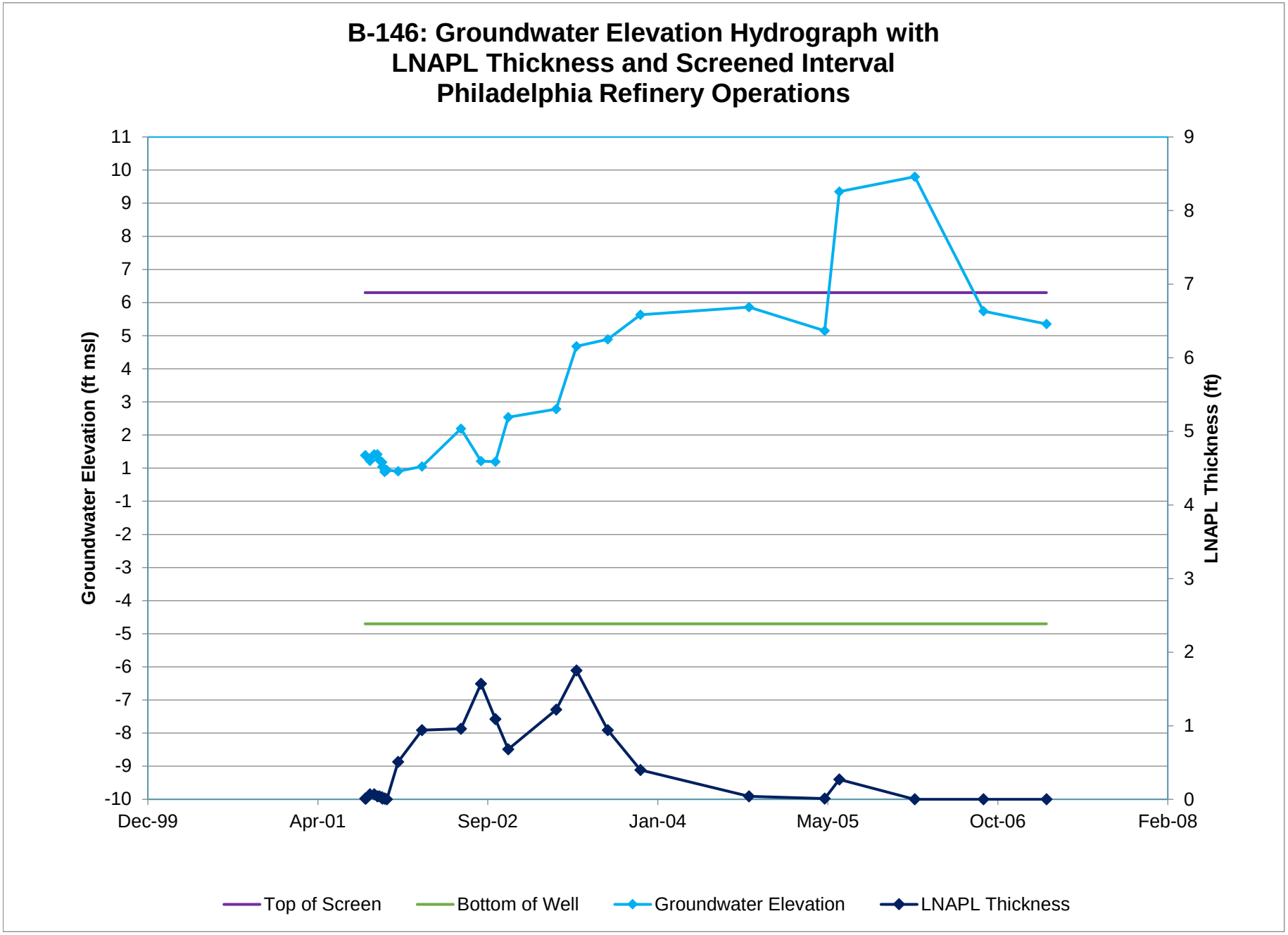
B-143: Diagnostic Gauge Plot
Philadelphia Refinery Operations

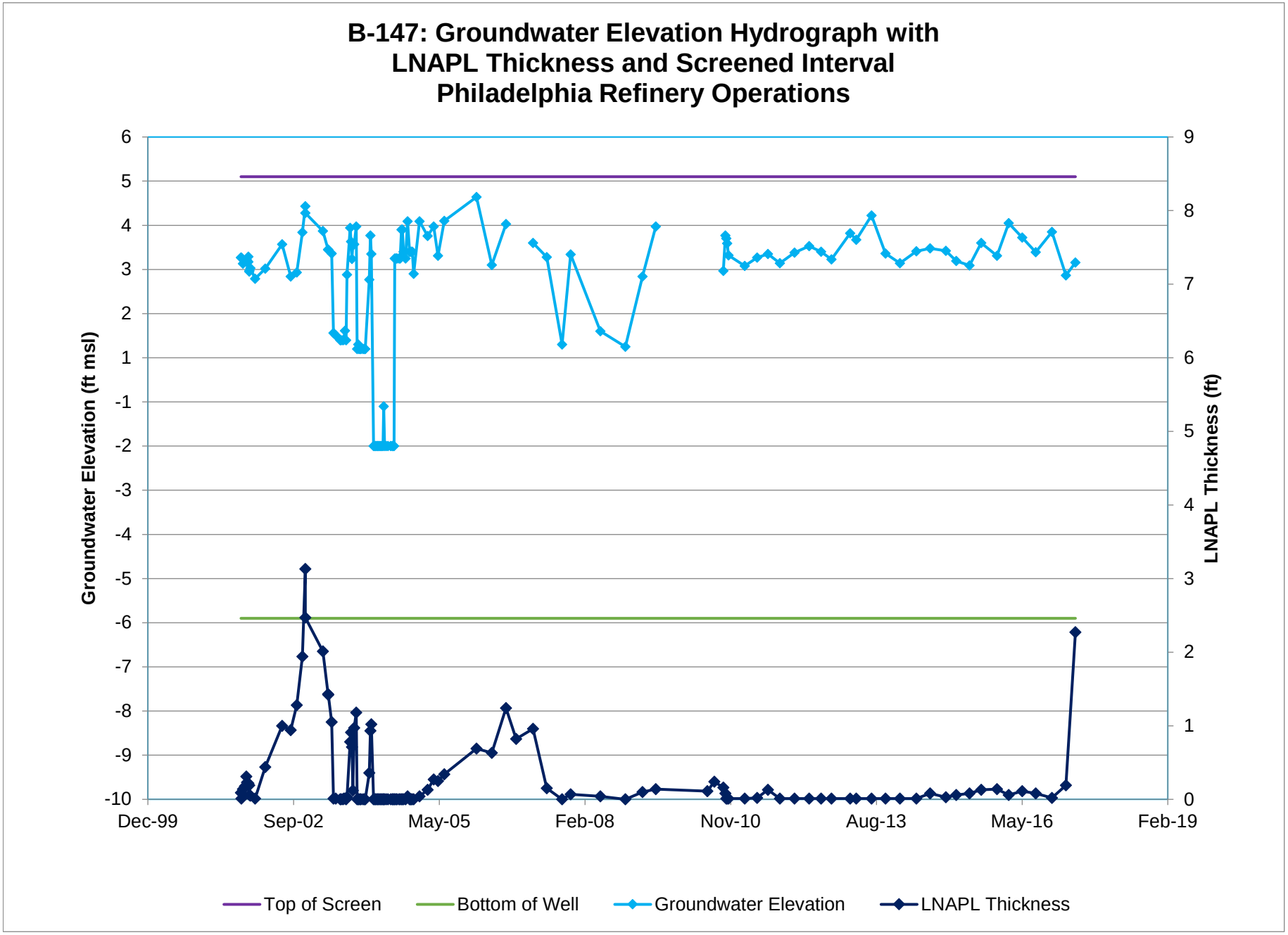



B-144: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

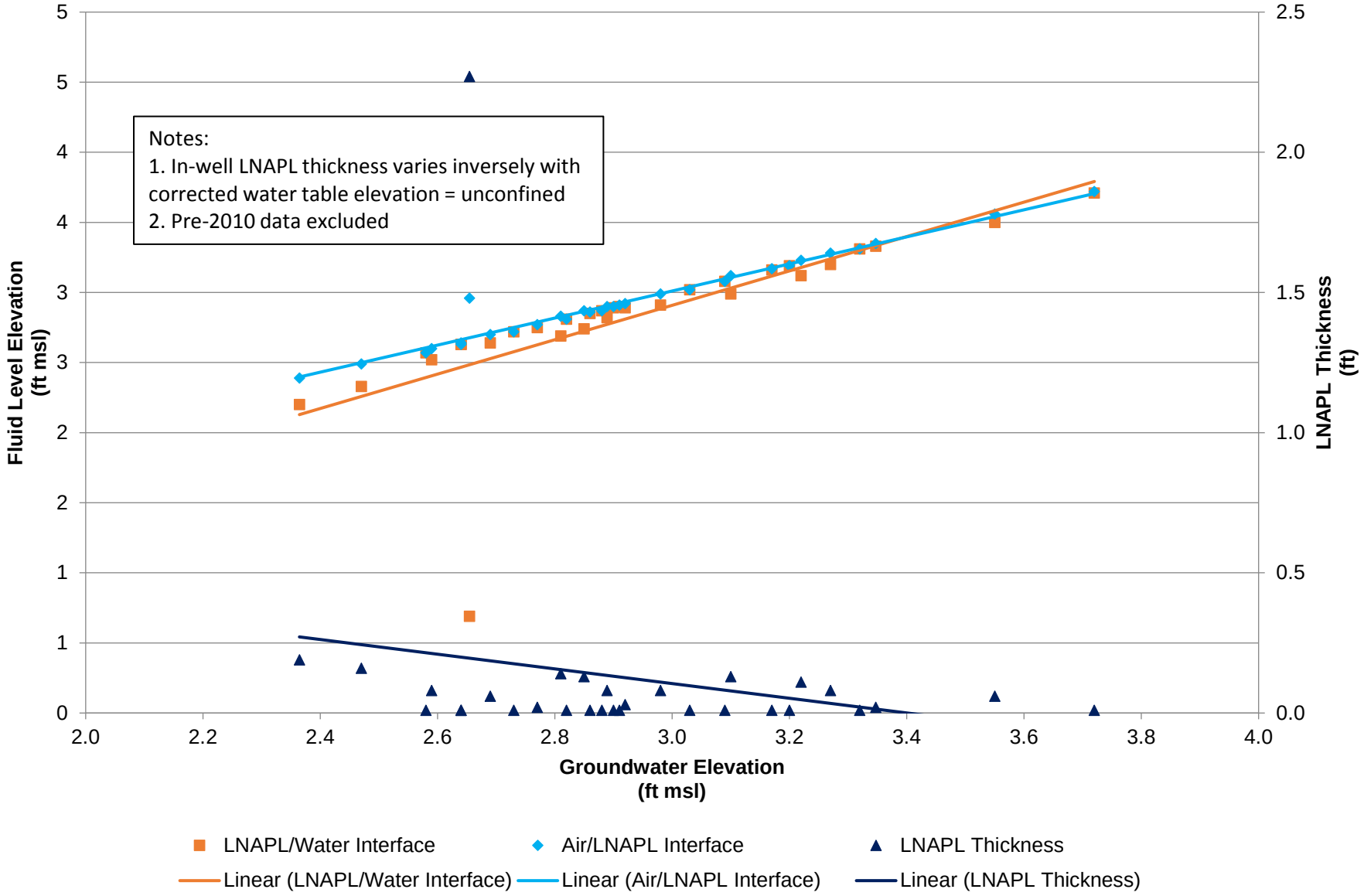
B-144: Diagnostic Gauge Plot
Philadelphia Refinery Operations

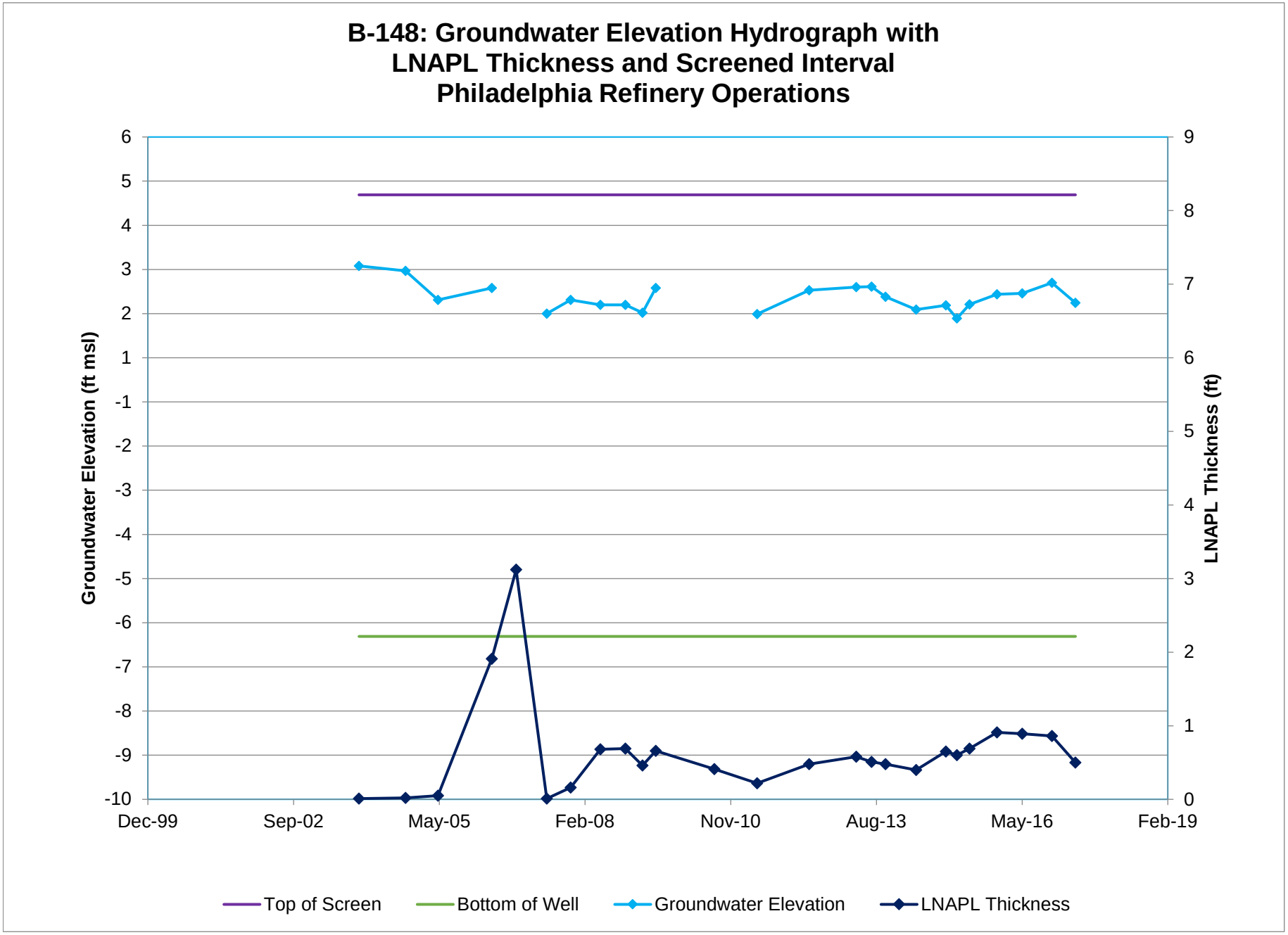



B-146: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
11
10
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

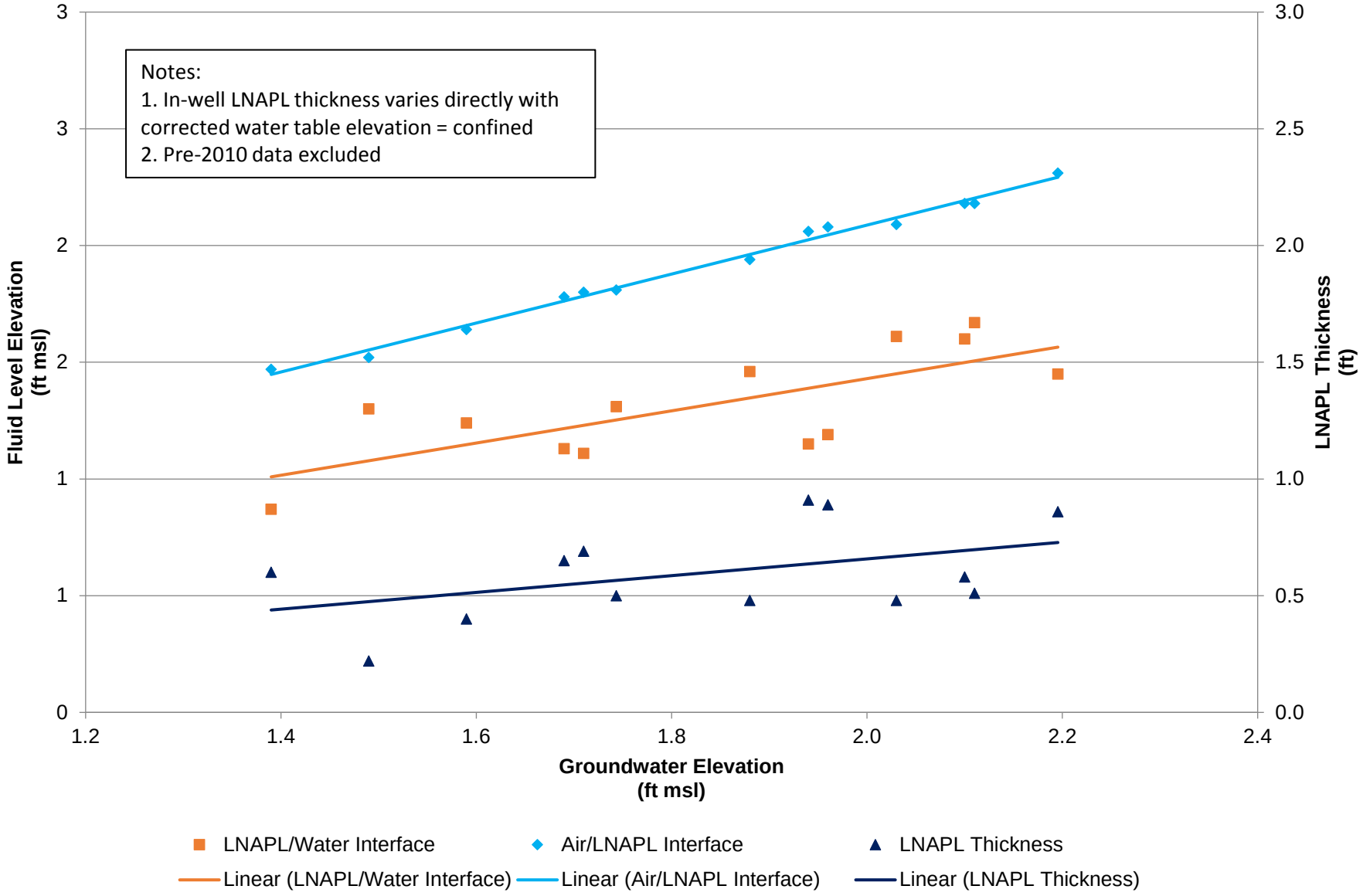

B-147: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

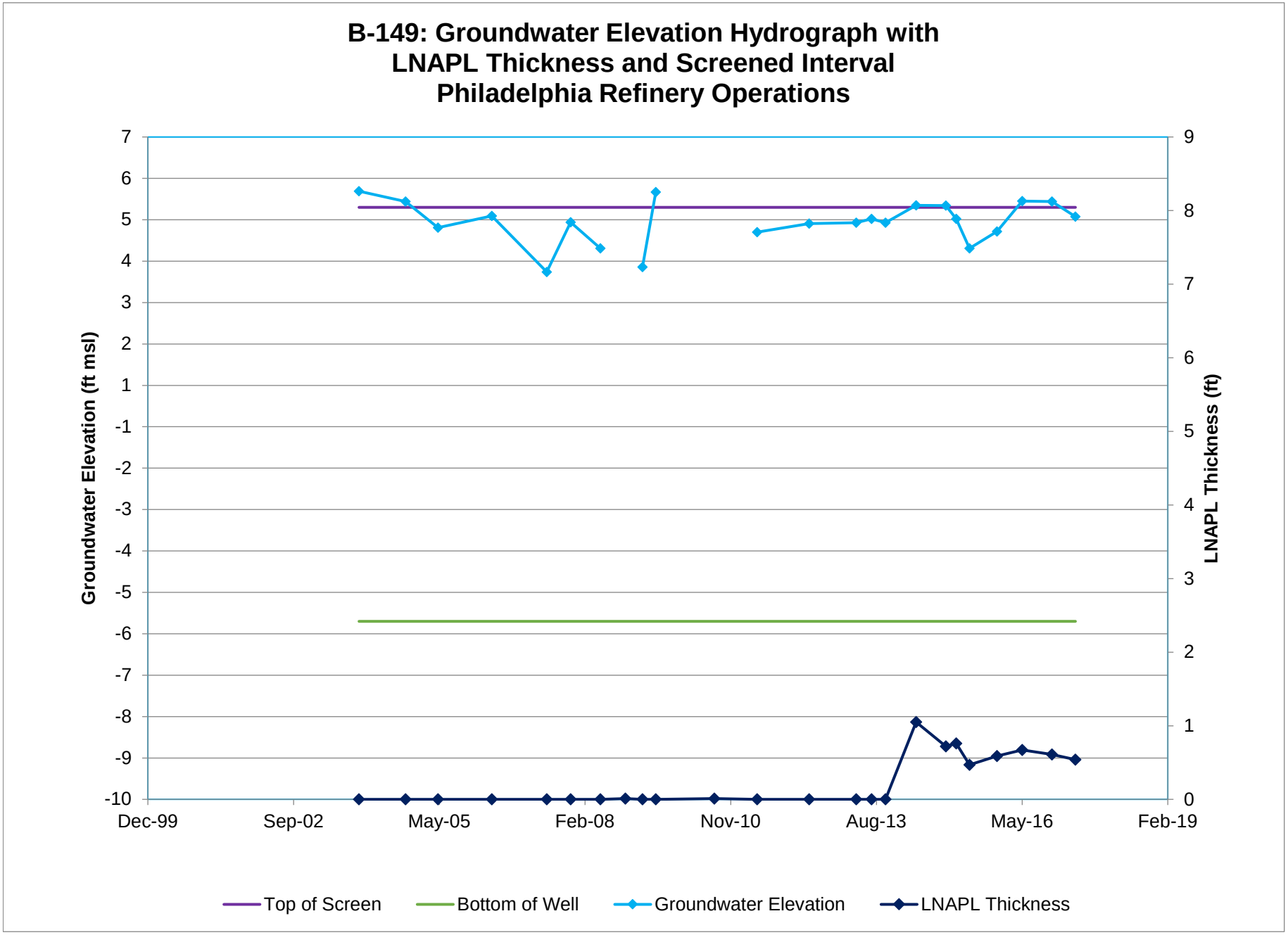
B-147: Diagnostic Gauge Plot
Philadelphia Refinery Operations



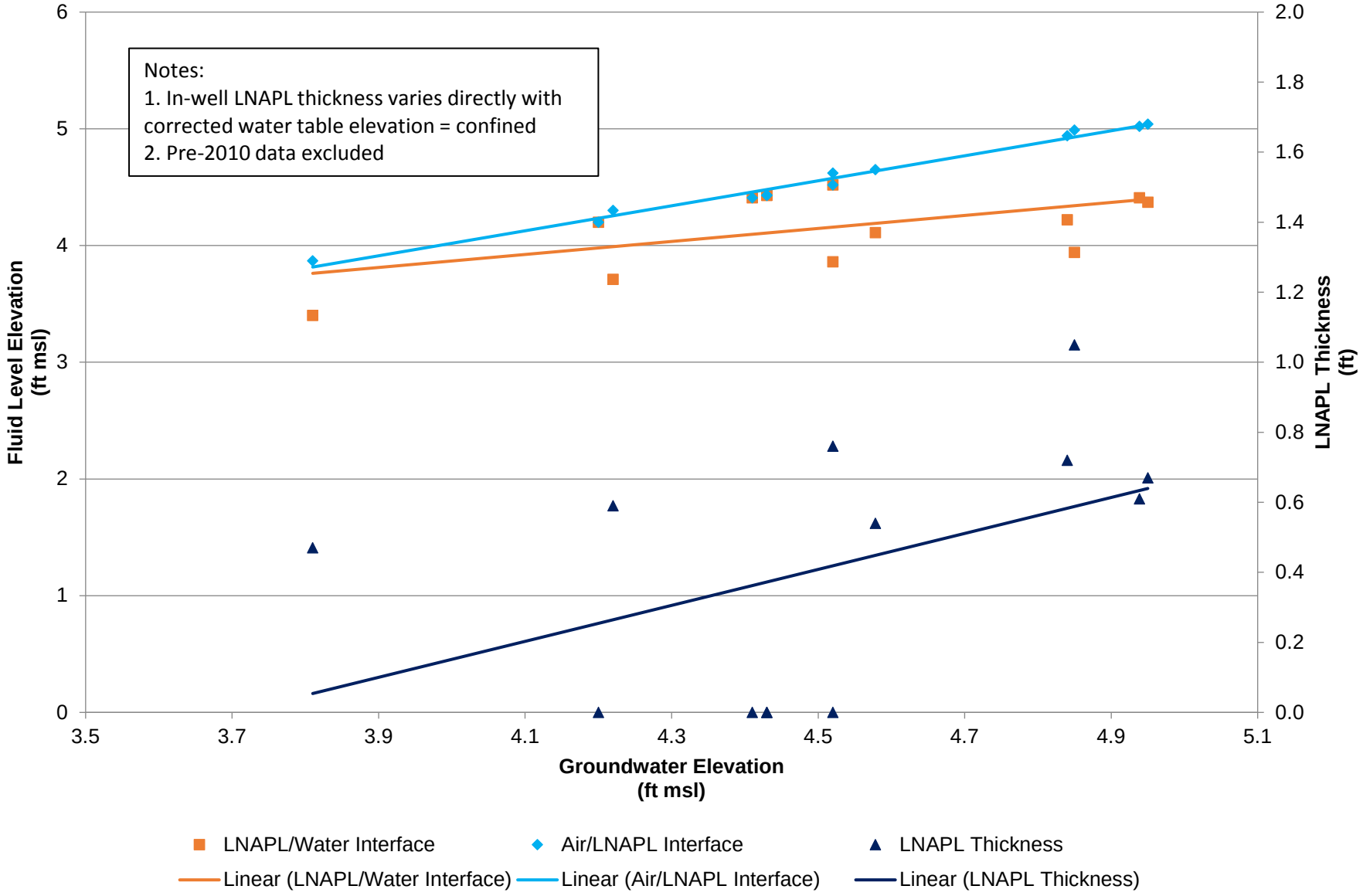

B-148: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

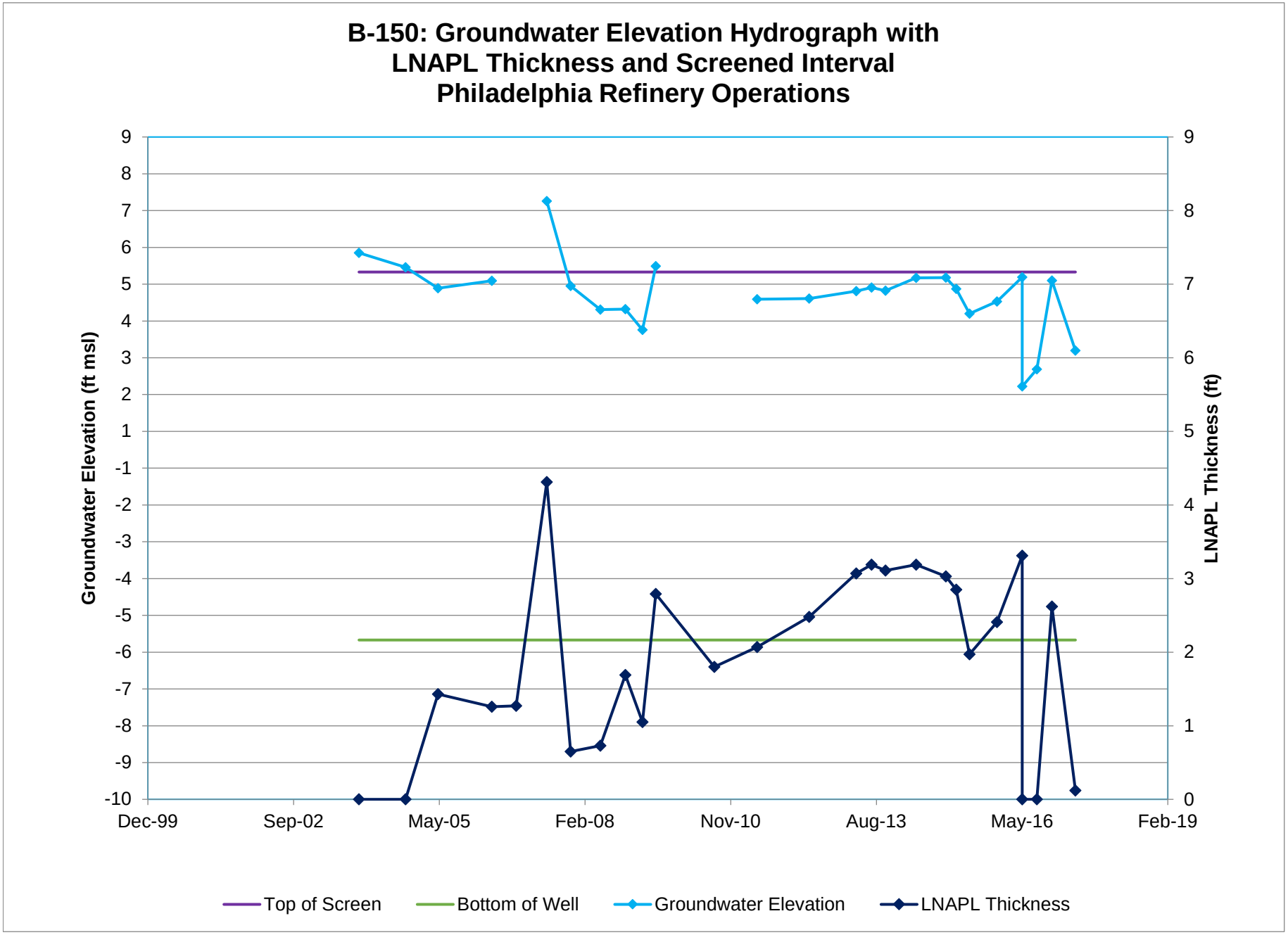
B-148: Diagnostic Gauge Plot
Philadelphia Refinery Operations



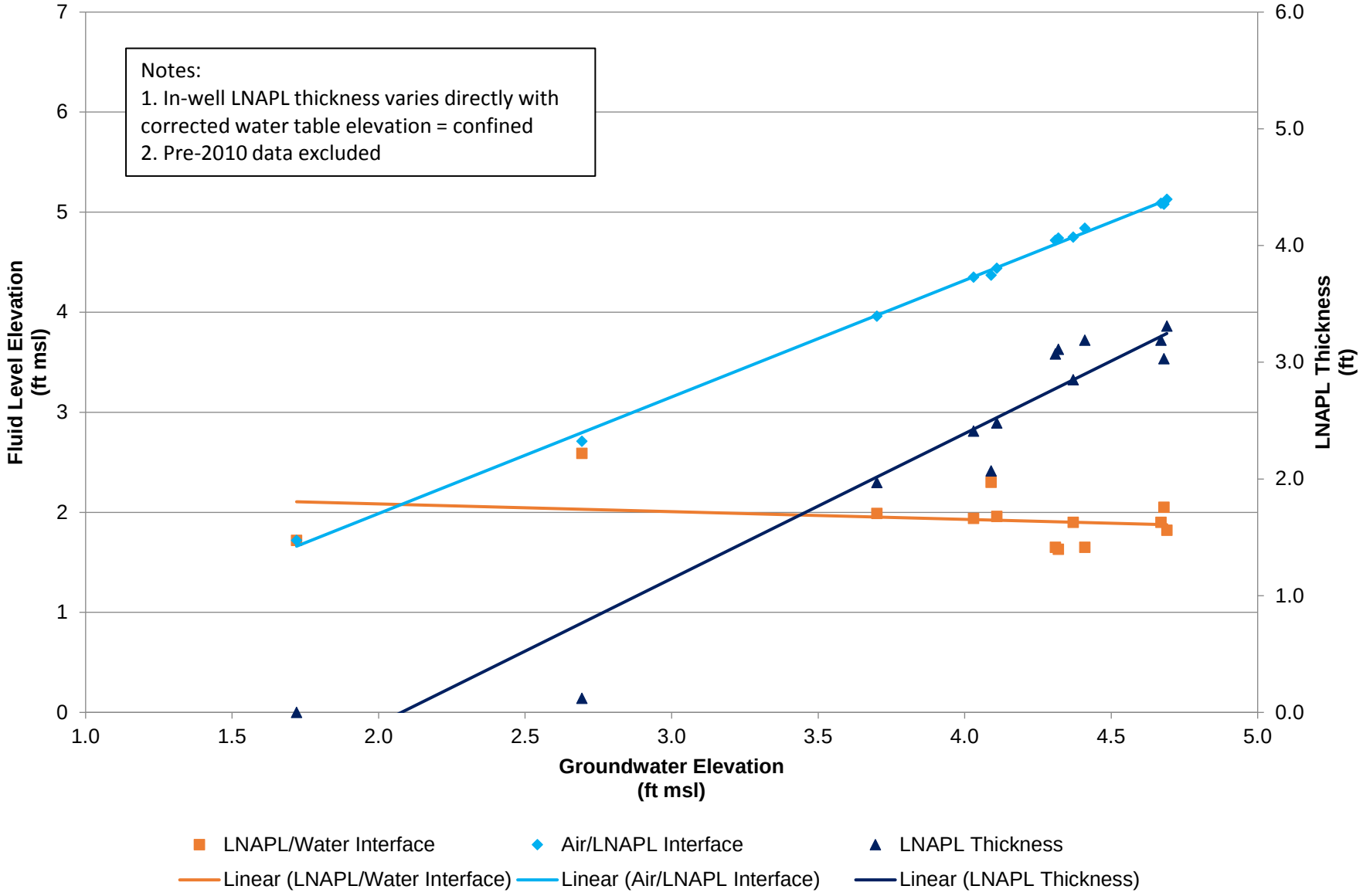

B-149: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

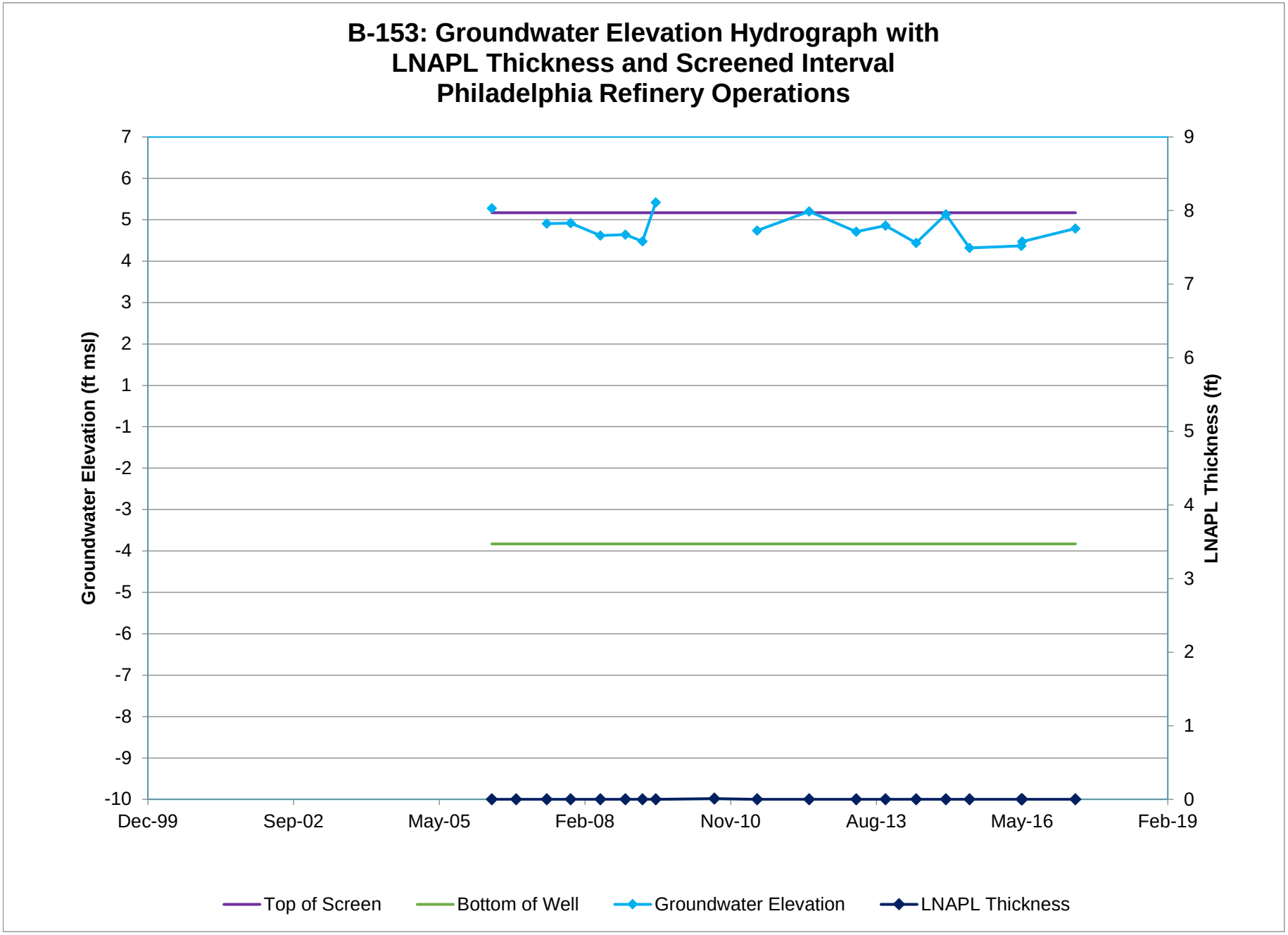
B-149: Diagnostic Gauge Plot
Philadelphia Refinery Operations

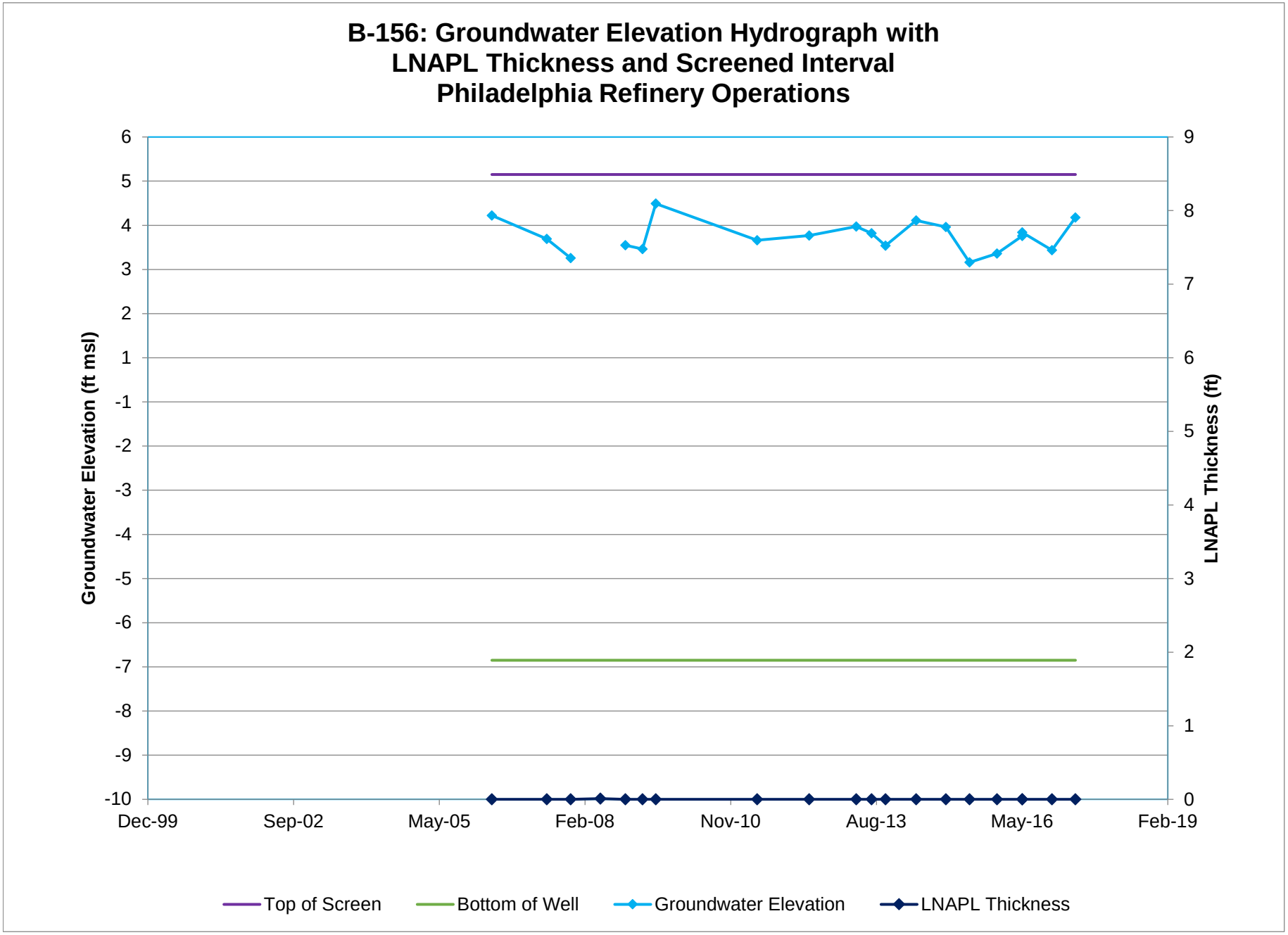


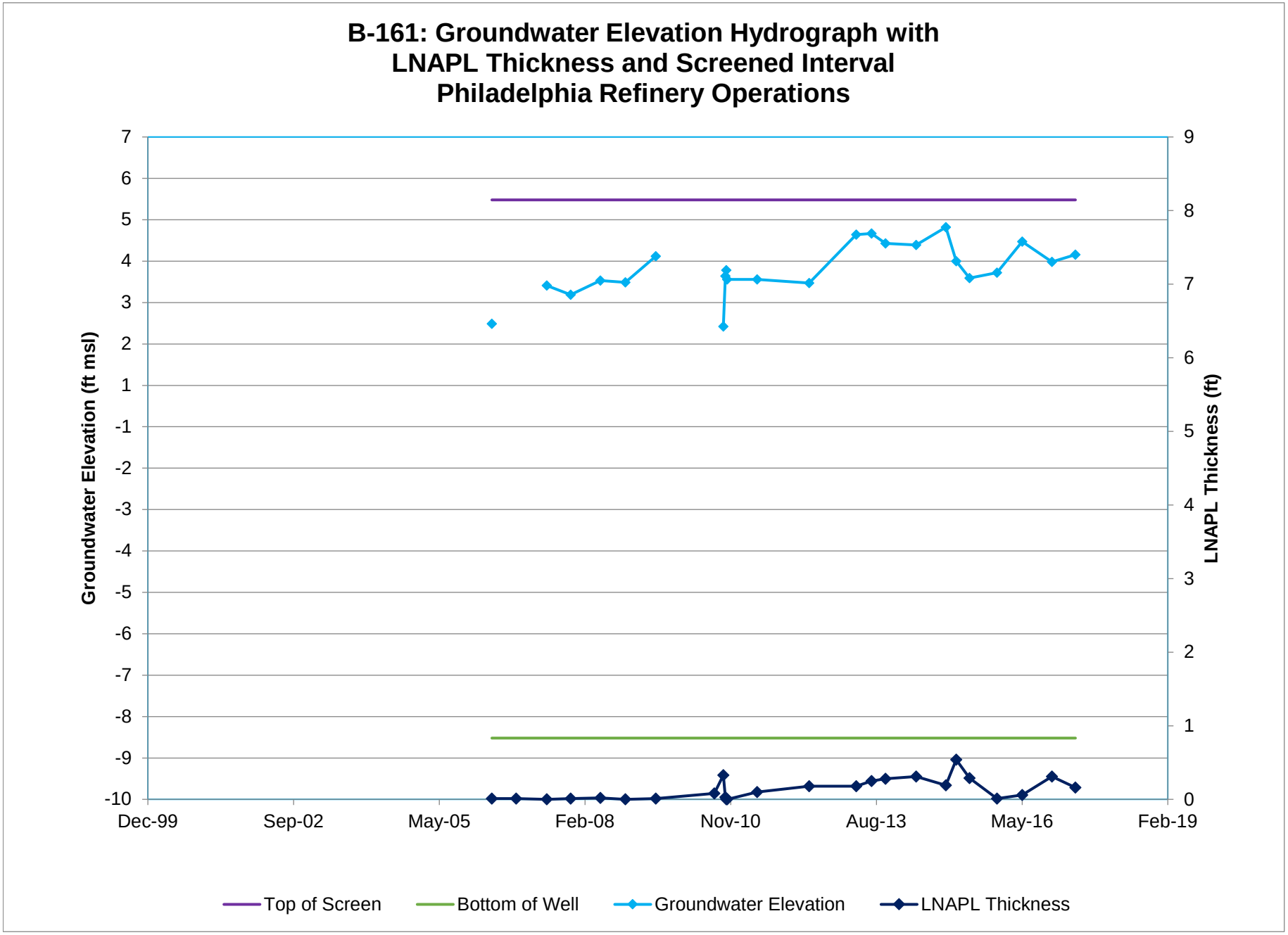

B-150: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

B-150: Diagnostic Gauge Plot
Philadelphia Refinery Operations

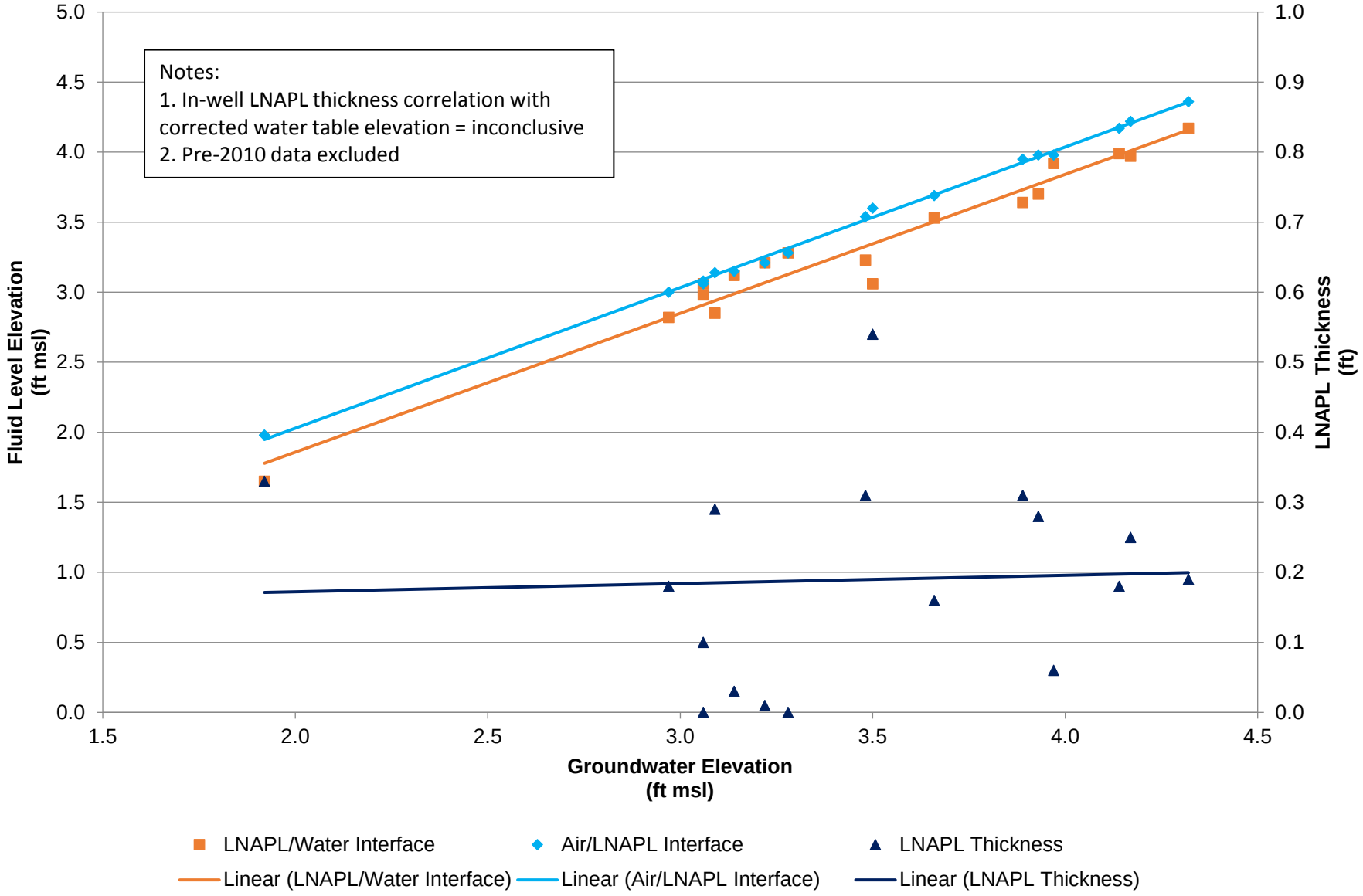


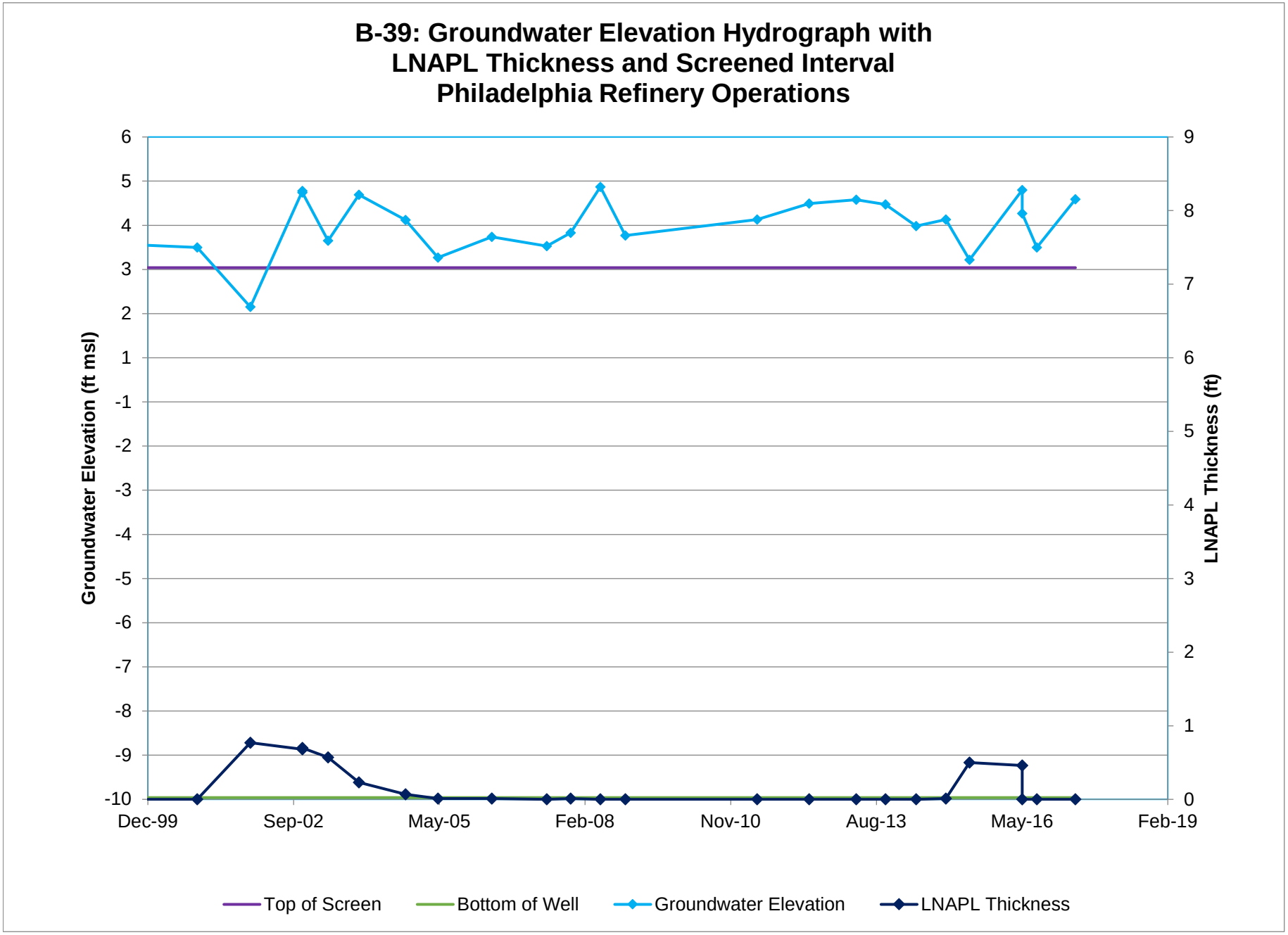

B-153: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness


B-156: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

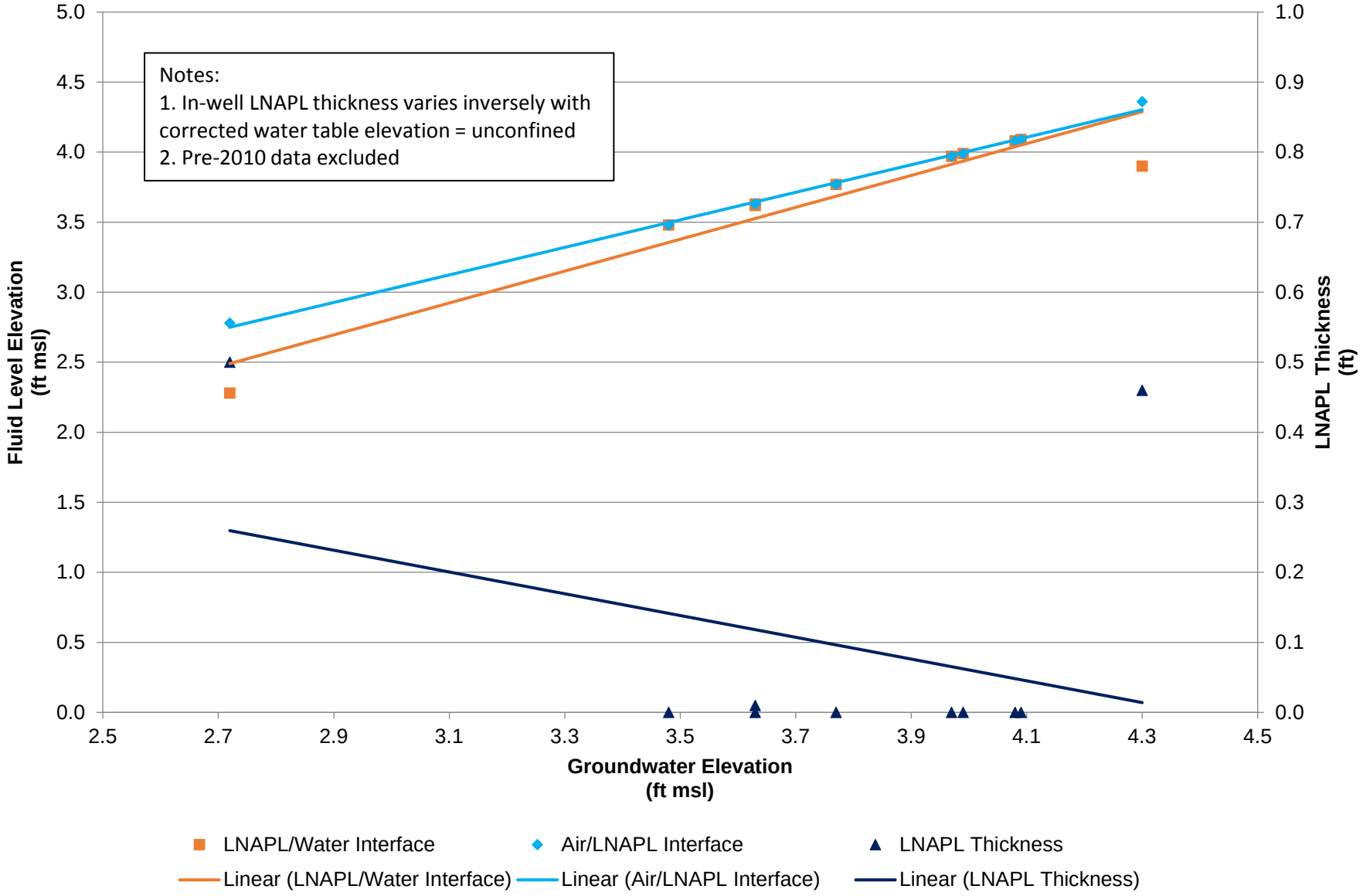

B-161: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

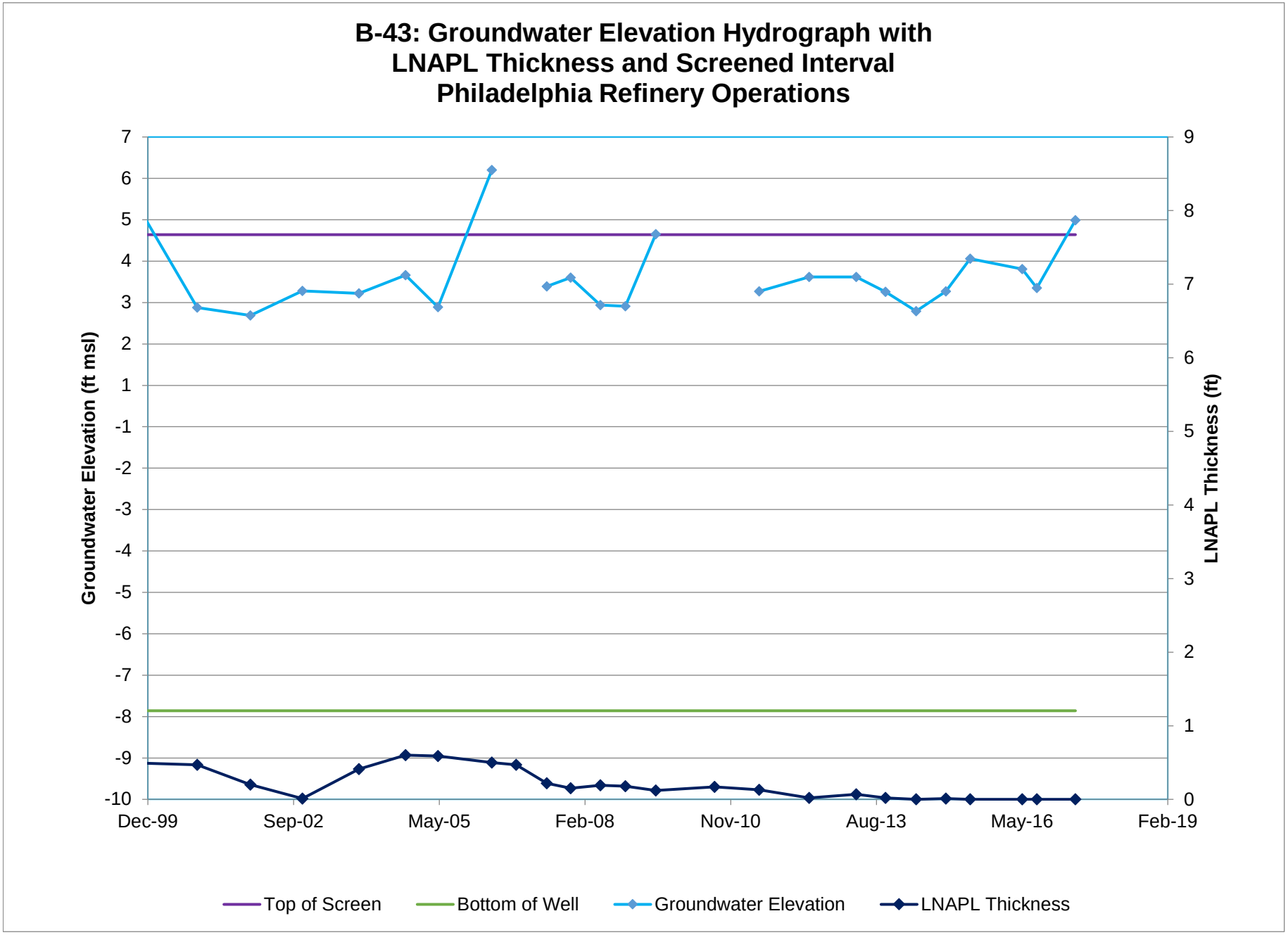
B-161: Diagnostic Gauge Plot
Philadelphia Refinery Operations



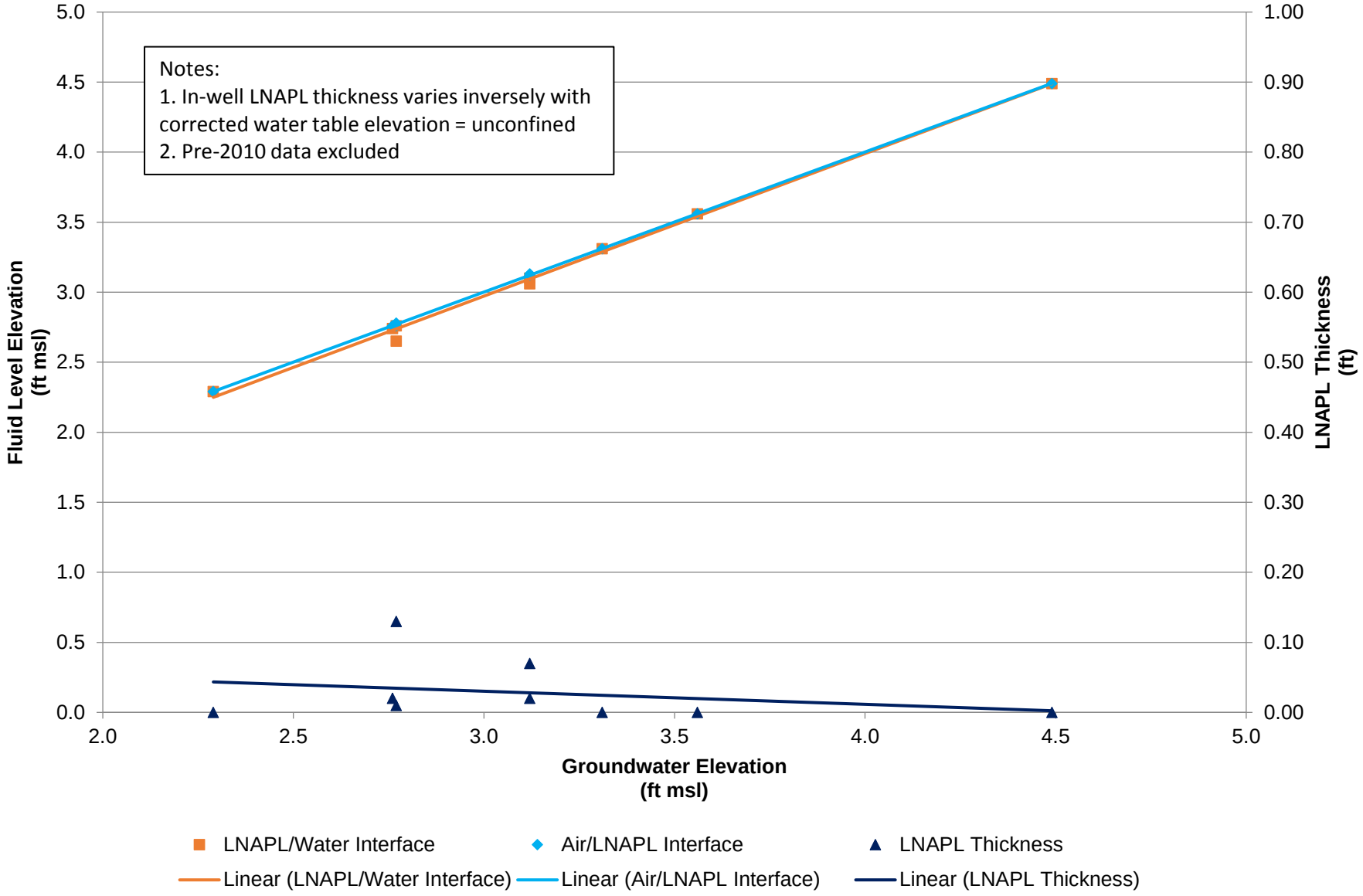

B-39: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

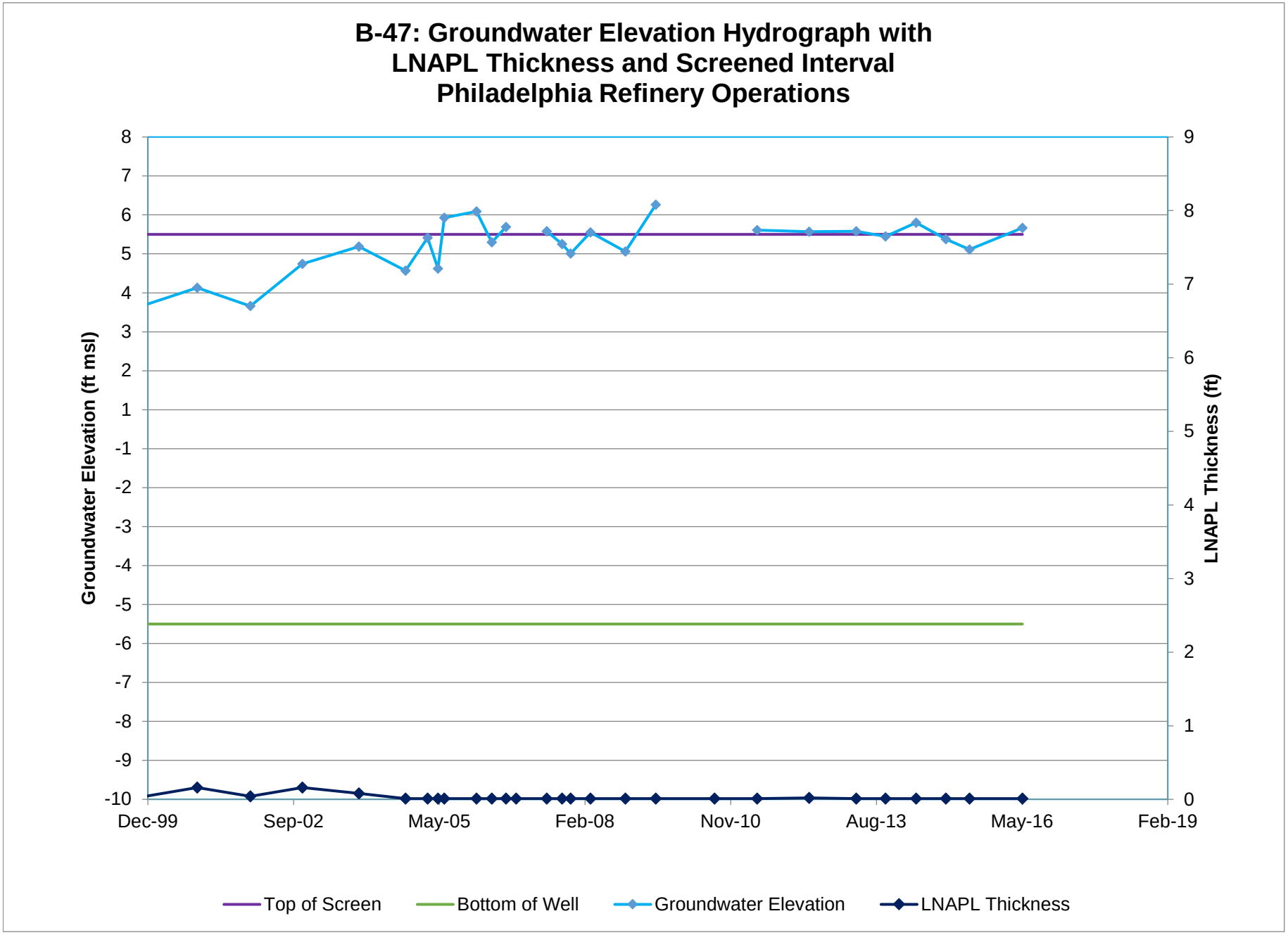
B-39: Diagnostic Gauge Plot
Philadelphia Refinery Operations



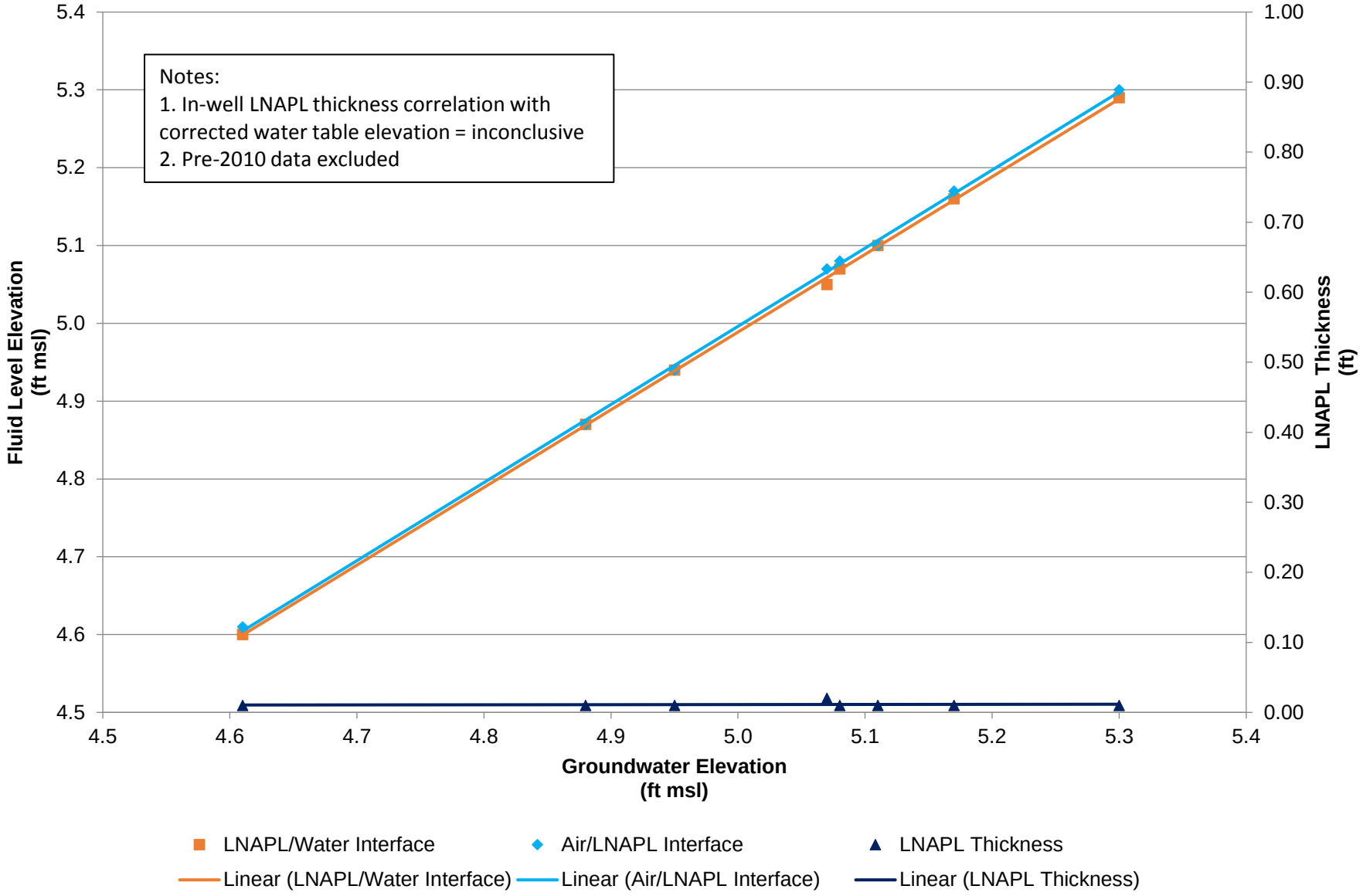

B-43: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

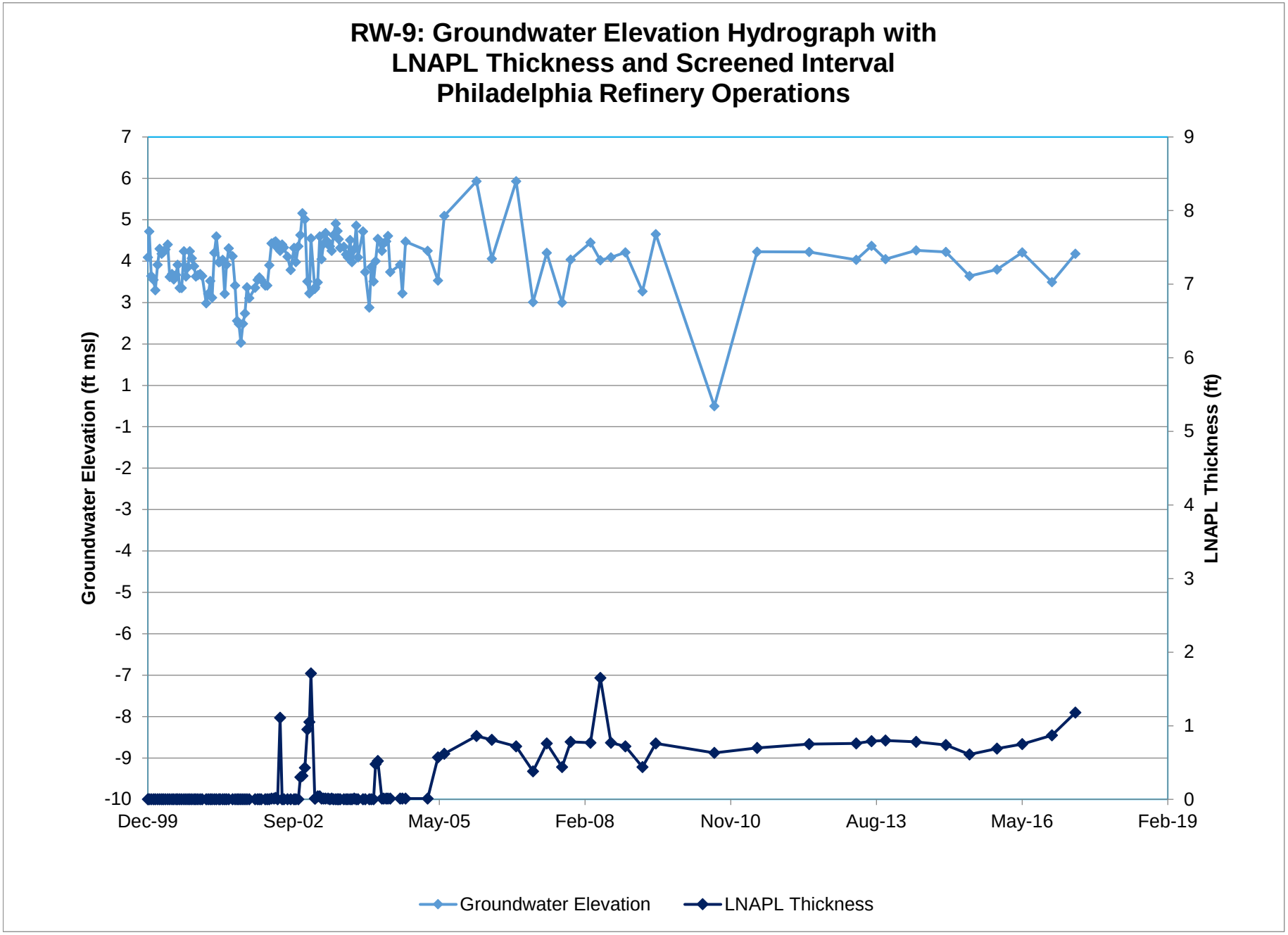
B-43: Diagnostic Gauge Plot
Philadelphia Refinery Operations

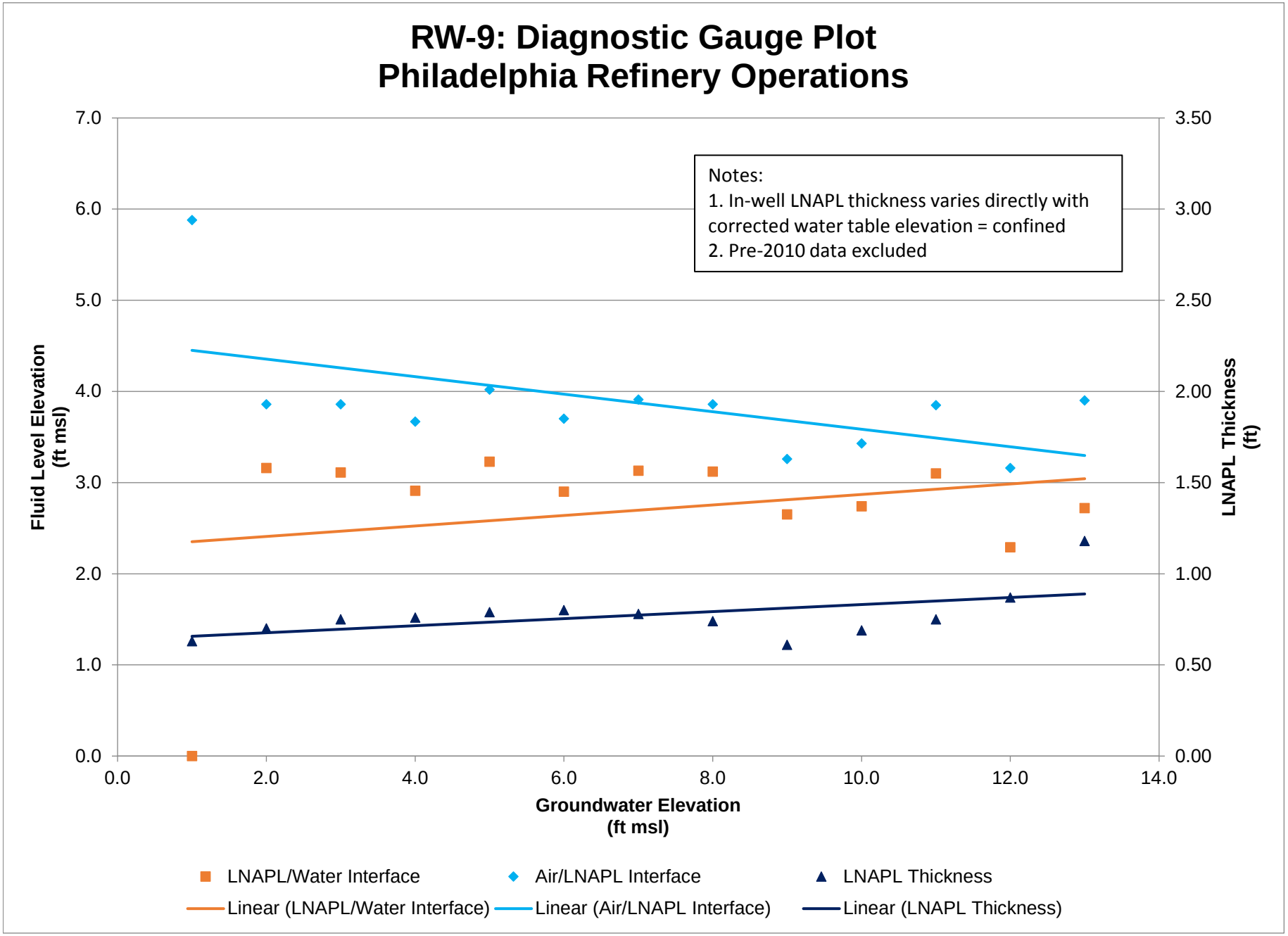


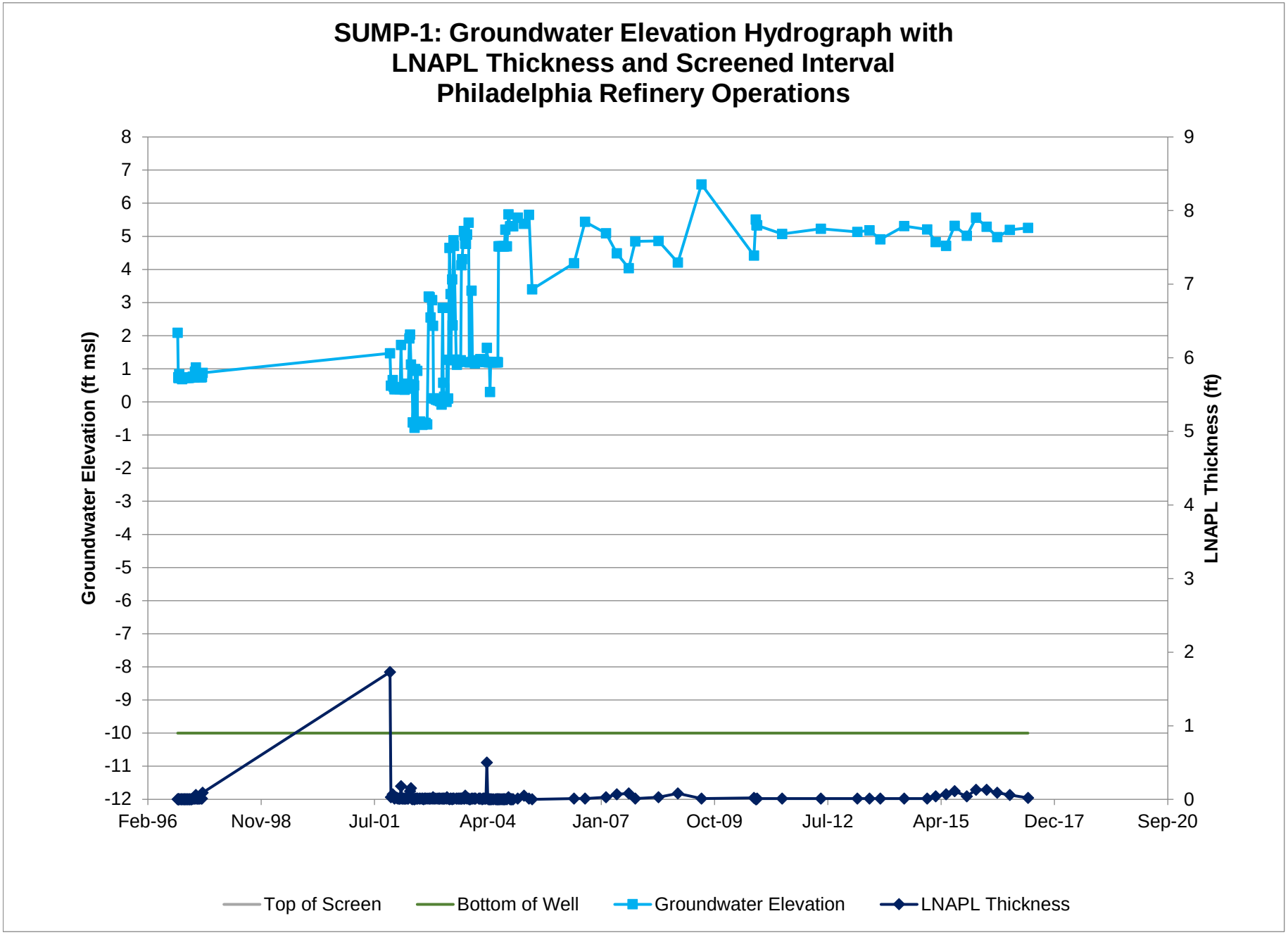

B-47: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

B-47: Diagnostic Gauge Plot
Philadelphia Refinery Operations

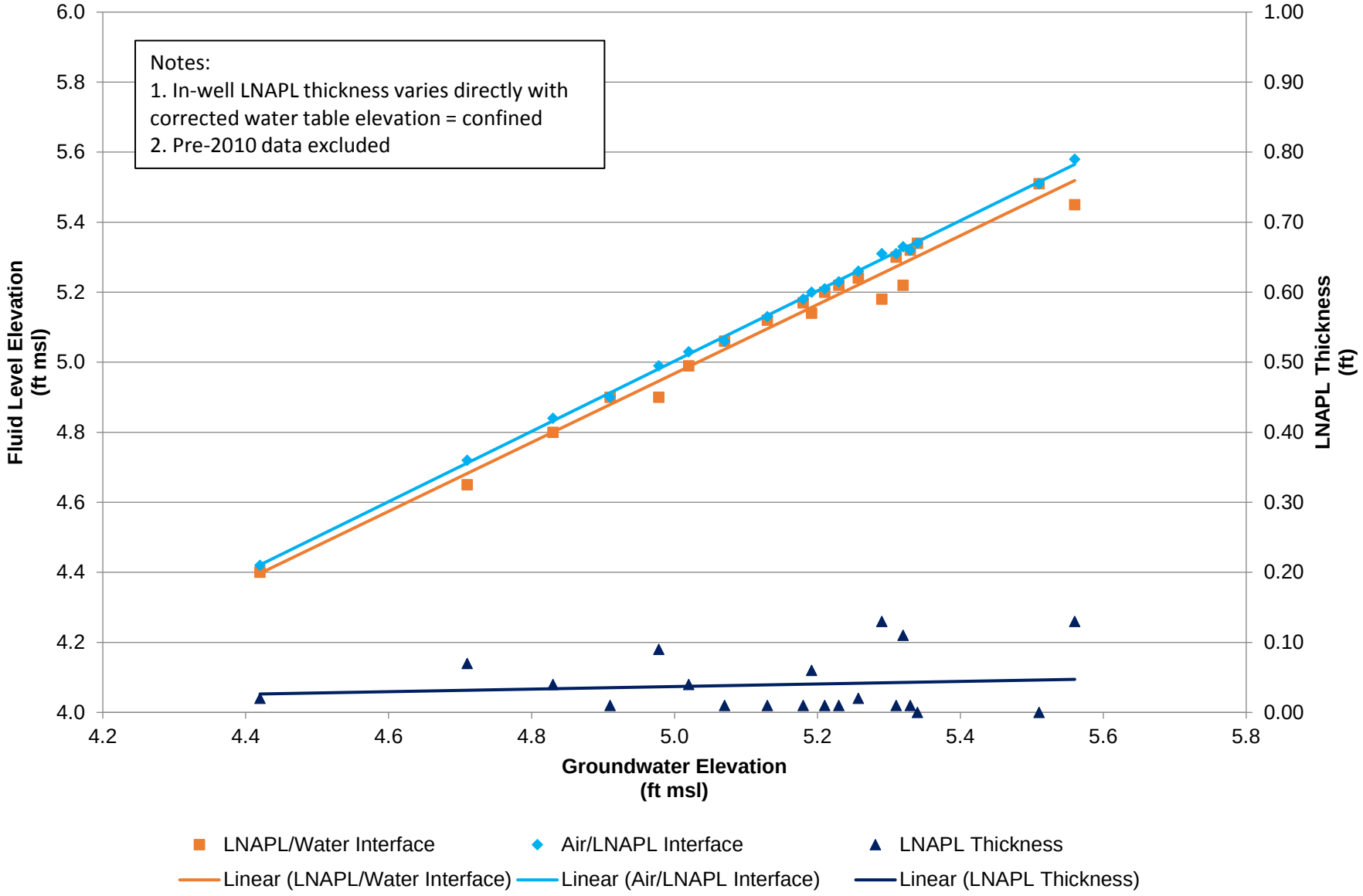


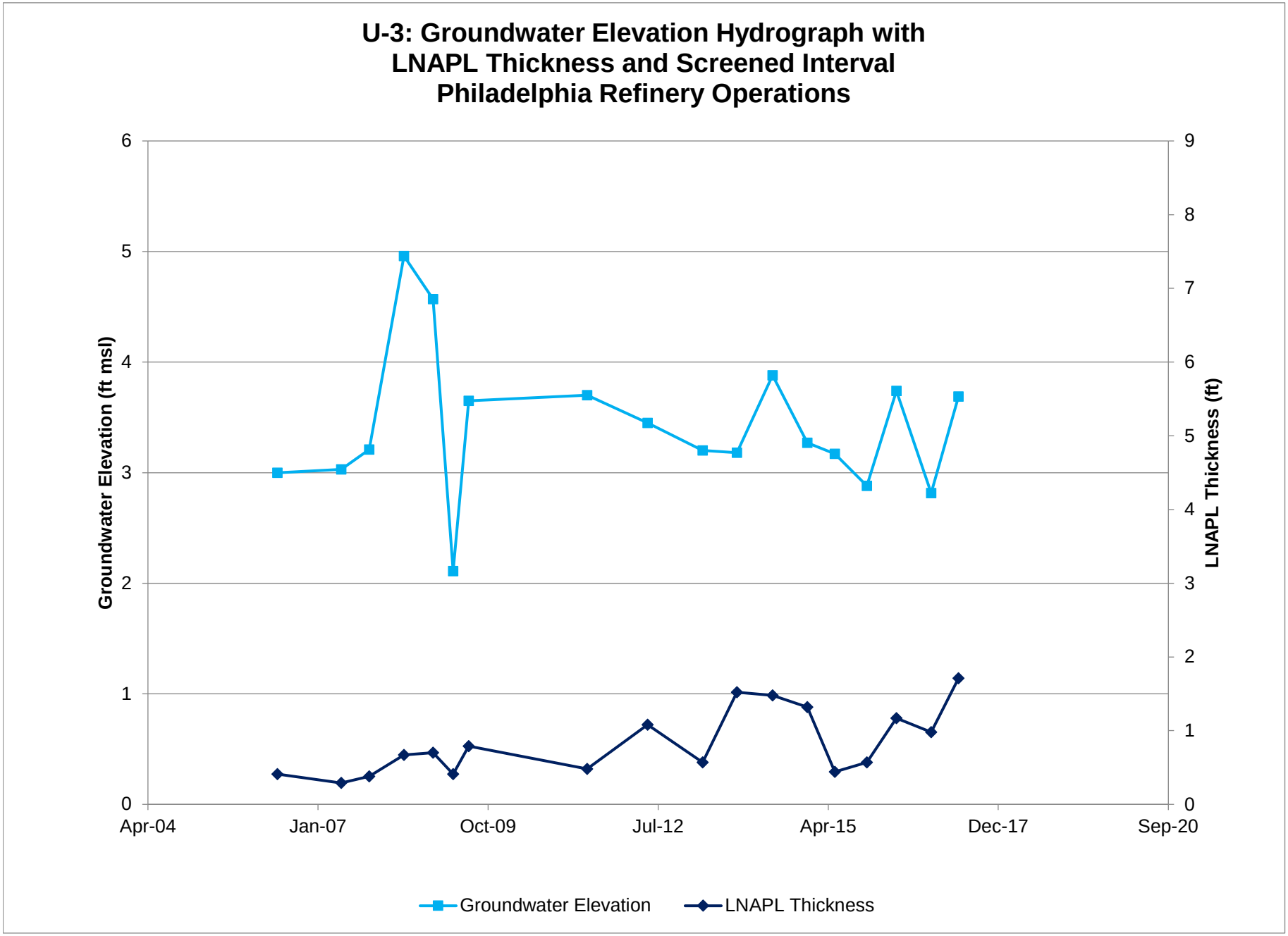

RW-9: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
9
8
7
6
5
4
3
2
1
0
Dec-99
Sep-02
May-05
Feb-08
Nov-10
Aug-13
May-16
Feb-19
Groundwater Elevation
LNAPL Thickness


RW-9: Diagnostic Gauge Plot
Philadelphia Refinery Operations
Notes:
1. In-well LNAPL thickness varies directly with corrected water table elevation = confined
2. Pre-2010 data excluded
Fluid Level Elevation (ft msl)
LNAPL Thickness (ft)
Groundwater Elevation (ft msl)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
LNAPL/Water Interface
Air/LNAPL Interface
LNAPL Thickness
Linear (LNAPL/Water Interface)
Linear (Air/LNAPL Interface)
Linear (LNAPL Thickness)

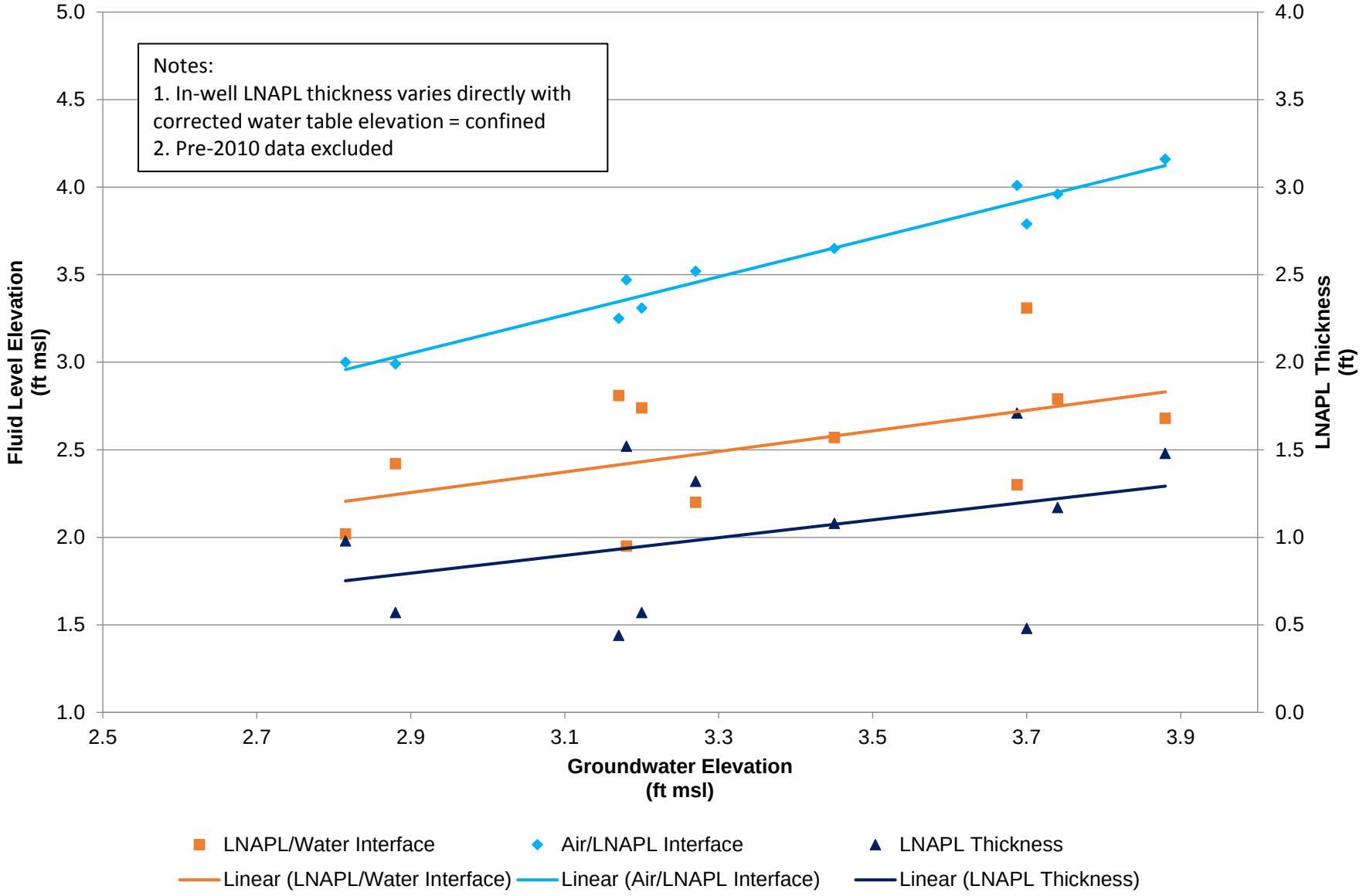

SUMP-1: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
9
8
7
6
5
4
3
2
1
0
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

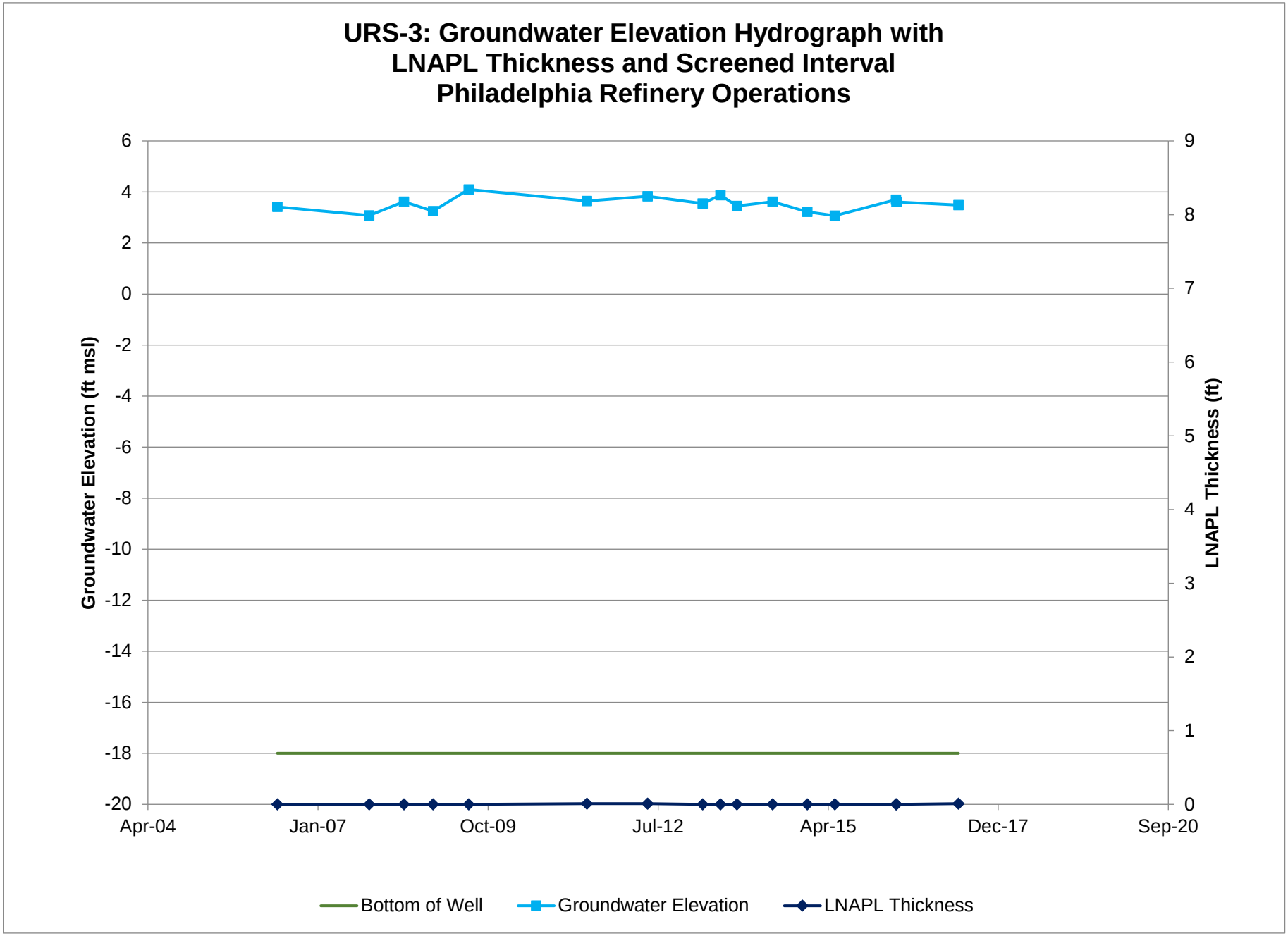
Sump-1: Diagnostic Gauge Plot
Philadelphia Refinery Operations



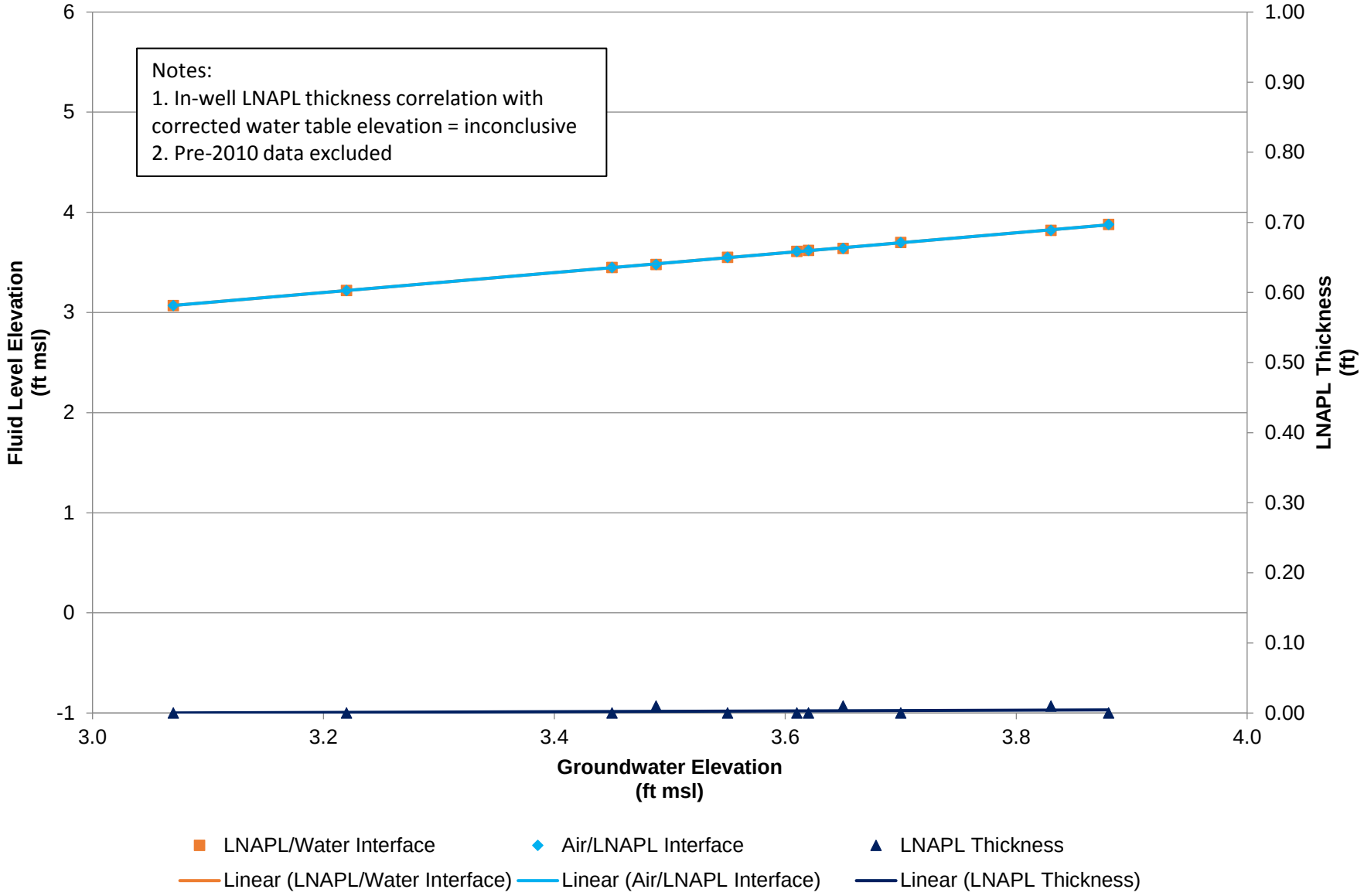

U-3: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
0
1
2
3
4
5
6
0
1
2
3
4
5
6
7
8
9
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Groundwater Elevation
LNAPL Thickness

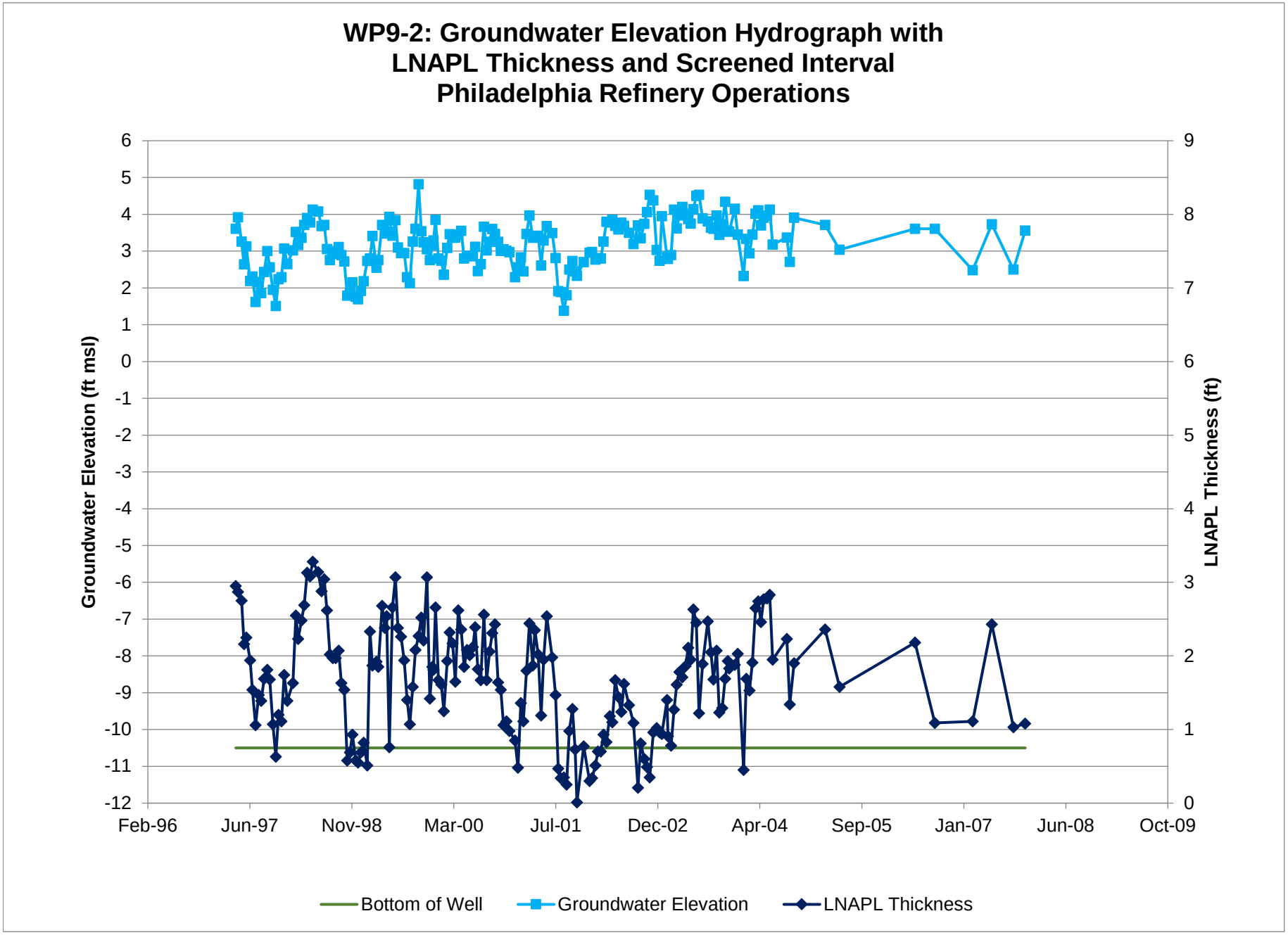
U-3: Diagnostic Gauge Plot
Philadelphia Refinery Operations

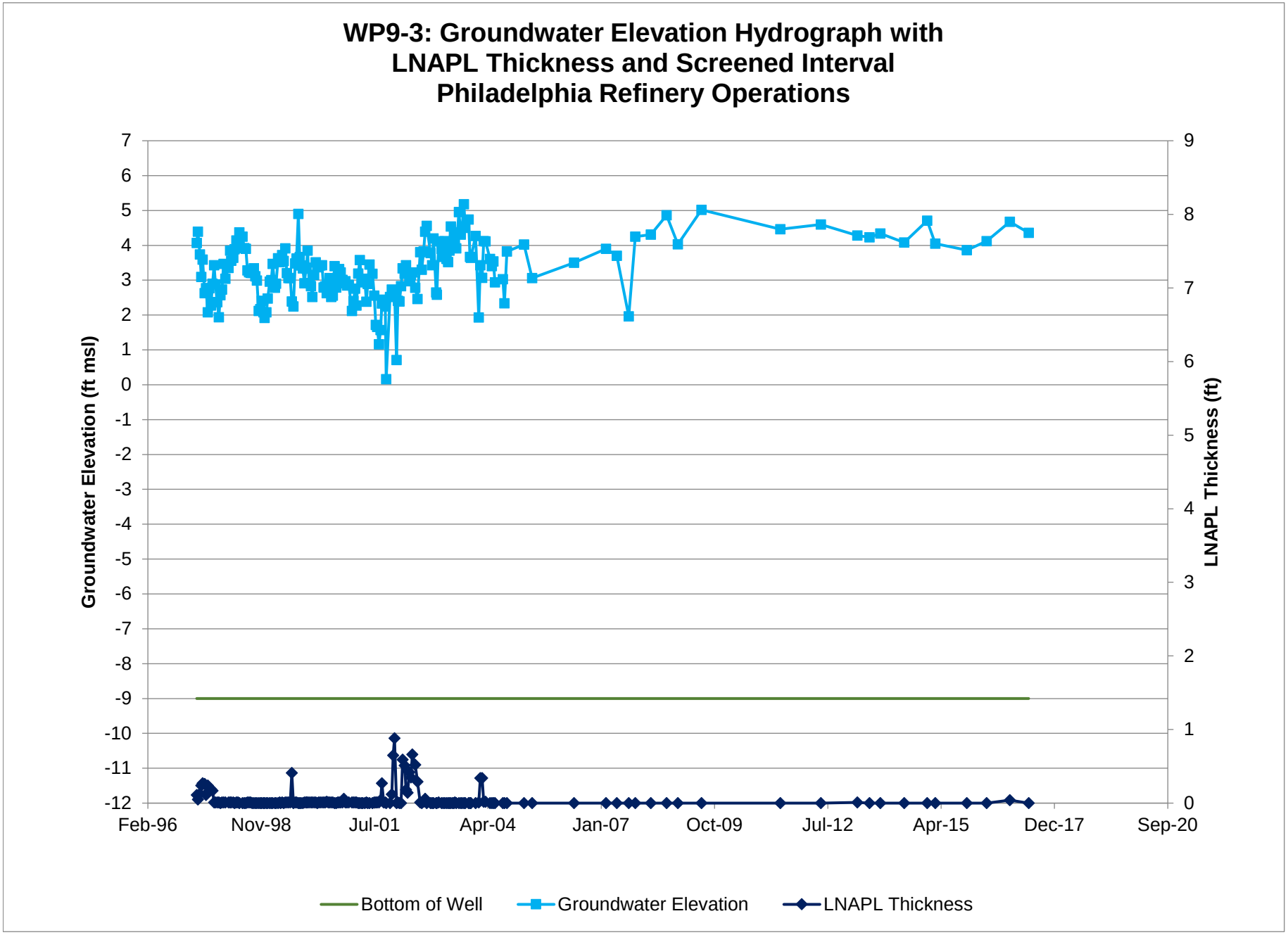



URS-3: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
9
8
7
6
5
4
3
2
1
0
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Bottom of Well
Groundwater Elevation
LNAPL Thickness

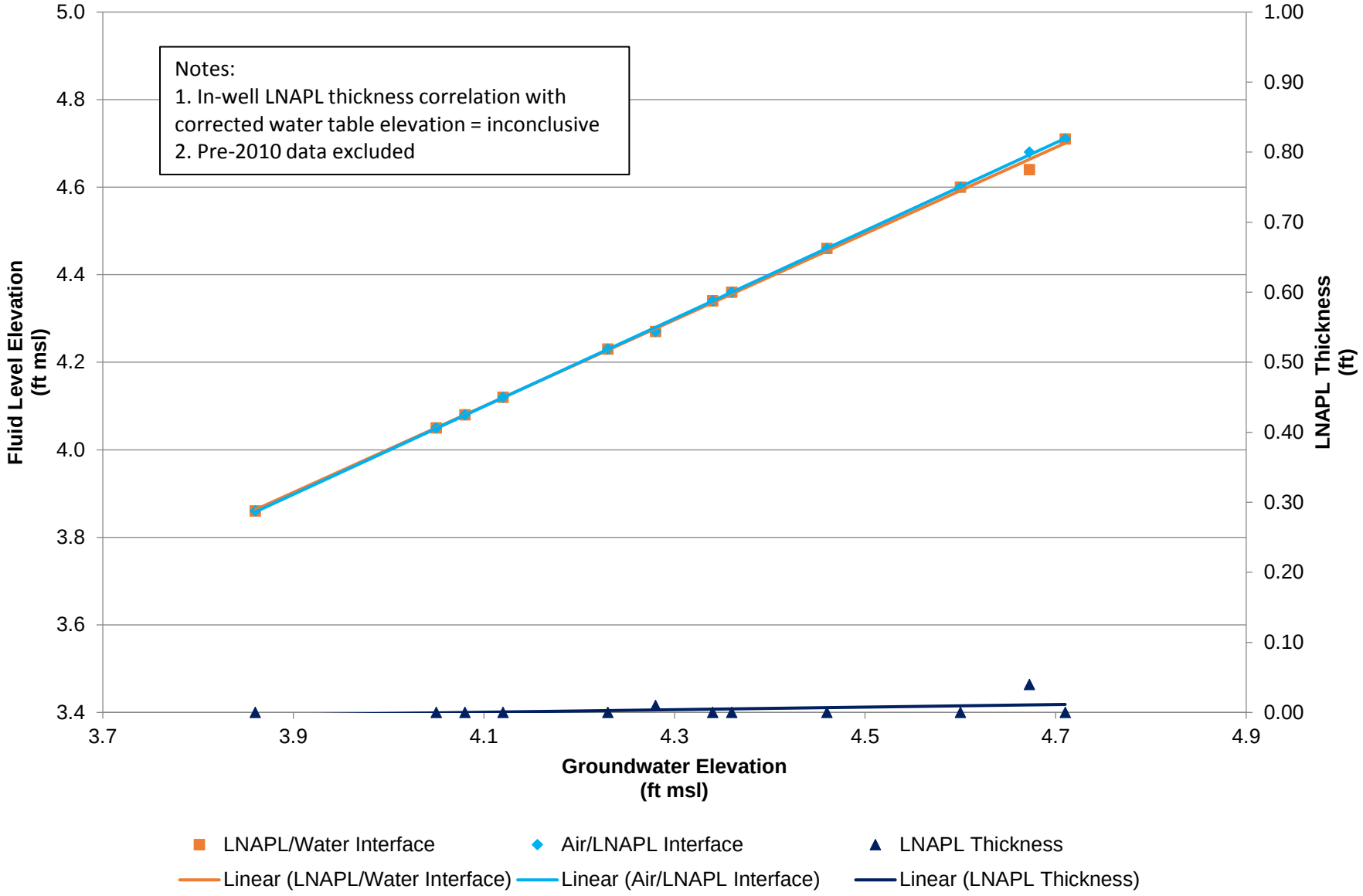
URS-3: Diagnostic Gauge Plot
Philadelphia Refinery Operations

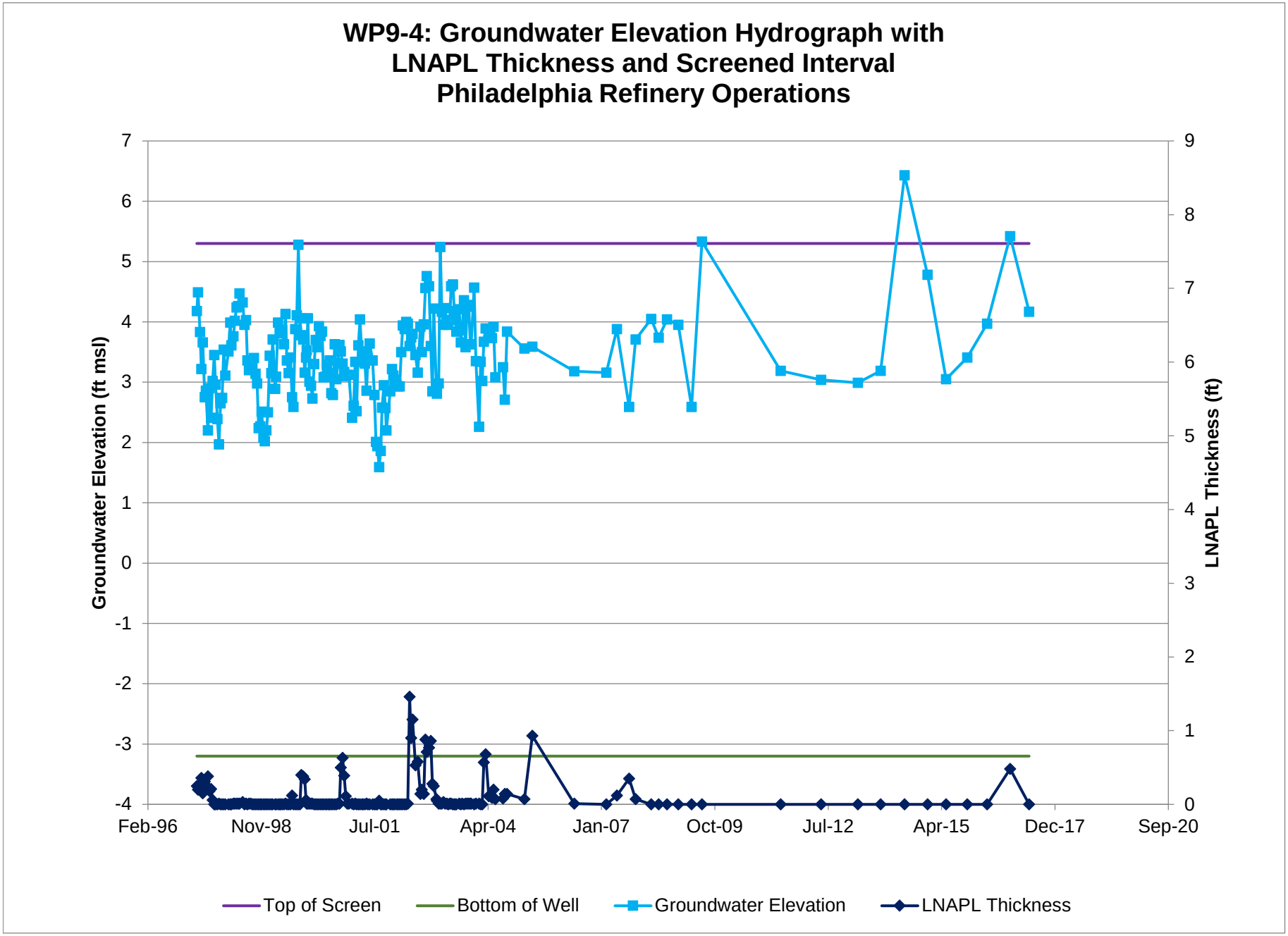



WP9-2: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
9
8
7
6
5
4
3
2
1
0
Feb-96
Jun-97
Nov-98
Mar-00
Jul-01
Dec-02
Apr-04
Sep-05
Jan-07
Jun-08
Oct-09
Bottom of Well
Groundwater Elevation
LNAPL Thickness

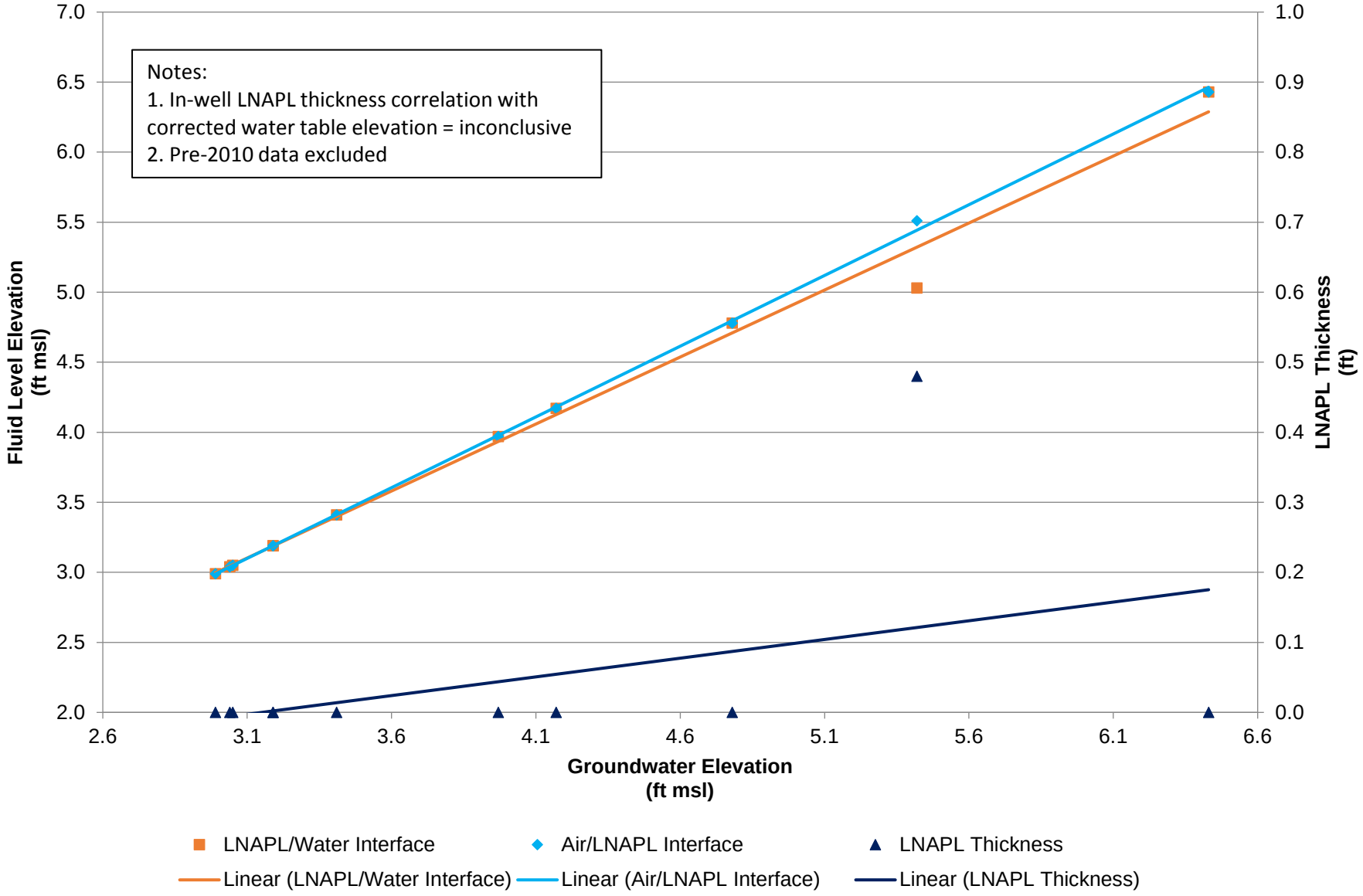

WP9-3: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
9
8
7
6
5
4
3
2
1
0
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Bottom of Well
Groundwater Elevation
LNAPL Thickness

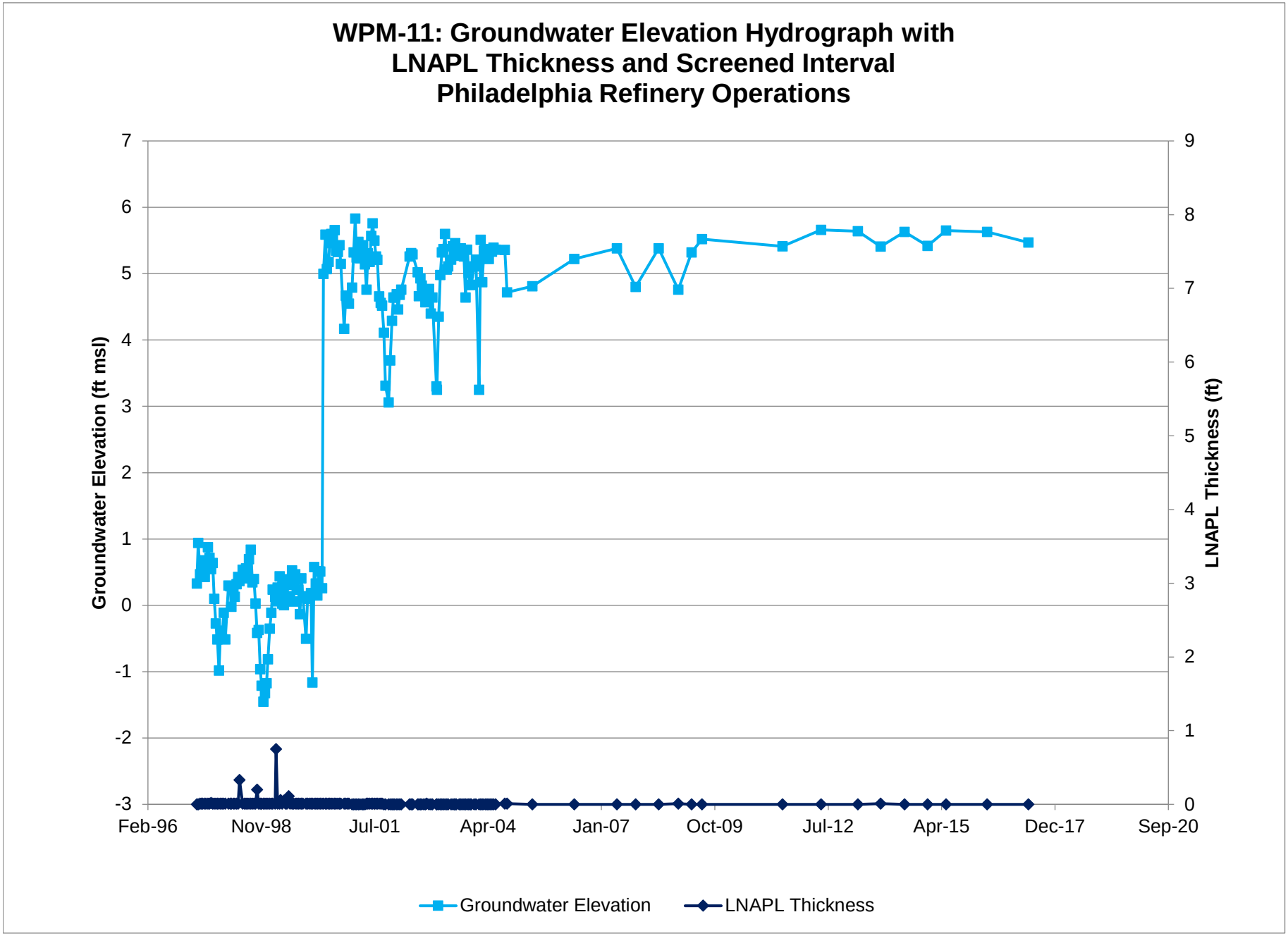
WP9-3: Diagnostic Gauge Plot
Philadelphia Refinery Operations



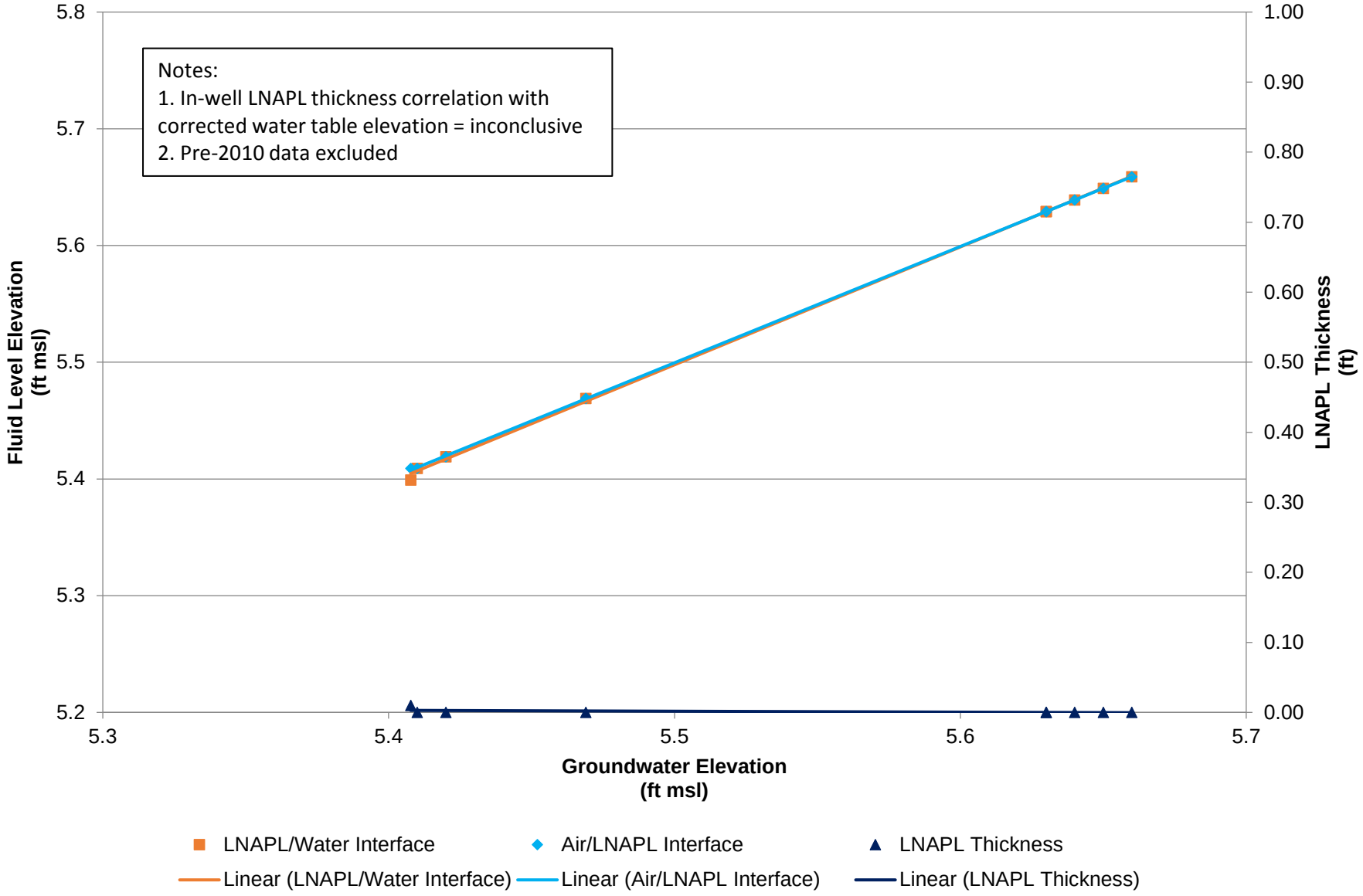

WP9-4: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
0
-1
-2
-3
-4
9
8
7
6
5
4
3
2
1
0
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Top of Screen
Bottom of Well
Groundwater Elevation
LNAPL Thickness

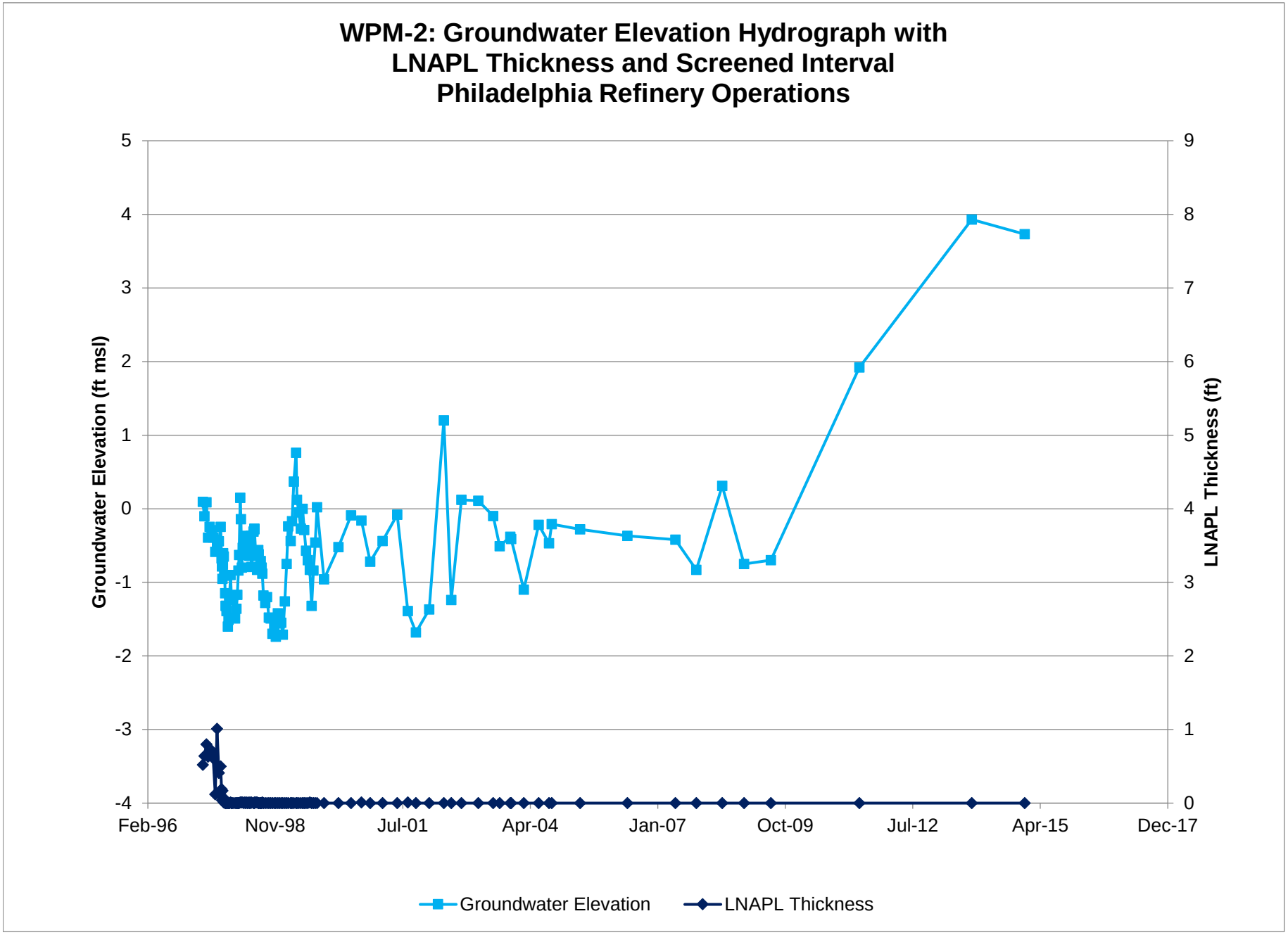
WP9-4: Diagnostic Gauge Plot
Philadelphia Refinery Operations

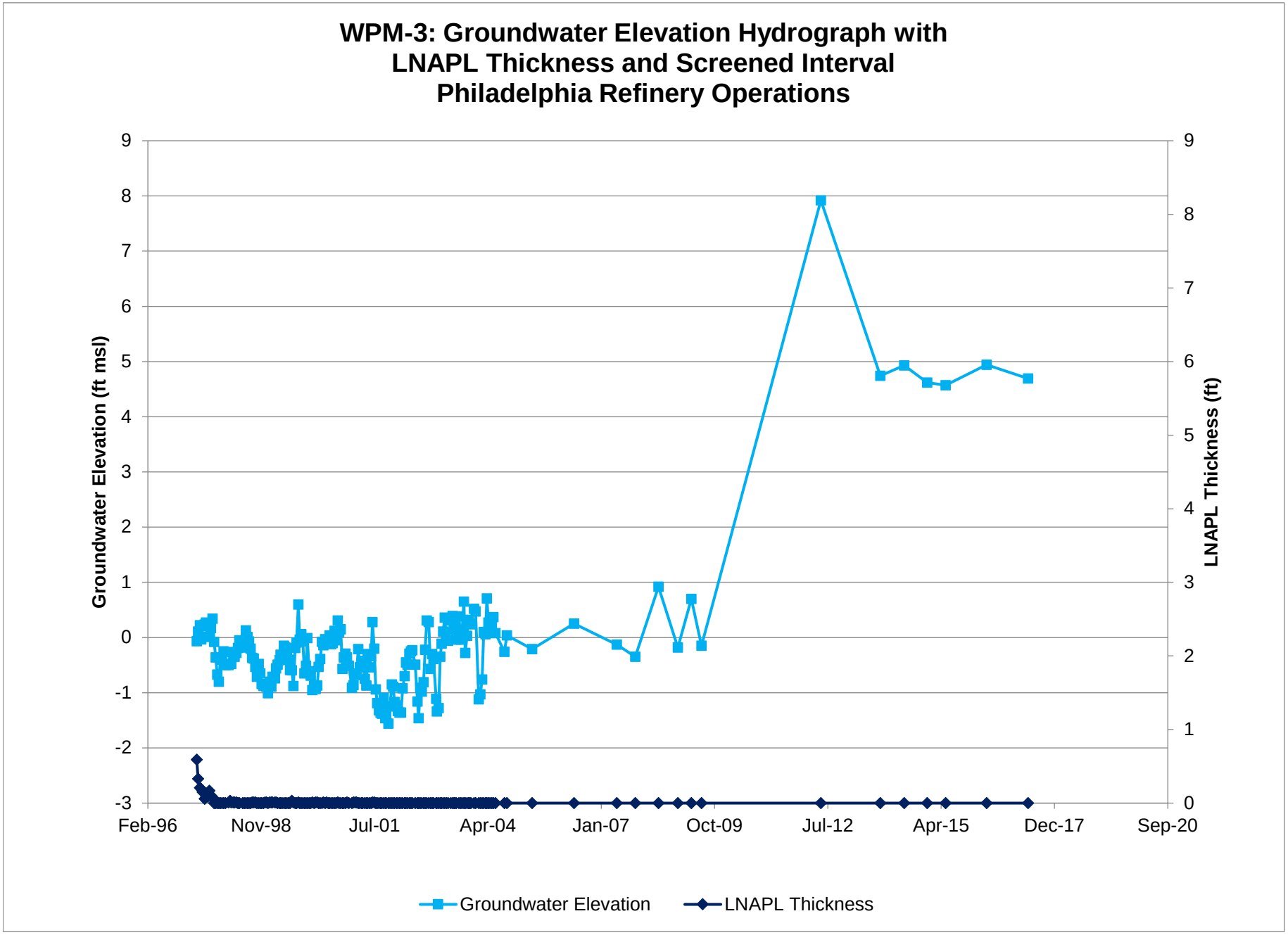


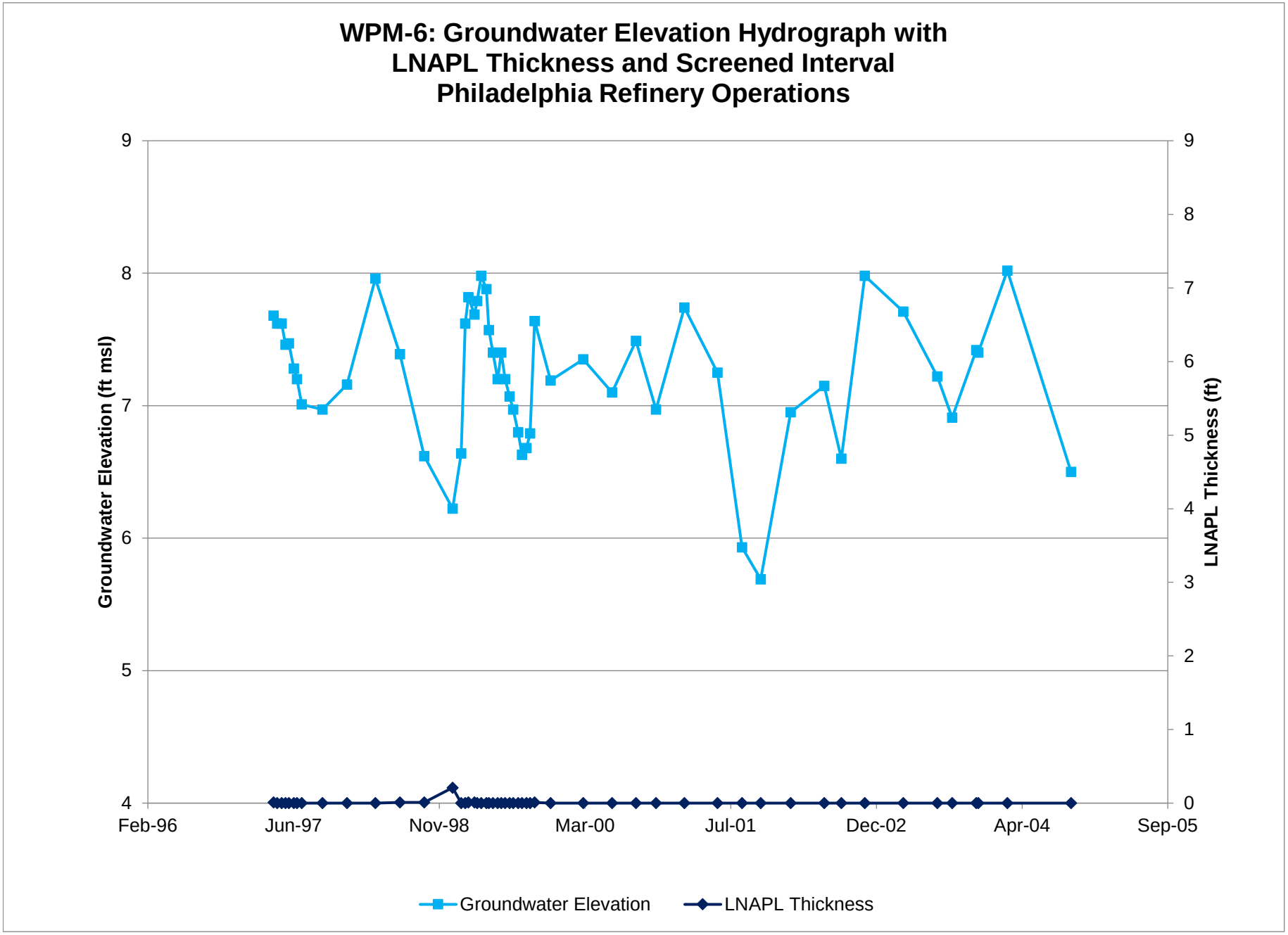

WPM-11: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
7
6
5
4
3
2
1
0
-1
-2
-3
9
8
7
6
5
4
3
2
1
0
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Groundwater Elevation
LNAPL Thickness

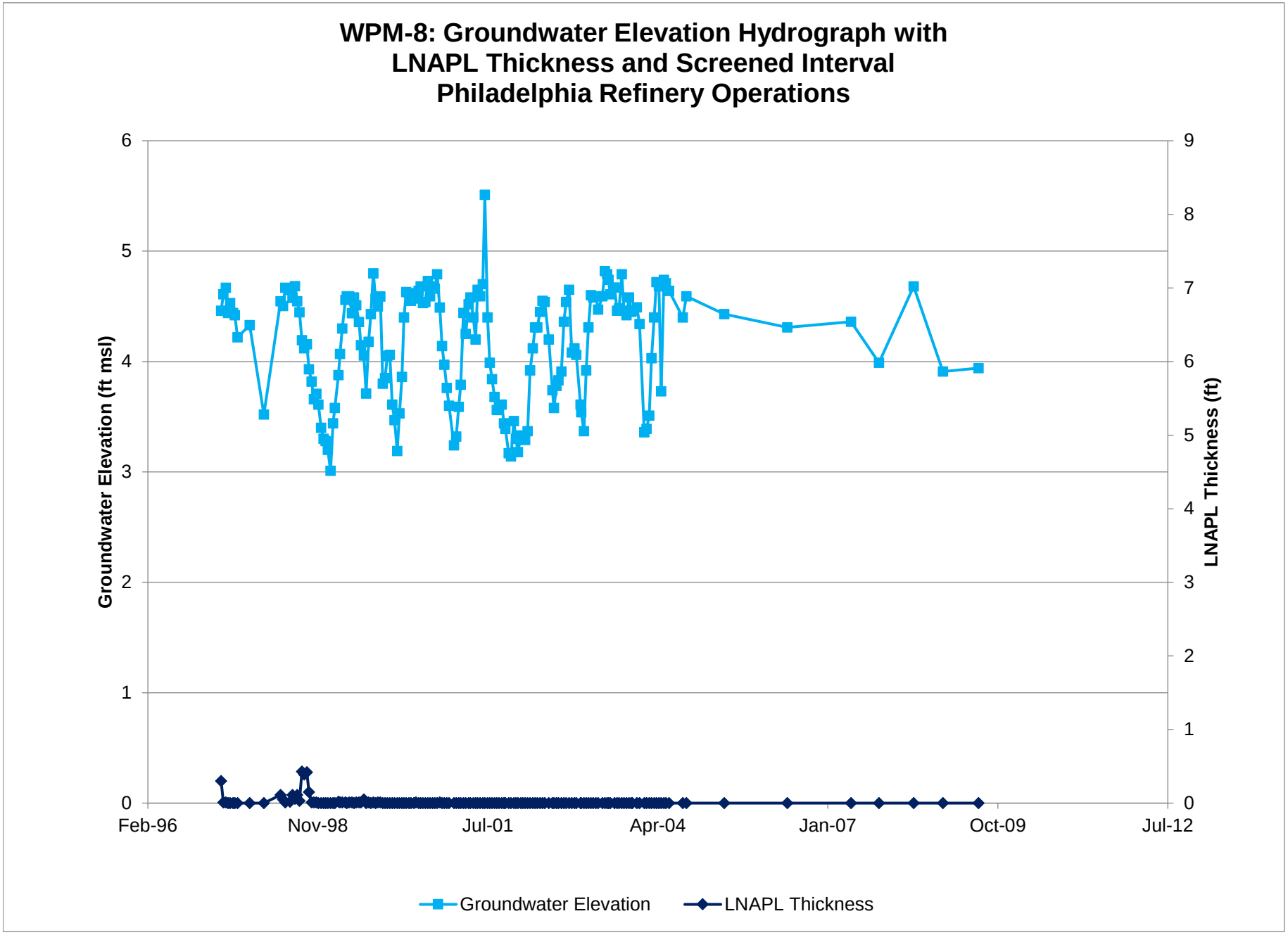
WPM-11: Diagnostic Gauge Plot
Philadelphia Refinery Operations

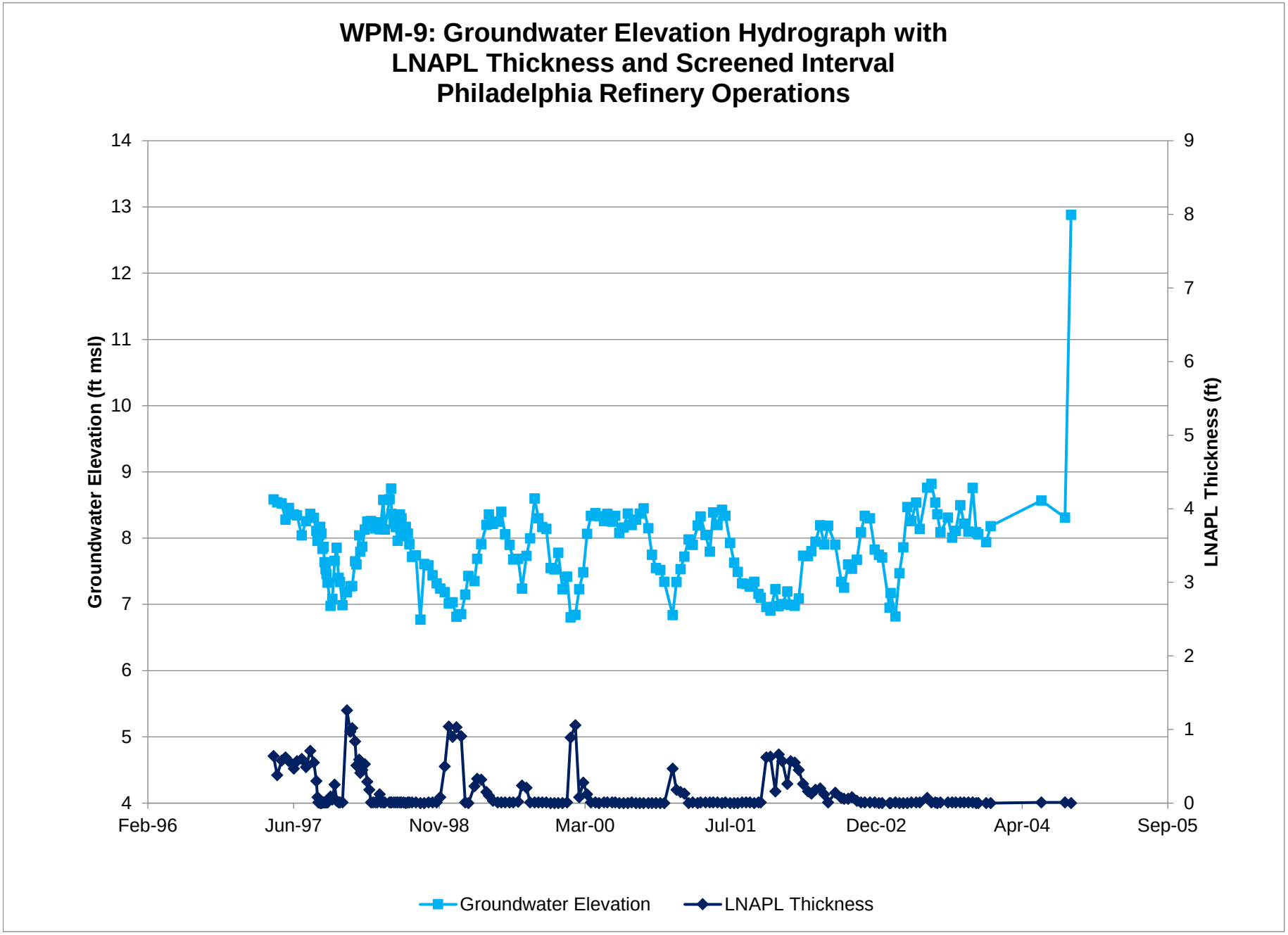



WPM-2: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
5
4
3
2
1
0
-1
-2
-3
-4
9
8
7
6
5
4
3
2
1
0
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Groundwater Elevation
LNAPL Thickness


WPM-3: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Apr-15
Dec-17
Sep-20
Groundwater Elevation
LNAPL Thickness


WPM-6: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
9
8
7
6
5
4
9
8
7
6
5
4
3
2
1
0
Feb-96
Jun-97
Nov-98
Mar-00
Jul-01
Dec-02
Apr-04
Sep-05
Groundwater Elevation
LNAPL Thickness


WPM-8: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
6
5
4
3
2
1
0
9
8
7
6
5
4
3
2
1
0
Feb-96
Nov-98
Jul-01
Apr-04
Jan-07
Oct-09
Jul-12
Groundwater Elevation
LNAPL Thickness


WPM-9: Groundwater Elevation Hydrograph with
LNAPL Thickness and Screened Interval
Philadelphia Refinery Operations
Groundwater Elevation (ft msl)
LNAPL Thickness (ft)
14
13
12
11
10
9
8
7
6
5
4
9
8
7
6
5
4
3
2
1
0
Feb-96
Jun-97
Nov-98
Mar-00
Jul-01
Dec-02
Apr-04
Sep-05
Groundwater Elevation
LNAPL Thickness

Appendix F.2
LNAPL Sample Data Packages

CHAIN OF CUSTODY

Client Information			Facility Information		Analytical Information
Name: Langan Engineering			Project Name: Sunoco - Philadelphia Refinery AOI-6		
Address: 2700 Kelly Road Suite 200			Location: Philadelphia Refinery		
City: Warrington	State: PA	Zip: 18976	Project No.		
Send Report to: Jason Hanna					
Phone #: (215) 491-6500			FAX #: (215) 491-6501		

Field ID / Point of Collection	Collection: Date	Collection: Time	Collection: Sampled By	Matrix	# of bottles	Preservation: HCL	NaOH	HNO3	H2So4	Na2S2O3	None	Fingerprint Analysis
LNAPL - B150 - 041206	4/12/2006	1155	MBS		1						x	X
LNAPL - B47 - 041206	4/12/2006	1220	MBS		1						x	X

Turnaround Information

- [x] Standard — Approved By:
- [ ] 14 Days
- [ ] 7 Days
- [ ] Other

Data Deliverable Information

- [ ] NJ Reduced
- [ ] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] State Forms

Comments / Remarks

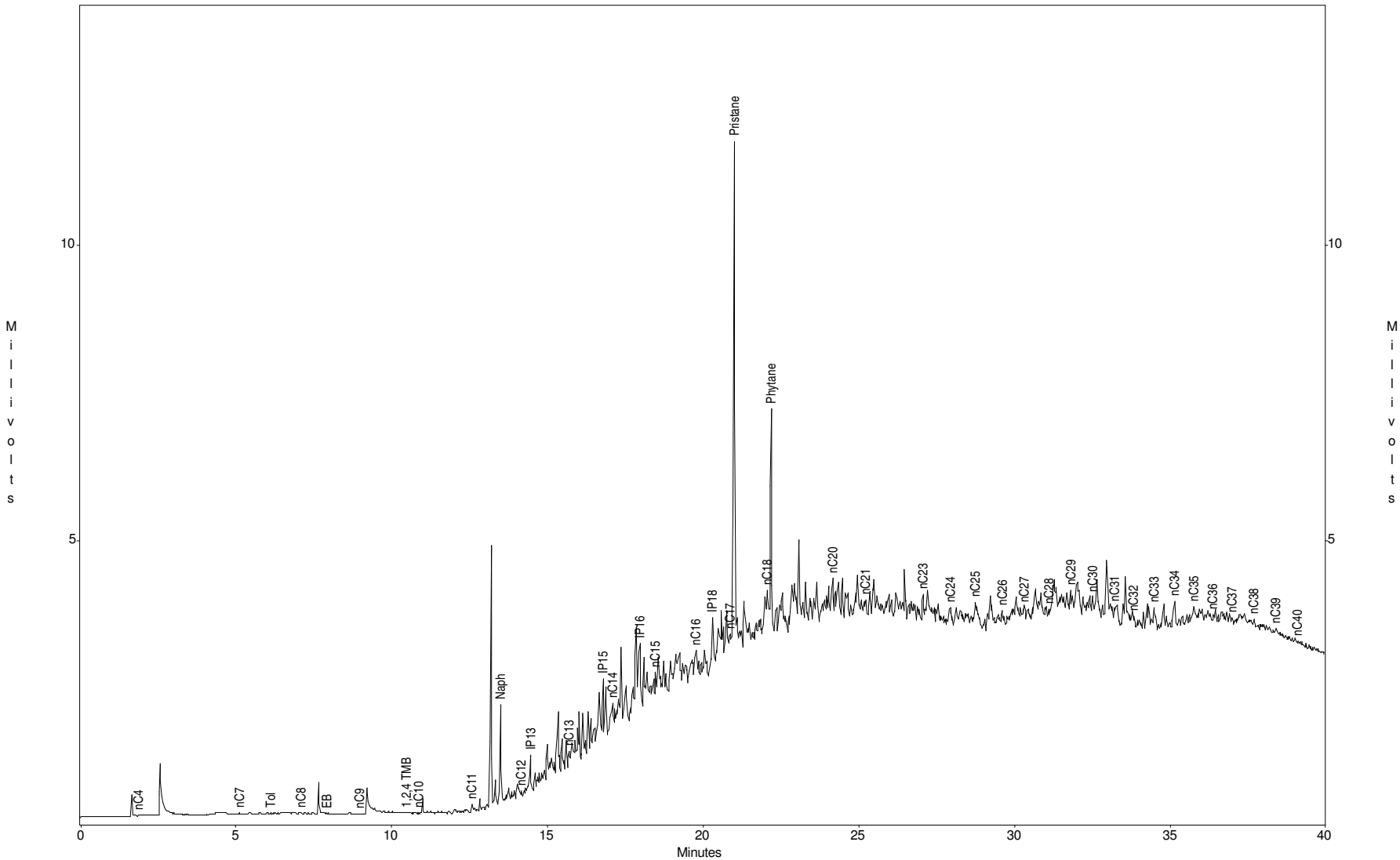
Sample Custody must be documented below each time samples change possesion, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 M. Bled	4/12/06 1015	1 FedEx Air Bill # 8546 0531 8284		4-13-06/1030	2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by Sampler: 5	Date Time:	Received By: 5	Seal #	Preserve where applicable ☐	On Ice ☐ Temperature

Torkelson Geochemistry, Inc.

Sunoco - Philadelphia Refinery AOI-6
Sample ID : B47 - 041206
Acquired : Apr 14, 2006 13:14:13

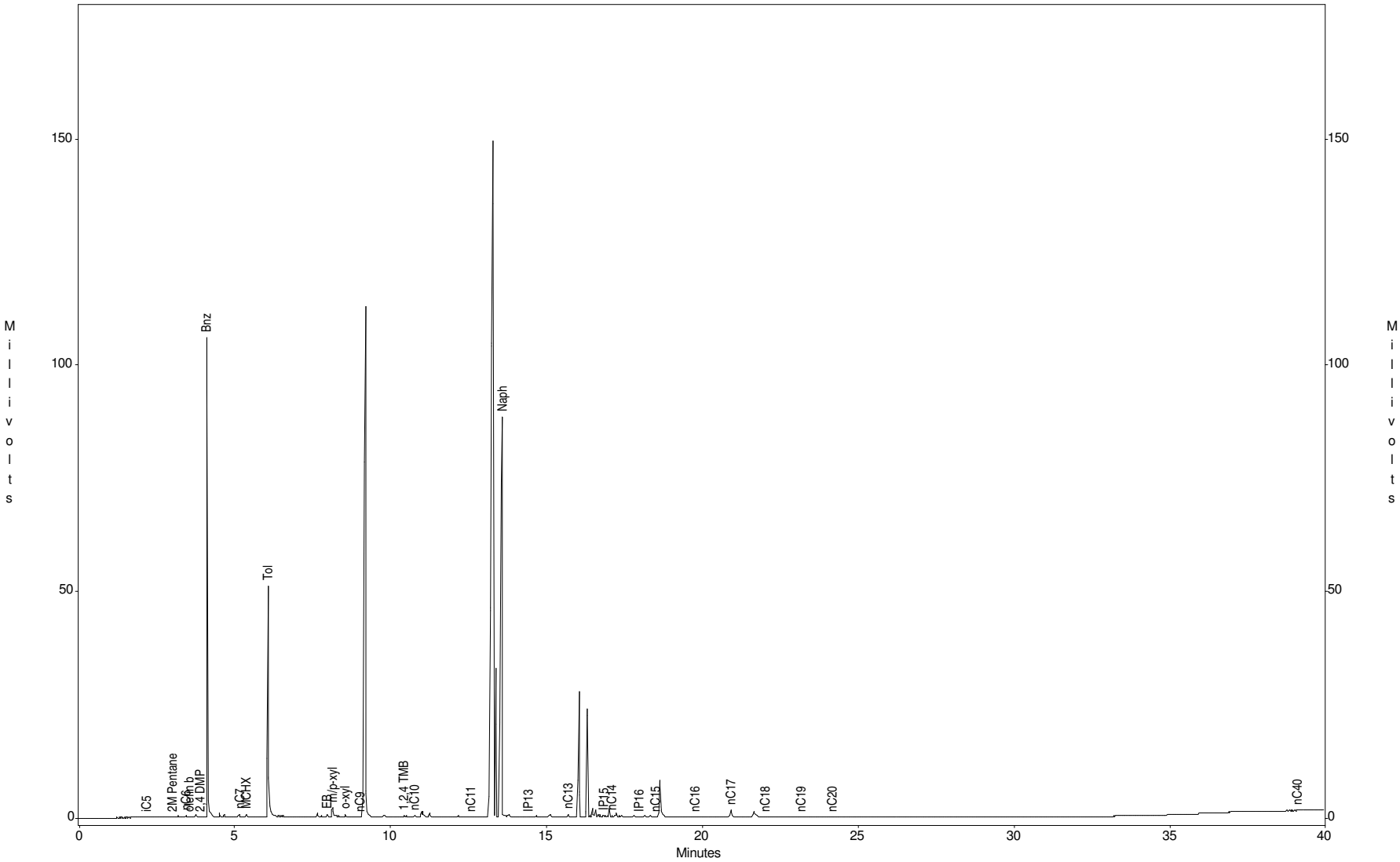
c:\ezchrom\chrom\06045\b47 -- Channel A



Torkelson Geochemistry, Inc.

Sunoco - Philadelphia Refinery AOI-6
Sample ID : B150 - 041206
Acquired : Apr 14, 2006 12:23:26

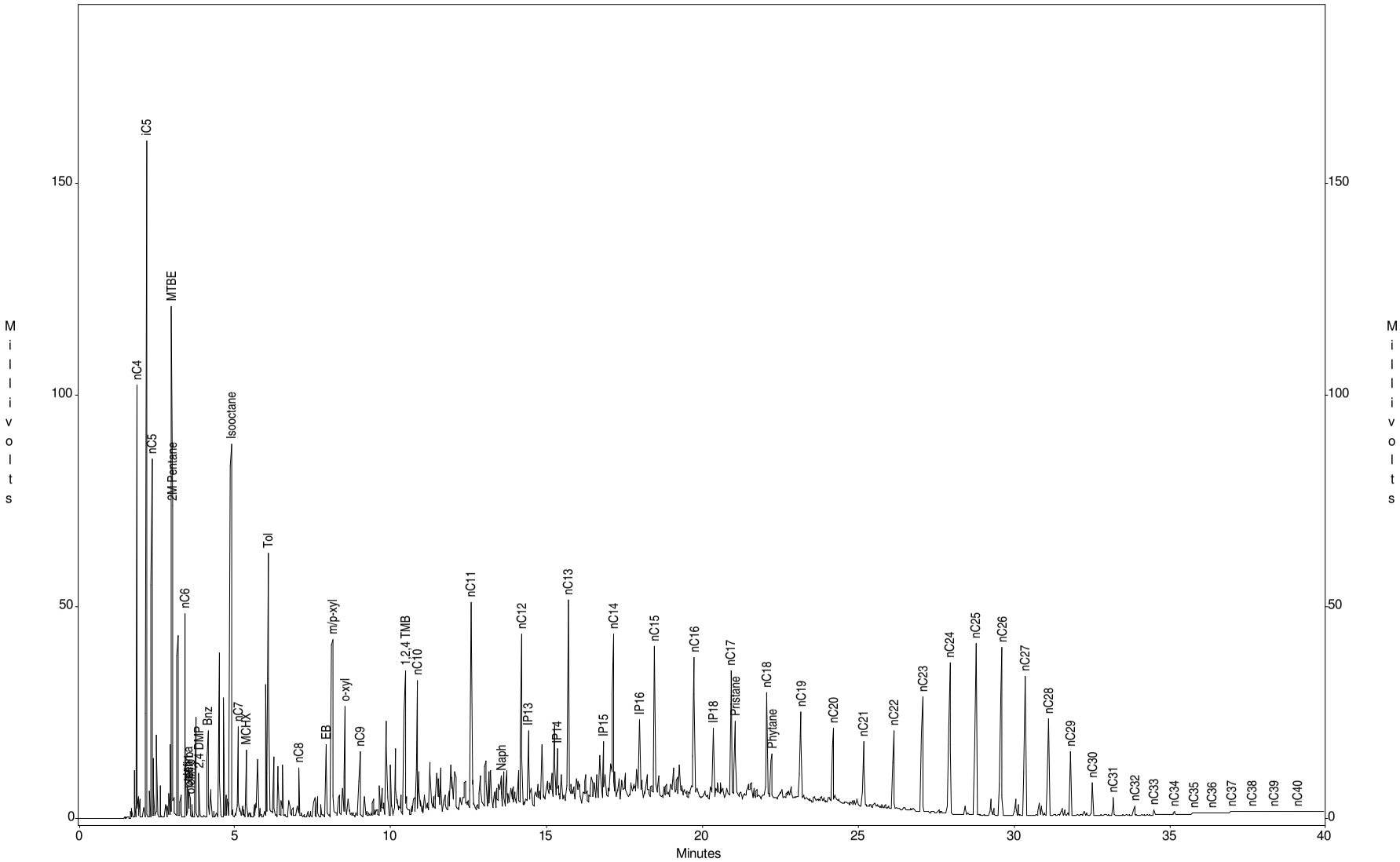
c:\ezchrom\chrom\06045\b150.2 -- Channel A



Torkelson Geochemistry, Inc.

Sunoco - Philadelphia Refinery AOI-6
Sample ID : Gas/Dies/Wax std
Acquired : Apr 14, 2006 10:41:11

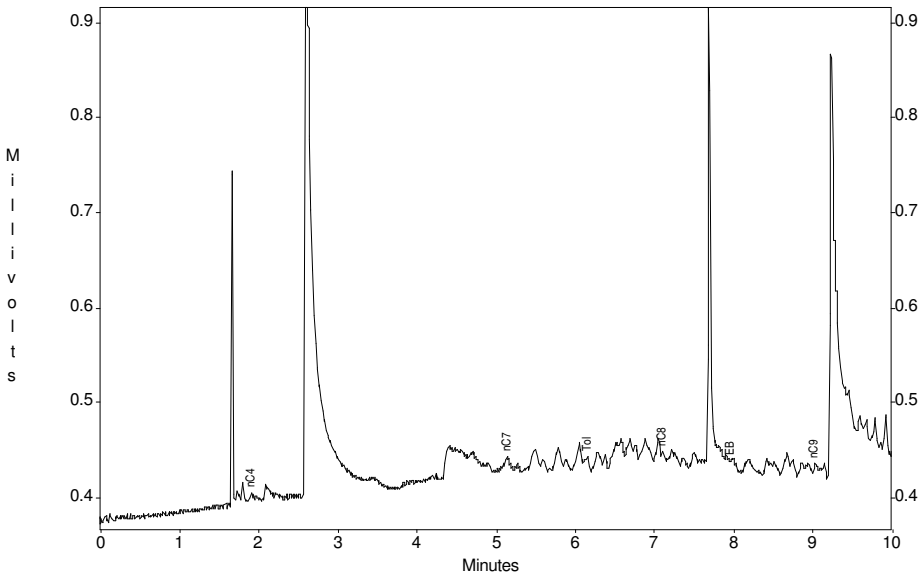
c:\ezchrom\chrom\06045\gadiwax2 -- Channel A



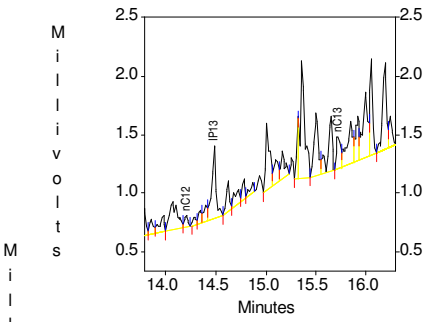
Torkelson Geochemistry, Inc.

Sunoco - Philadelphia Refinery AOI-6
Sample ID : B47 - 041206
Acquired : Apr 14, 2006 13:14:13

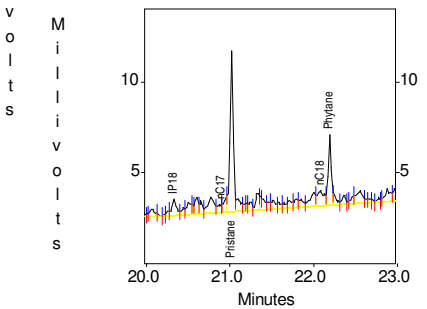
c:\ezchrom\chrom\06045\b47 -- Channel A



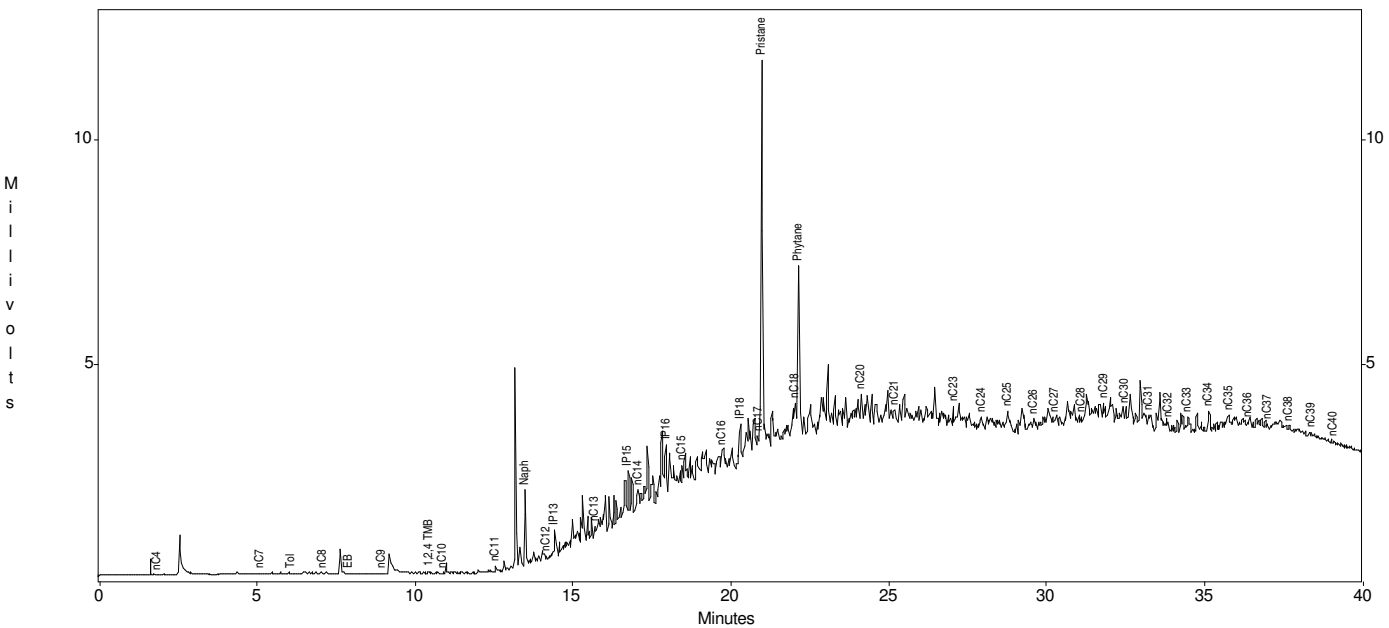
c:\ezchrom\chrom\06045\b47 -- Channel A



c:\ezchrom\chrom\06045\b47 -- Channel A



c:\ezchrom\chrom\06045\b47 -- Channel A



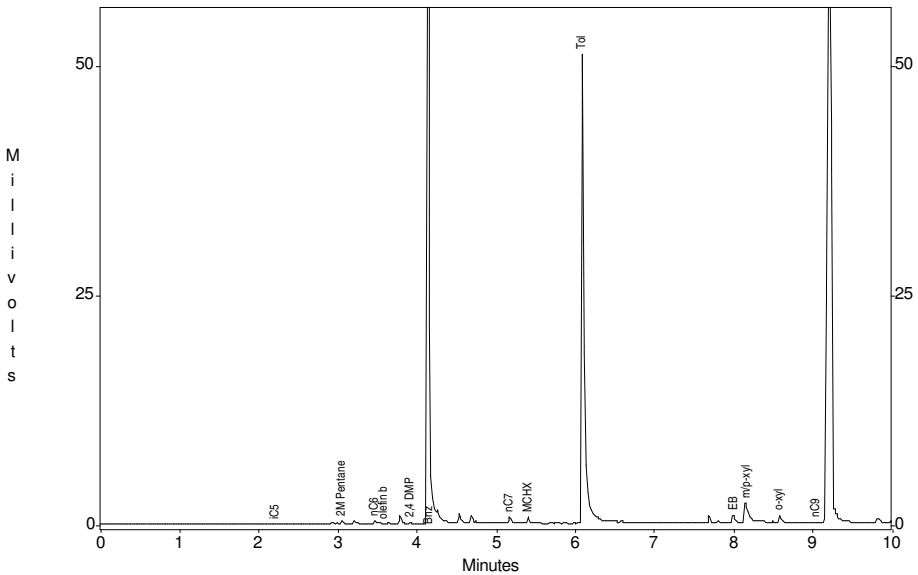
Channel A Results

Peak	Area	Height
nC4	19	8
iC5	0	0
nC5	0	0
MTBE	0	0
2M Pentane	0	0
nC6	0	0
olefin a	0	0
olefin b	0	0
olefin c	0	0
2,4 DMP	0	0
Bnz	0	0
Isooctane	0	0
nC7	53	13
MCHX	0	0
Tol	56	17
nC8	27	13
EB	51	12
m/p-xyl	0	0
o-xyl	0	0
nC9	41	11
1,2,4 TMB	177	29
nC10	37	18
nC11	325	129
Naph	3762	1682
nC12	220	98
IP13	1770	613
IP14	0	0
nC13	788	271
IP15	2198	1080
nC14	1564	551
IP16	6303	1235
nC15	1657	567
nC16	229	151
IP18	3679	940
nC17	565	489
Pristane	22065	8778
nC18	4773	888
Phytane	10286	3918
nC19	0	0
nC20	2913	712
nC21	1271	303
nC22	0	0
nC23	1438	436
nC24	1258	276
nC25	3281	398
nC26	715	225
nC27	496	115
nC28	180	104
nC29	685	324
nC30	686	237
nC31	194	90
nC32	286	109
nC33	500	190
nC34	577	224
nC35	246	102
nC36	73	79
nC37	34	35
nC38	248	89
nC39	294	79
nC40	81	53

Torkelson Geochemistry, Inc.

Sunoco - Philadelphia Refinery AOI-6
Sample ID : B150 - 041206
Acquired : Apr 14, 2006 12:23:26

c:\ezchrom\chrom\06045\b150.2 -- Channel A



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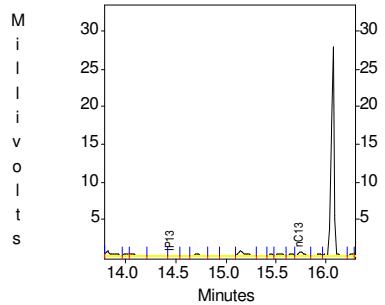
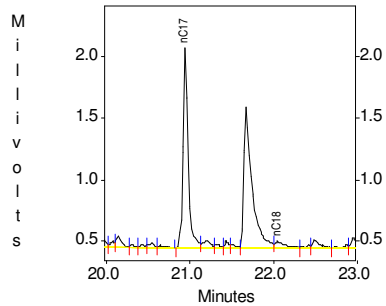
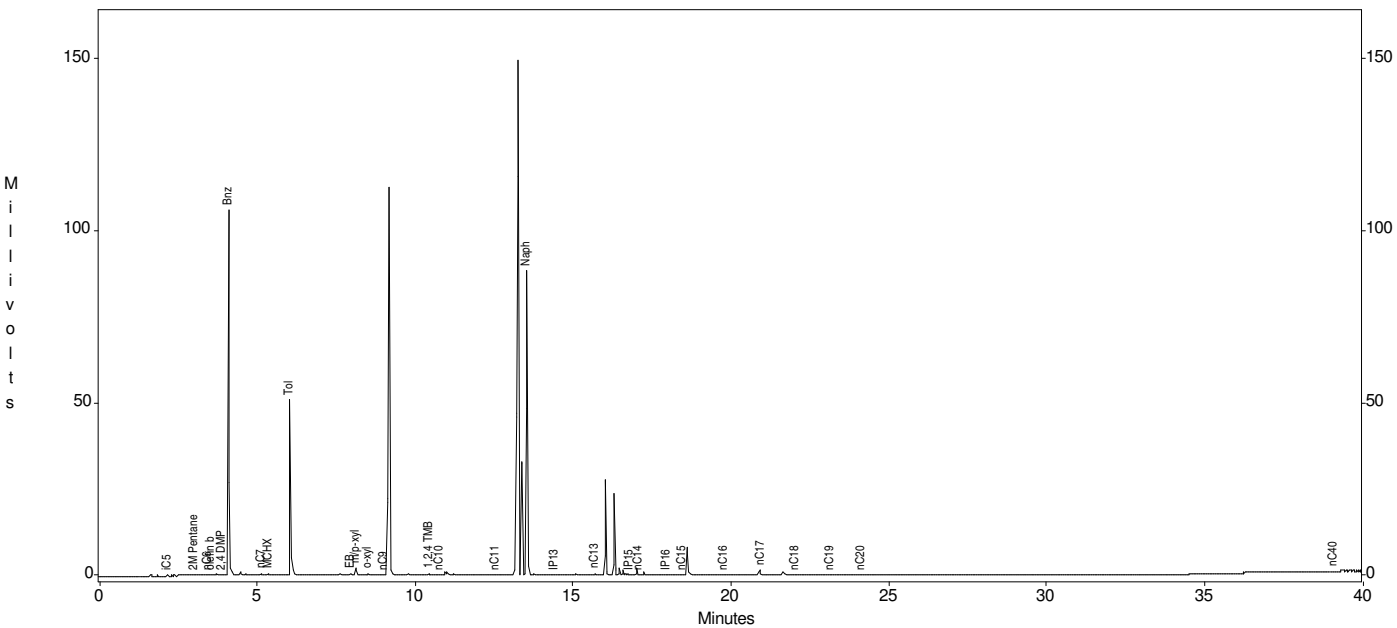


c:\ezchrom\chrom\06045\b150.2 -- Channel A



c:\ezchrom\chrom\06045\b150.2 -- Channel A



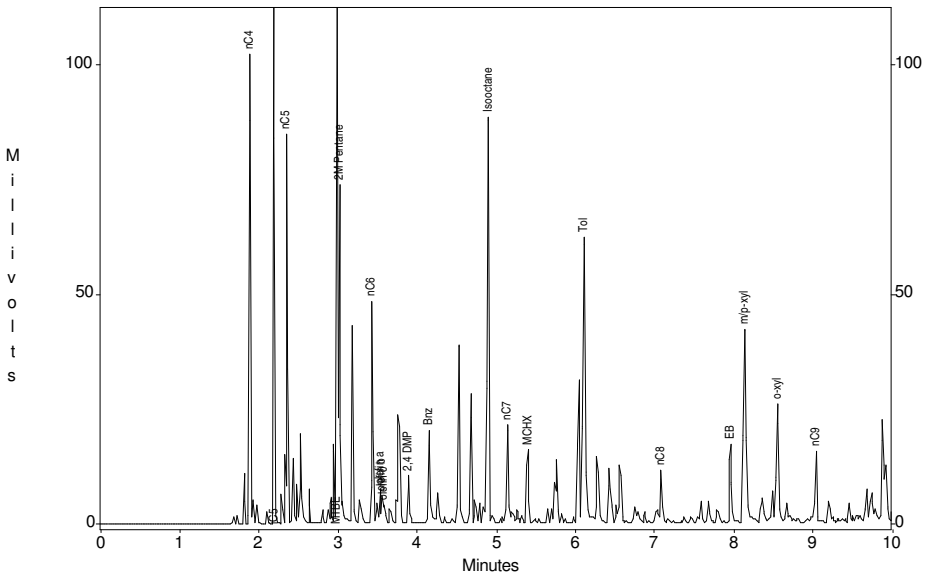
Channel A Results

Peak	Area	Height
nC4	0	0
iC5	20	16
nC5	0	0
MTBE	0	0
2M Pentane	563	283
nC6	841	405
olefin a	0	0
olefin b	67	32
olefin c	0	0
2,4 DMP	193	90
Bnz	160216	106124
Isooctane	0	0
nC7	1845	642
MCHX	1281	623
Tol	103958	51163
nC8	0	0
EB	2805	854
m/p-xyl	8518	2204
o-xyl	2346	857
nC9	486	118
1,2,4 TMB	1217	506
nC10	1188	408
nC11	445	141
Naph	187508	88406
nC12	0	0
IP13	341	94
IP14	0	0
nC13	1792	536
IP15	1178	373
nC14	350	161
IP16	553	142
nC15	213	67
nC16	327	51
IP18	0	0
nC17	6838	1630
Pristane	0	0
nC18	513	54
Phytane	0	0
nC19	443	48
nC20	133	18
nC21	0	0
nC22	0	0
nC23	0	0
nC24	0	0
nC25	0	0
nC26	0	0
nC27	0	0
nC28	0	0
nC29	0	0
nC30	0	0
nC31	0	0
nC32	0	0
nC33	0	0
nC34	0	0
nC35	0	0
nC36	0	0
nC37	0	0
nC38	0	0
nC39	0	0
nC40	61	11

Torkelson Geochemistry, Inc.

Sunoco - Philadelphia Refinery AOI-6
Sample ID : Gas/Dies/Wax std
Acquired : Apr 14, 2006 10:41:11

c:\ezchrom\chrom\06045\gadiwax2 -- Channel A



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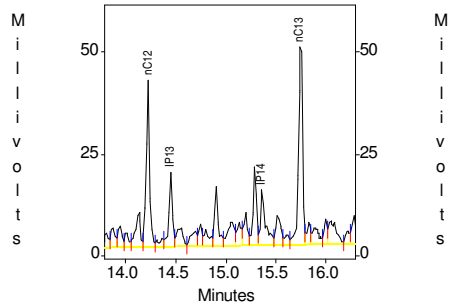

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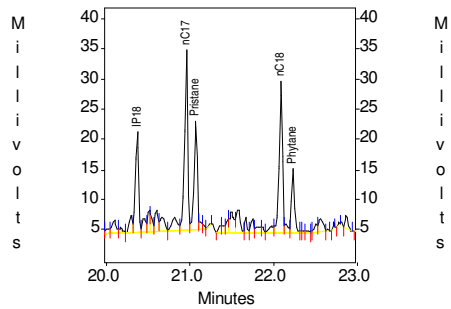

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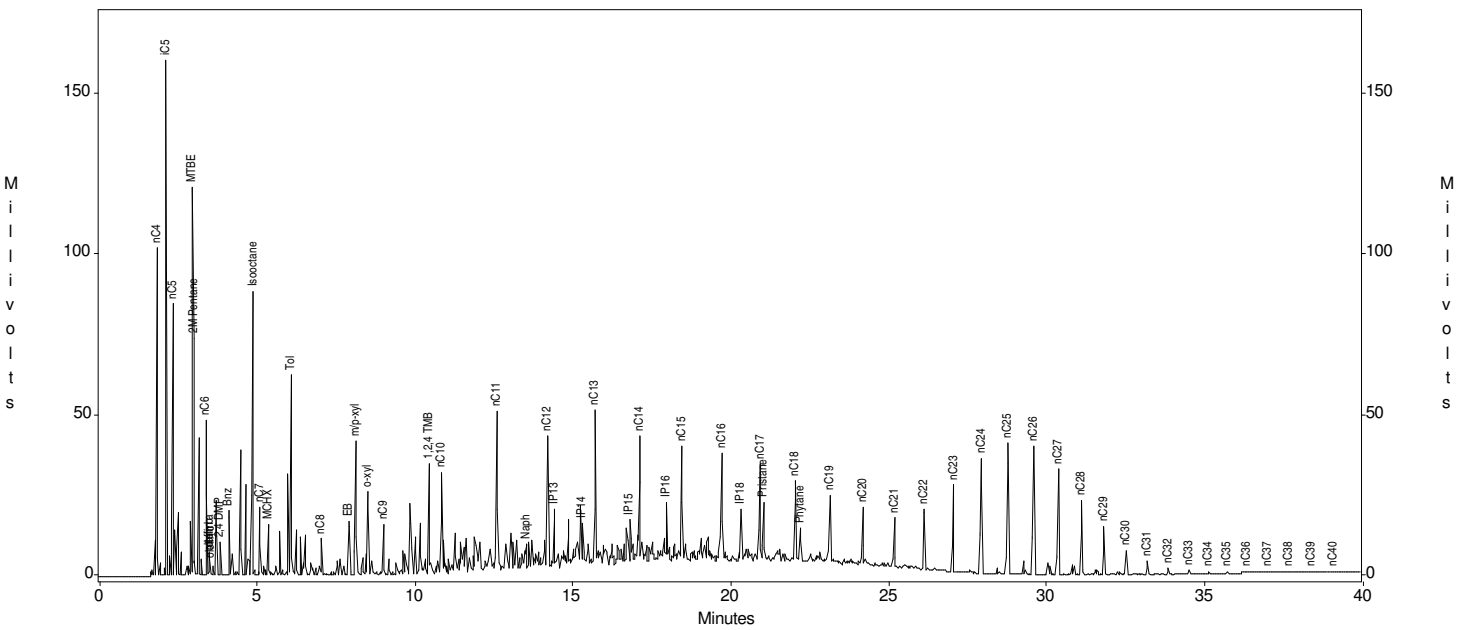

Channel A Results

Peak	Area	Height
nC4	84561	102174
iC5	136768	160088
nC5	79261	84657
MTBE	121512	120527
2M Pentane	80340	73282
nC6	53020	48034
olefin a	8755	7205
olefin b	7290	5882
olefin c	6197	4074
2,4 DMP	12258	10284
Bnz	33741	20370
Isooctane	146709	88291
nC7	33787	21290
MCHX	22936	15953
Tol	124172	62308
nC8	18010	11671
EB	32939	17060
m/p-xyl	107183	41949
o-xyl	46334	25977
nC9	26180	15564
1,2,4 TMB	70113	34041
nC10	57774	31481
nC11	117549	49268
Naph	19267	7884
nC12	101487	41319
IP13	42328	18252
IP14	45498	13651
nC13	131064	48784
IP15	30259	14626
nC14	107287	40013
IP16	48255	19387
nC15	98292	36550
nC16	88751	33660
IP18	39089	16488
nC17	74901	29758
Pristane	44127	17721
nC18	64118	24944
Phytane	26327	10441
nC19	58683	20646
nC20	41787	17745
nC21	35376	15292
nC22	44052	18715
nC23	70927	27082
nC24	109064	35720
nC25	129316	40528
nC26	133116	39579
nC27	103011	33121
nC28	66030	22904
nC29	36616	15210
nC30	17609	7535
nC31	10246	4239
nC32	4790	2112
nC33	2587	1133
nC34	1465	595
nC35	843	324
nC36	538	164
nC37	358	86
nC38	642	45
nC39	353	33
nC40	94	21

CHAIN OF CUSTODY

Client Information		Facility Information	
Name: Langan Engineering		Project Name: Sunoco - Philadelphia Refinery AOI-6	
Address: 2700 Kelly Road Suite 200		Location: Philadelphia Refinery	
City: Warrington	State: PA	Zip: 18976	Project No.
Send Report to: Jason Hanna			
Phone #: (215) 491-6500		FAX #: (215) 491-6501	

Field ID / Point of Collection	Collection: Date	Collection: Time	Collection: Sampled By	Matrix	# of bottles	Preservation: HCL	NaOH	HNO3	H2So4	Na2S2O3	None	Fingerprint Analysis			Analytical Information				
LNAPL - J Avenue	6/9/2006	1210	MBS		2						x	X							

Turnaround Information		Data Deliverable Information		Comments / Remarks
[X] Standard	Approved By:	[ ] NJ Reduced	[ ] Commercial "A"	
[ ] 14 Days		[ ] NJ Full	[ ] Commercial "B"	
[ ] 7 Days		[ ] FULL CLP	[ ] State Forms	
[ ] Other		[ ] Disk Deliverable		
		[ ] Other (Specify)		

Sample Custody must be documented below each time samples change possesion, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 M. Brad [signature]	6/14/06	1 FedEx Air Bill 8546 0511 9365	2 →	6-15-06/1005	2 [signature]
3		3	4		4
5		5	Seal #	Preserve where applicable ☐	On Ice ☐ Temperature

Torkelson Geochemistry, Inc.

Sunoco - Philadelphi Refinery AOI-6
Sample ID : LNAPL-J Avenue
Acquired : Jun 16, 2006 16:24:59

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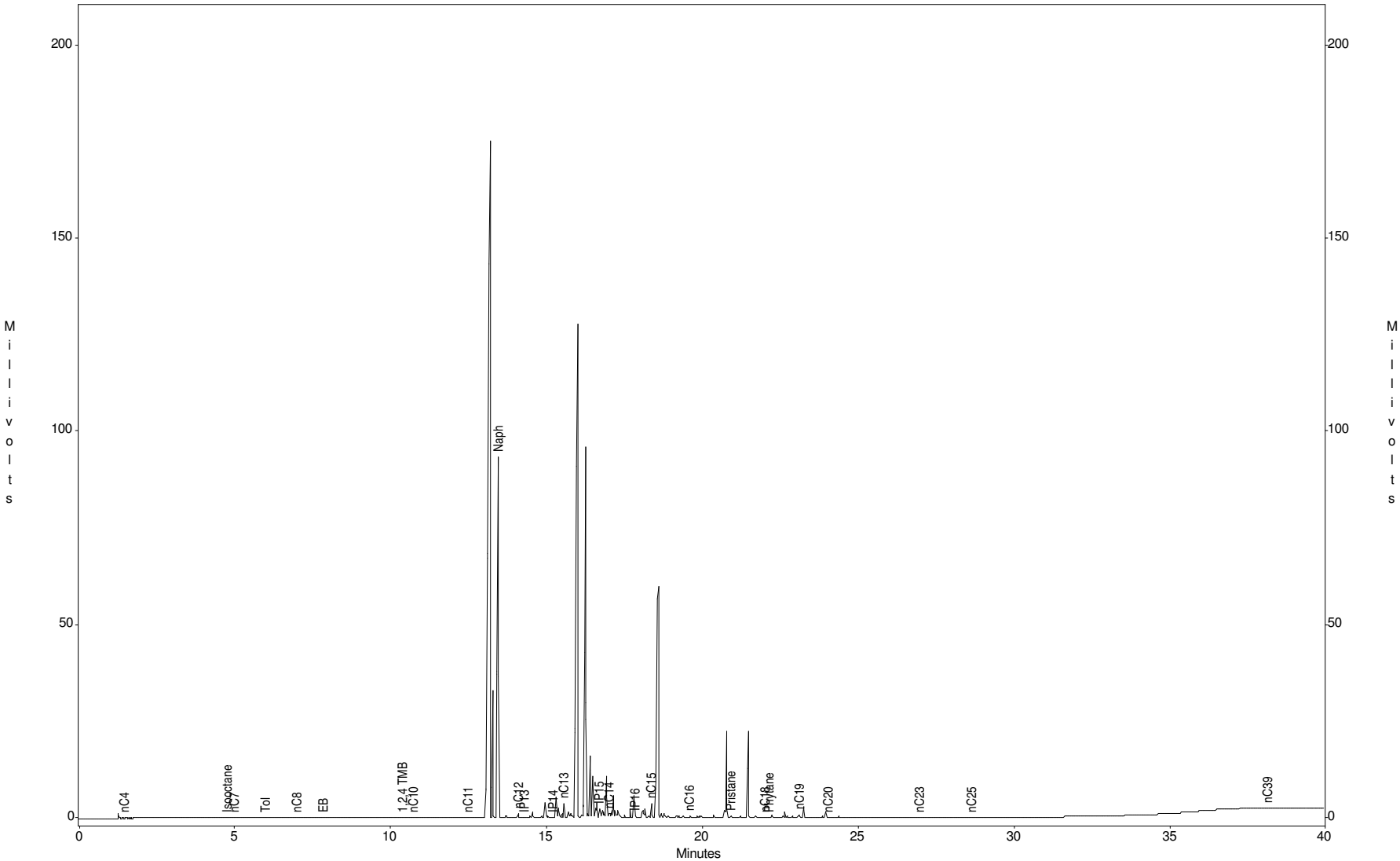

Torkelson Geochemistry, Inc.

Sunoco - Philadelphi Refinery AOI-6
Sample ID : Gas/Dies/Wax std
Acquired : Jun 16, 2006 14:47:45

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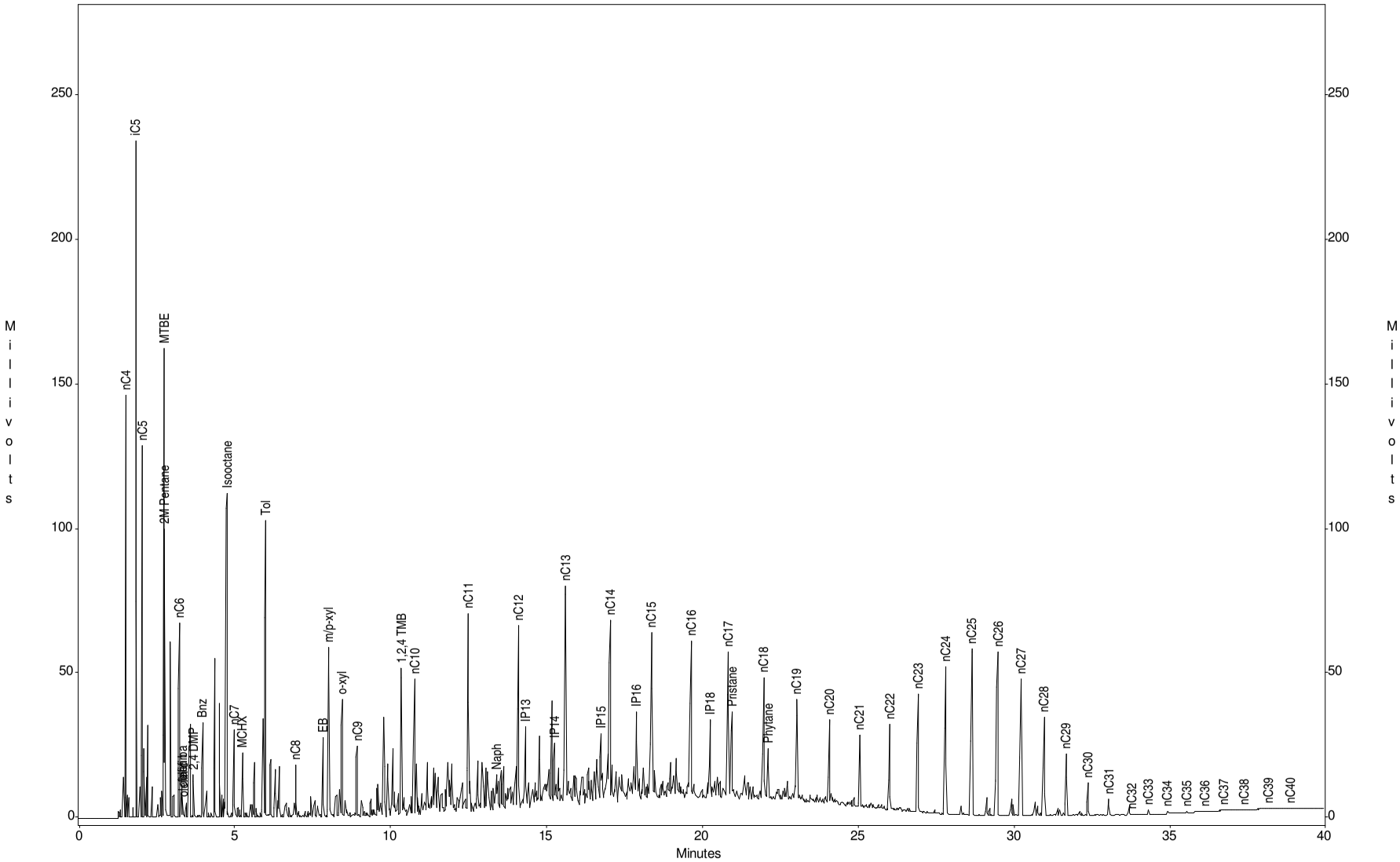
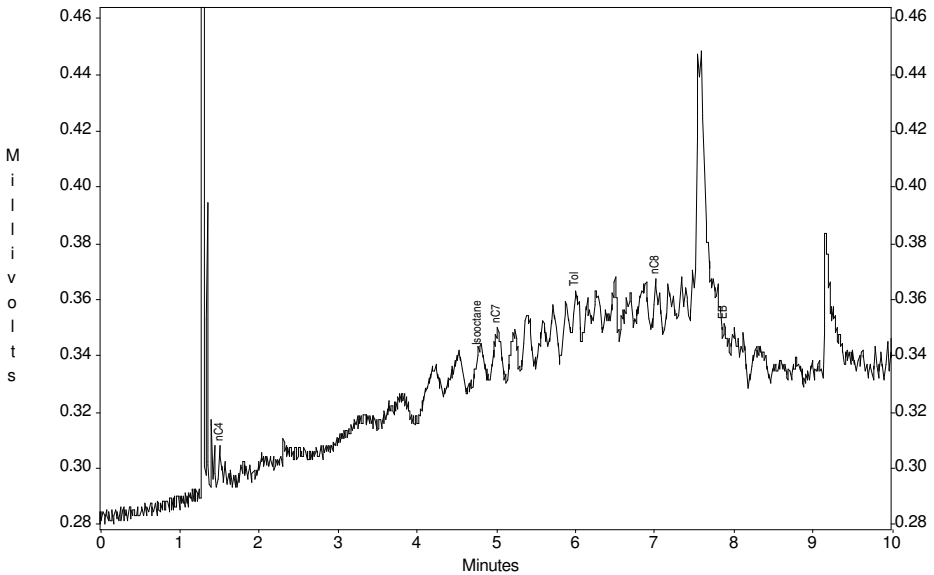


Torkelson Geochemistry, Inc.

Sunoco - Philadelphi Refinery AOI-6
Sample ID : LNAPL-J Avenue
Acquired : Jun 16, 2006 16:24:59

c:\ezchrom\chrom\06075\j-ave.2 -- Channel A



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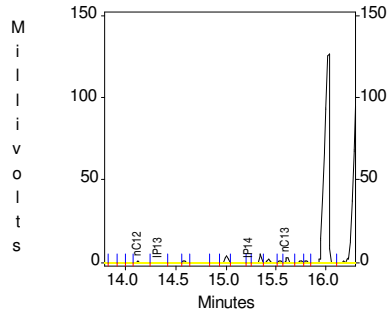

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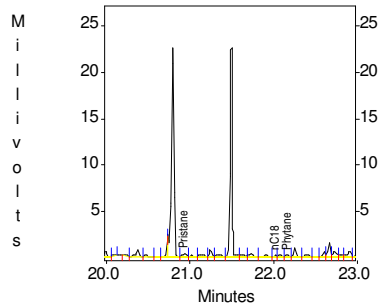

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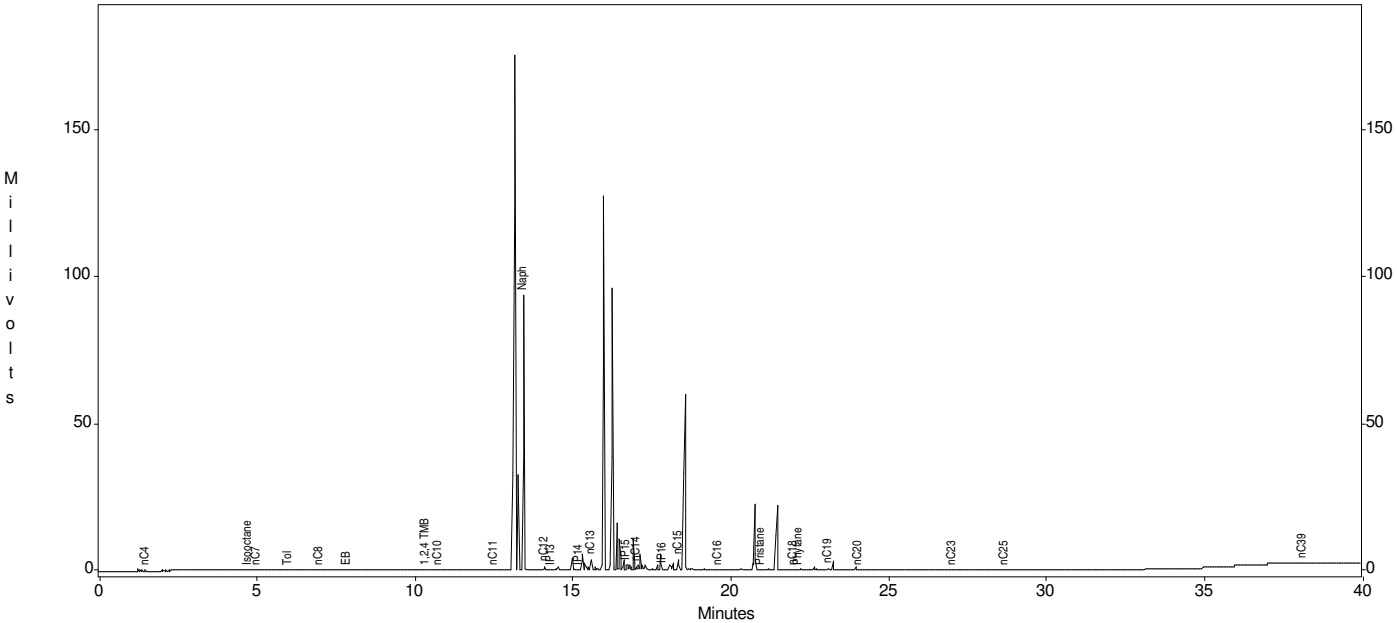


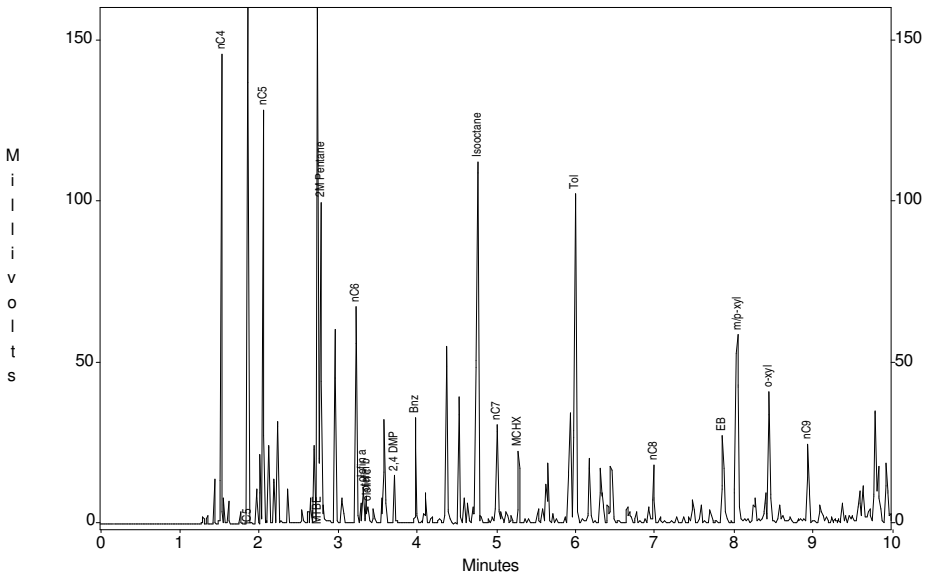
Channel A Results

Peak	Area	Height
nC4	23	15
iC5	0	0
nC5	0	0
MTBE	0	0
2M Pentane	0	0
nC6	0	0
olefin a	0	0
olefin b	0	0
olefin c	0	0
2,4 DMP	0	0
Bnz	0	0
Isooctane	46	8
nC7	106	18
MCHX	0	0
Tol	110	22
nC8	38	17
EB	18	8
m/p-xyl	0	0
o-xyl	0	0
nC9	0	0
1,2,4 TMB	119	24
nC10	231	35
nC11	394	126
Naph	221610	93625
nC12	2639	1262
IP13	367	110
IP14	197	108
nC13	6767	3770
IP15	7066	2091
nC14	2476	1308
IP16	1479	576
nC15	7156	3795
nC16	755	310
IP18	0	0
nC17	0	0
Pristane	1207	420
nC18	184	83
Phytane	394	180
nC19	2182	694
nC20	588	189
nC21	0	0
nC22	0	0
nC23	109	56
nC24	0	0
nC25	28	12
nC26	0	0
nC27	0	0
nC28	0	0
nC29	0	0
nC30	0	0
nC31	0	0
nC32	0	0
nC33	0	0
nC34	0	0
nC35	0	0
nC36	0	0
nC37	0	0
nC38	0	0
nC39	27	15
nC40	0	0

Torkelson Geochemistry, Inc.

Sunoco - Philadelphi Refinery AOI-6
Sample ID : Gas/Dies/Wax std
Acquired : Jun 16, 2006 14:47:45

c:\ezchrom\chrom\06075\gadiwax2 -- Channel A



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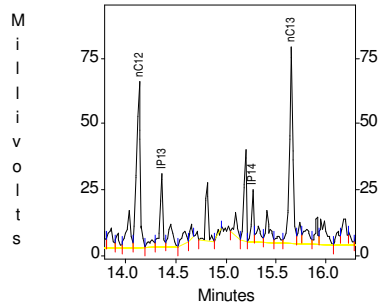

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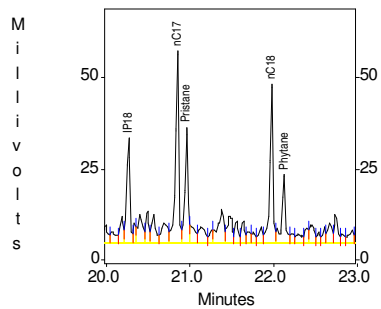

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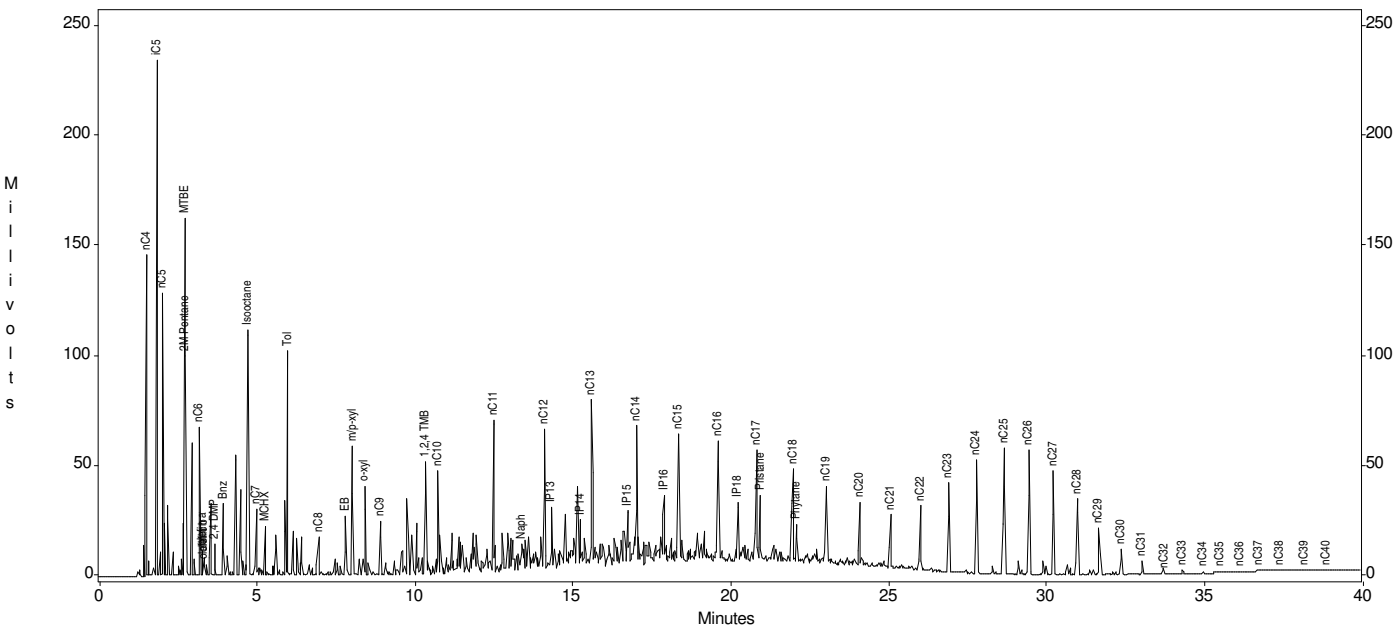

Channel A Results

Peak	Area	Height
nC4	88371	146043
iC5	159578	234318
nC5	93148	128465
MTBE	153284	162193
2M Pentane	94624	99586
nC6	66260	67304
olefin a	11648	11187
olefin b	8877	8578
olefin c	6828	5396
2,4 DMP	15414	14751
Bnz	43704	32699
Isooctane	179549	112012
nC7	39087	30428
MCHX	29101	22333
Tol	166073	102624
nC8	22955	17865
EB	41303	27476
m/p-xyl	146462	58414
o-xyl	63282	40612
nC9	34862	24468
1,2,4 TMB	97586	51102
nC10	79438	46920
nC11	161746	68707
Naph	26912	12104
nC12	146073	63418
IP13	60863	28341
IP14	32472	19921
nC13	180550	74970
IP15	55203	24944
nC14	159843	63744
IP16	77389	31958
nC15	175808	59637
nC16	153384	56327
IP18	70252	29094
nC17	134745	52876
Pristane	83462	31628
nC18	108123	43619
Phytane	58931	18823
nC19	95532	35965
nC20	53488	28061
nC21	50062	24667
nC22	62672	29794
nC23	99772	40754
nC24	150048	51091
nC25	175732	57657
nC26	177197	56544
nC27	134915	47299
nC28	85134	34271
nC29	47484	21434
nC30	22373	11409
nC31	12659	5666
nC32	185	109
nC33	3064	1555
nC34	1695	785
nC35	940	440
nC36	473	200
nC37	469	104
nC38	493	58
nC39	46	24
nC40	15	11

Appendix F.3
API LNAPL Distribution and Recovery Model Input Parameter Selection and Results

Table 1

LNAPL Distribution and Recovery Model (LDRM) Input Selection Summary
AOI 6, PES Facility, Philadelphia, Pennsylvania

LDRM Input Parameter	Selected Value(s)	Source	Rationale for Value Selection
In-well LNAPL thickness	5.08 feet	2017 well gauging data	Maximum in-well LNAPL thickness from available 2017 data (for B-129)
Ground surface elevation	6.33 feet amsl	Site survey data	Value for B-129
Groundwater table elevation	2.19 feet amsl	2017 well gauging data	Corresponds to location/event with maximum in-well thickness value (for B-129)
Water vertical gradient	0	Assumed	Assumed hydraulic conditions approximated vertical equilibrium during the respective well level monitoring events.
LNAPL density	0.87 g/cm^3	LNAPL/water physical property test results	
LNAPL viscosity	5 cP	Literature value	Derived from API Interactive LNAPL Guide
Water surface tension	65 dyne/cm	LDRM default value	
LNAPL surface tension	25 dyne/cm	LDRM default value	
LNAPL/water interfacial tension	25 dyne/cm	LDRM default value	
Soil porosity	0.45	Literature value	Average value from API database for ML soil type
van Genuchten N	2.01	Literature value	Average value from API database for ML soil type
van Genuchten α	0.195 ft^{-1} (3.6 m^{-1})	Literature value	Average value from API database for ML soil type
Relative permeability model	1		Selection indicates the Mualem relative permeability model will be used for the model calculations. The Mualem model is appropriate for fine-grained soils.
Water residual saturation (S_{wr})	0.43	Literature value	Average value from API database for ML soil type
LNAPL residual saturation (S_{nr})	0.2	Assumed based on previous experience and common literature values	
Hydraulic conductivity (K)	0.7 ft/day	Literature value	Average value from API database for ML soil type

Table 2

LNAPL Distribution and Recovery Model (LDRM) Output Summary
AOI 6, PES Facility, Philadelphia, Pennsylvania

Modelled In-Well LNAPL Thickness (feet)	LNAPL Specific Volume (ft^3 LNAPL/ft^2 areal extent)	LNAPL Recoverable Volume (ft^3 LNAPL/ft^2 areal extent)	LNAPL Recoverable Volume (% of total volume)	LNAPL Transmissivity (ft^2/day)
5.08	0.56	0.02	3.6	0.01

```
*******************************************************************************
 *
 * File Name  = C:\Users\mrousseau\Desktop\Philadelphia Refinery\ldrm001
 * Saved time =  14 : 57,   2017 .10 . 16
 *

*******************************************************************************

 1. OPTIONS.

 * Units              =   1               (1: English Units, 2: SI Units)

 * Soil Heterogeneity =   1               ( Number of Layers: 1, 2 or 3)

 * Elevation          =   1               (1: Elevation above datum, 2: depth BGS)

 * FPR System Used    =   0               (1: well,  2: trench,  0: Not used)

 * Smear Correction   =   0               (0: no adjustment, 1: smear correction)

 * LNAPL Residual     =   1               (1: const (user), 2: const (f), 3:
variable)


 2. INPUT PARAMETERS.

 2.1 BASIC INPUT PARAMETERS.
 Monitor. Well LNAPL thickness[ft]=          5.080
 Ground Surface Elevation [ft]    =          6.330
 Groundwater Table Elevation [ft] =          2.190
 Water Vertical Gradient(+up)     =          0.000
 LNAPL Density [g/cm3]            =          0.870
 LNAPL Viscosity [cp]             =          5.000
 Water Surface Tension [dyne/cm]  =         65.000
 LNAPL Surface Tension [dyne/cm]  =         25.000
 LNAPL/Water Interfacial Tension  =         25.000

 2.1.1 SOIL PROPERTIES OF LAYER 1
 Relative permeability model      =              1     (Mualem)
 Soil porosity                    =          0.450
 Hydraulic conductivity [ft/d]    =          0.700
 van Genuchten "N"                =          2.010
 van Genuchten "Alpha" [ft-1]     =          0.195
 Swr1                             =          0.430
 Snr1                             =          0.200
 LNAPL residual f-factor          =           None


 4. Calculated Parameters

-----------------------------------------------------
 Air-LNAPL interface [ft]         =          2.850
 LNAPL-Water interface [ft]       =         -2.230
 Max. Free-Product elevation [ft] =          3.743
-----------------------------------------------------

-----------------------------------------------------
 Parameter                        :         Soil 1
-----------------------------------------------------
 van Genuchten "M"                :          0.502
 Air/LNAPL "alpha"  [ft-1]        :          0.441
 LNAPL/water "alpha" [ft-1]       :          0.066
```

5. LNAPL and Water saturation data.

Elevation [ft]	Sn	Snr	Sw	krn
3.743	0.200	0.200	0.774	0.0000
3.698	0.202	0.200	0.775	0.0001
3.654	0.204	0.200	0.775	0.0003
3.609	0.206	0.200	0.775	0.0008
3.564	0.207	0.200	0.776	0.0014
3.520	0.209	0.200	0.776	0.0023
3.475	0.210	0.200	0.776	0.0034
3.430	0.212	0.200	0.777	0.0048
3.386	0.213	0.200	0.777	0.0063
3.341	0.214	0.200	0.777	0.0082
3.297	0.215	0.200	0.778	0.0103
3.252	0.216	0.200	0.778	0.0127
3.207	0.217	0.200	0.778	0.0153
3.163	0.218	0.200	0.779	0.0182
3.118	0.218	0.200	0.779	0.0215
3.074	0.219	0.200	0.779	0.0249
3.029	0.219	0.200	0.780	0.0287
2.984	0.219	0.200	0.780	0.0327
2.940	0.219	0.200	0.780	0.0370
2.895	0.219	0.200	0.781	0.0415
2.850	0.219	0.200	0.781	0.0462
2.596	0.217	0.200	0.783	0.0419
2.342	0.216	0.200	0.784	0.0378
2.088	0.214	0.200	0.786	0.0338
1.834	0.213	0.200	0.787	0.0301
1.580	0.211	0.200	0.789	0.0265
1.326	0.210	0.200	0.790	0.0232
1.072	0.208	0.200	0.792	0.0200
0.818	0.207	0.200	0.793	0.0171
0.564	0.206	0.200	0.794	0.0144
0.310	0.205	0.200	0.795	0.0119
0.056	0.204	0.200	0.796	0.0097
-0.198	0.203	0.200	0.797	0.0076
-0.452	0.202	0.200	0.798	0.0058
-0.706	0.202	0.200	0.798	0.0043
-0.960	0.201	0.200	0.799	0.0030
-1.214	0.201	0.200	0.799	0.0019
-1.468	0.200	0.200	0.800	0.0011
-1.722	0.200	0.200	0.800	0.0005
-1.976	0.200	0.200	0.800	0.0001
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000

-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
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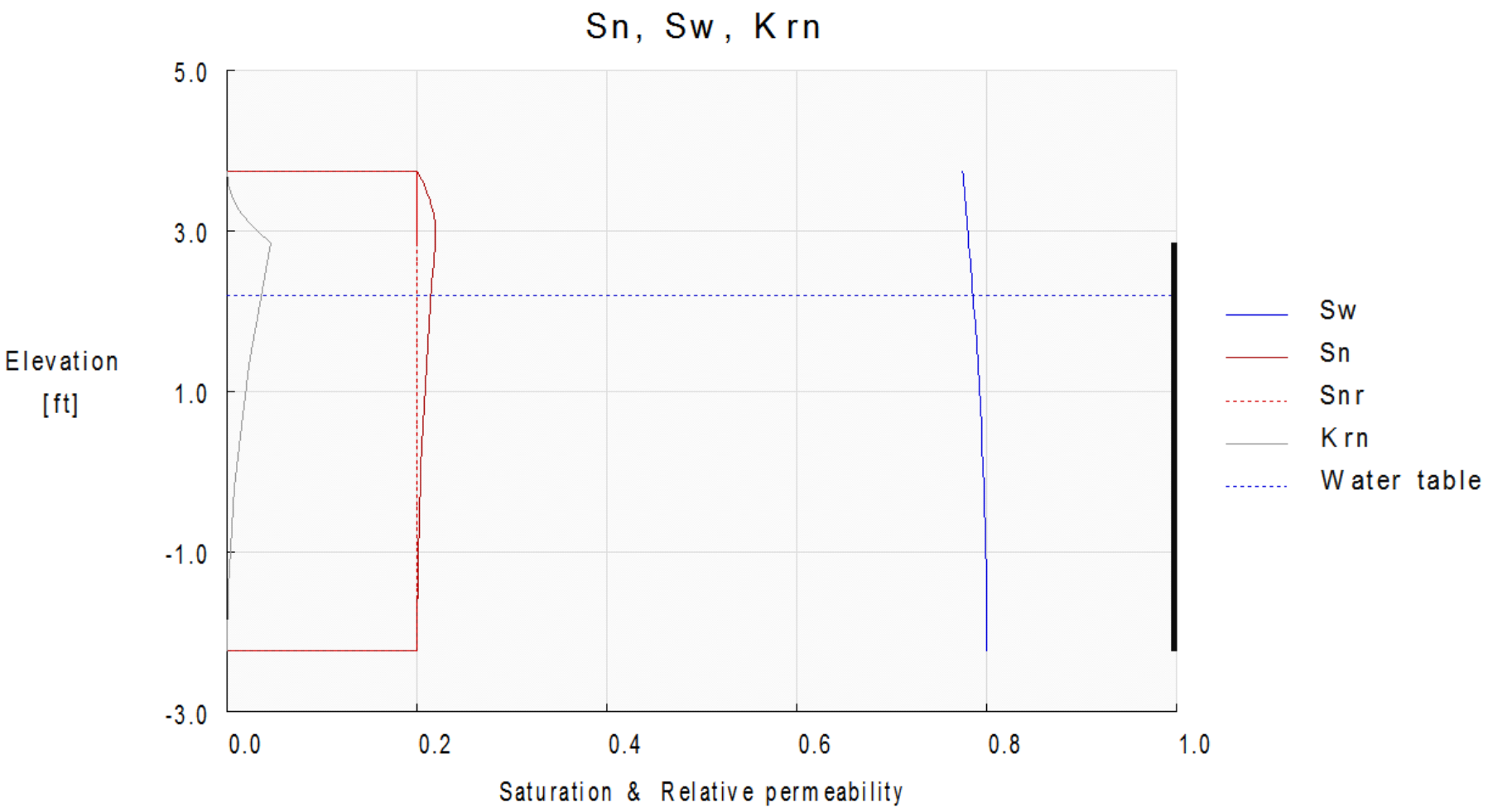
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000
-2.230	0.200	0.200	0.800	0.0000

6. LNAPL specific volume and hydraulic conductivity

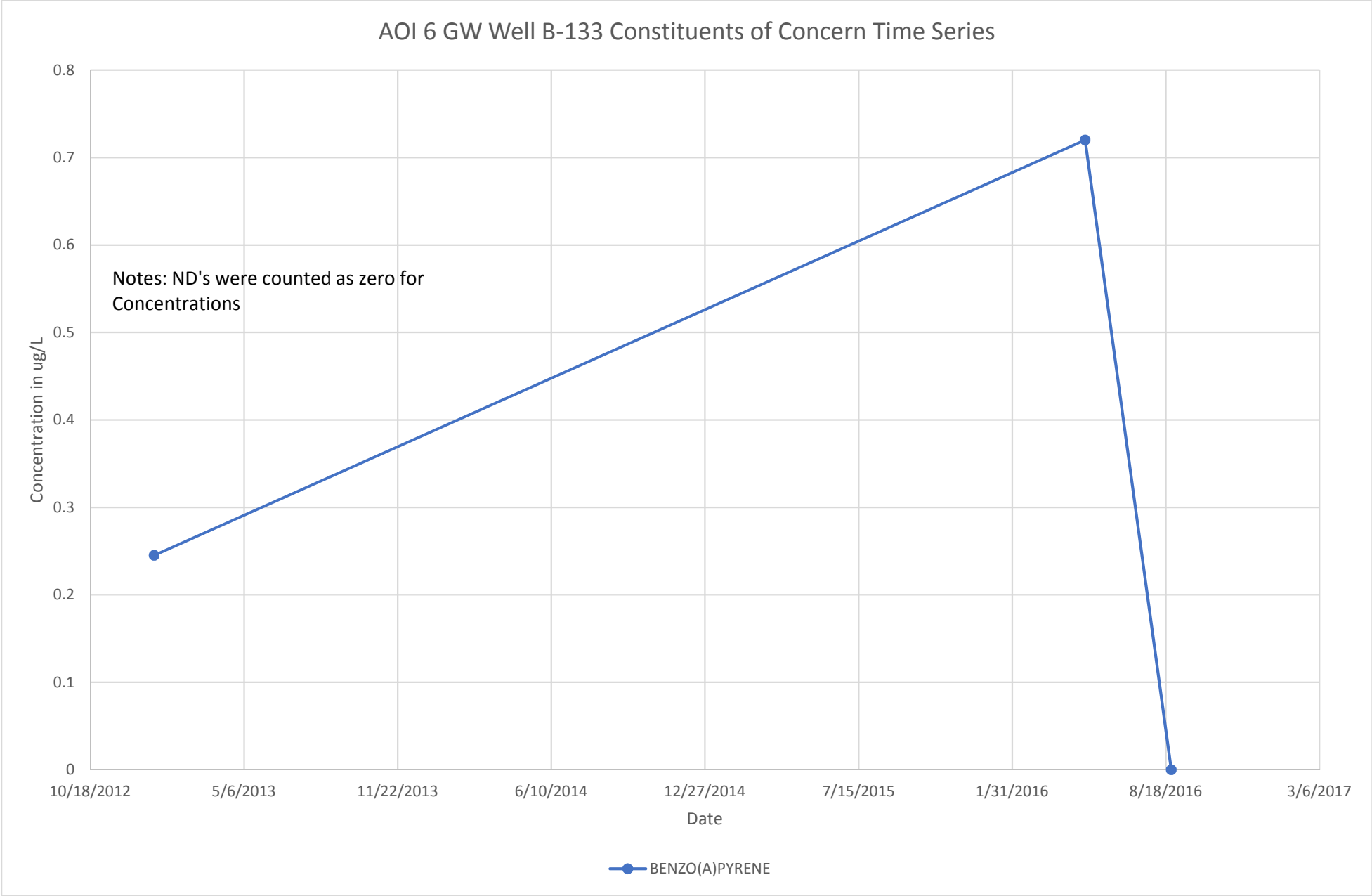
bn [ft]	Dn [ft]	Rn [ft]	Tn [ft2/d]
0.000	0.000	0.000	0.000
0.203	0.022	0.000	0.000
0.406	0.043	0.000	0.000
0.610	0.065	0.000	0.000
0.813	0.086	0.000	0.000
1.016	0.108	0.000	0.000
1.219	0.129	0.000	0.000
1.422	0.151	0.000	0.000
1.626	0.173	0.001	0.000
1.829	0.194	0.001	0.001
2.032	0.216	0.001	0.001
2.235	0.238	0.002	0.001
2.438	0.260	0.002	0.001
2.642	0.282	0.003	0.002
2.845	0.305	0.004	0.002
3.048	0.327	0.005	0.002
3.251	0.350	0.006	0.003
3.454	0.372	0.007	0.004
3.658	0.395	0.008	0.004
3.861	0.418	0.009	0.005
4.064	0.441	0.011	0.006
4.267	0.464	0.012	0.007
4.470	0.487	0.014	0.008
4.674	0.510	0.016	0.009
4.877	0.534	0.018	0.010
5.080	0.558	0.020	0.011

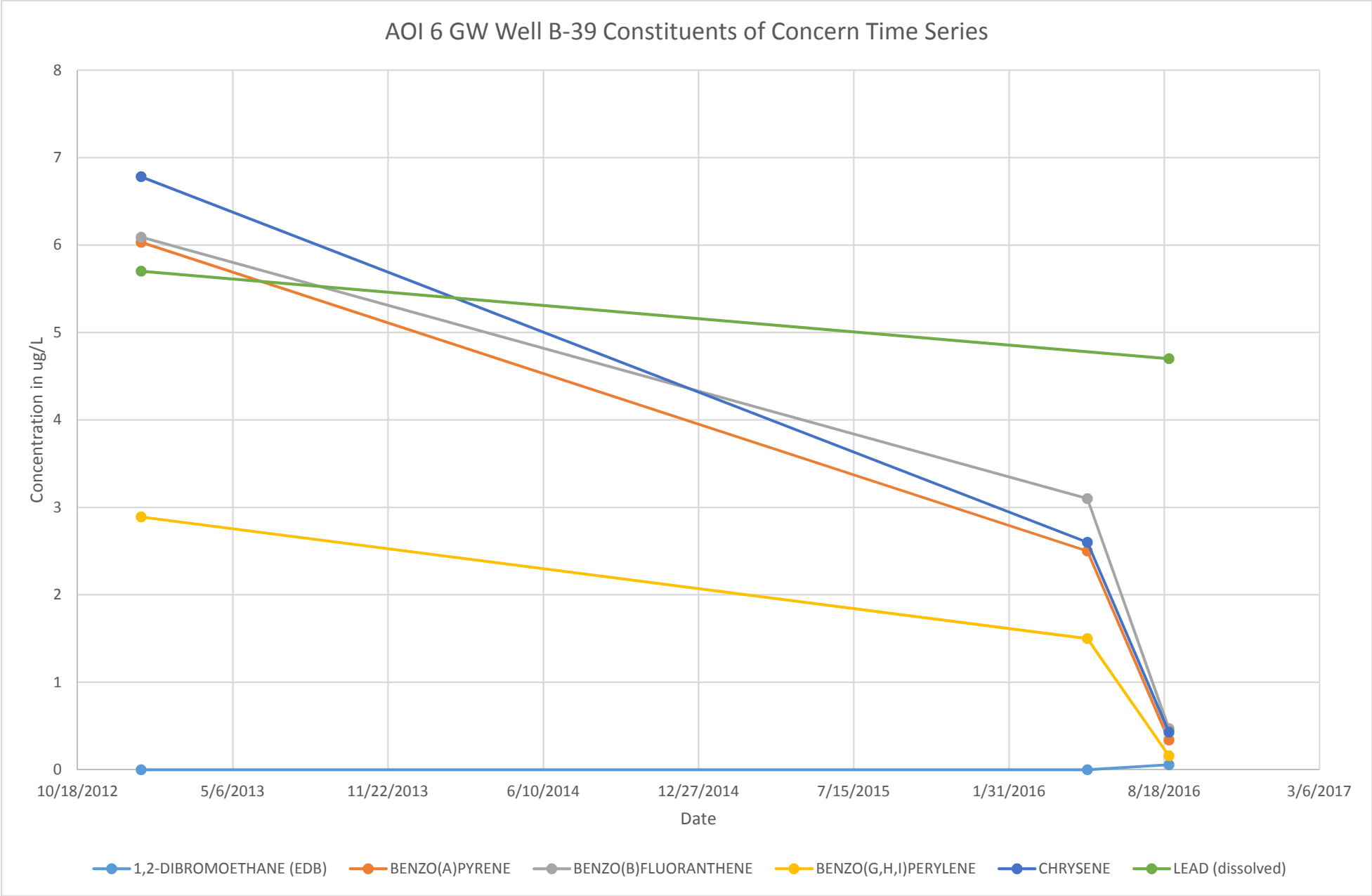
7. Data for curve-fitting segments

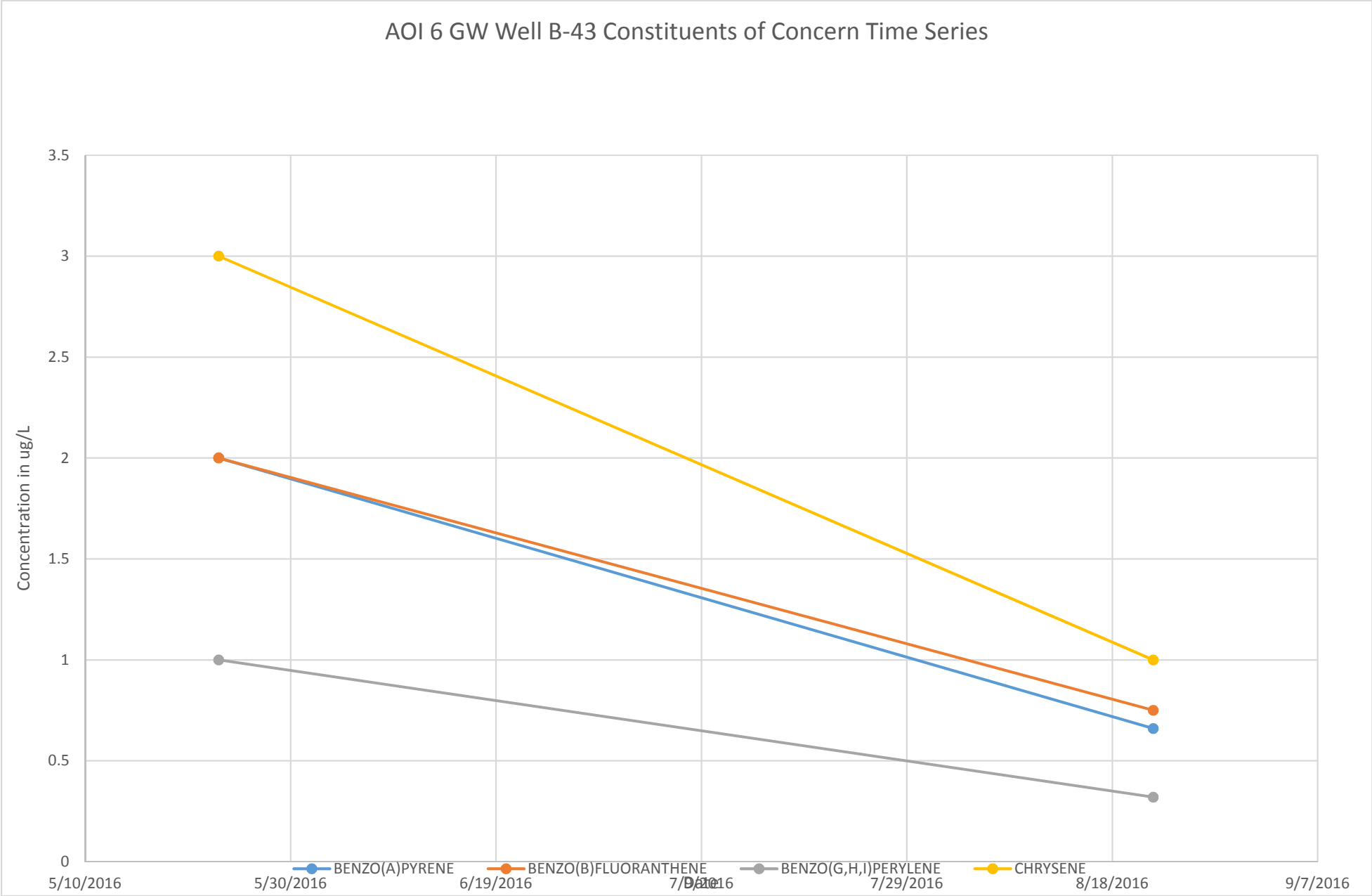
bn[ft]	Rn[ft]	Tn[ft2/d]	chi[ft]	beta	xi[ft]	eta
0.00000	0.00000	0.00000				
3.45440	0.00659	0.00362	0.00000	0.00191	0.00000	0.00105
4.26720	0.01225	0.00677	2.50854	0.00696	2.52117	0.00388
5.08000	0.02031	0.01130	3.03356	0.00993	3.05314	0.00558

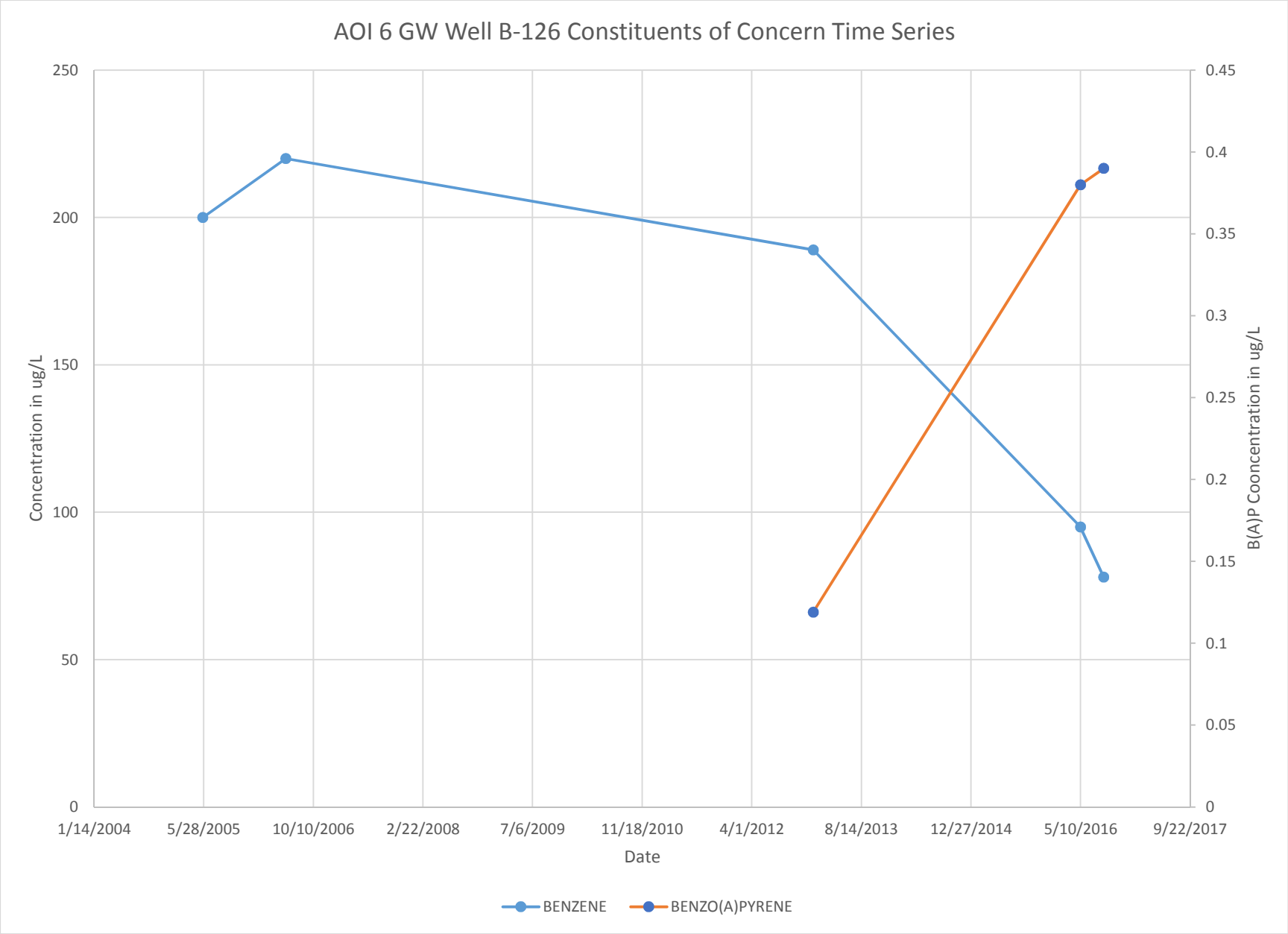

Sn, Sw, Krn
5.0
3.0
1.0
-1.0
-3.0
Elevation
[ft]
0.0
0.2
0.4
0.6
0.8
1.0
Saturation & Relative permeability
Sw
Sn
Snr
Krn
Water table

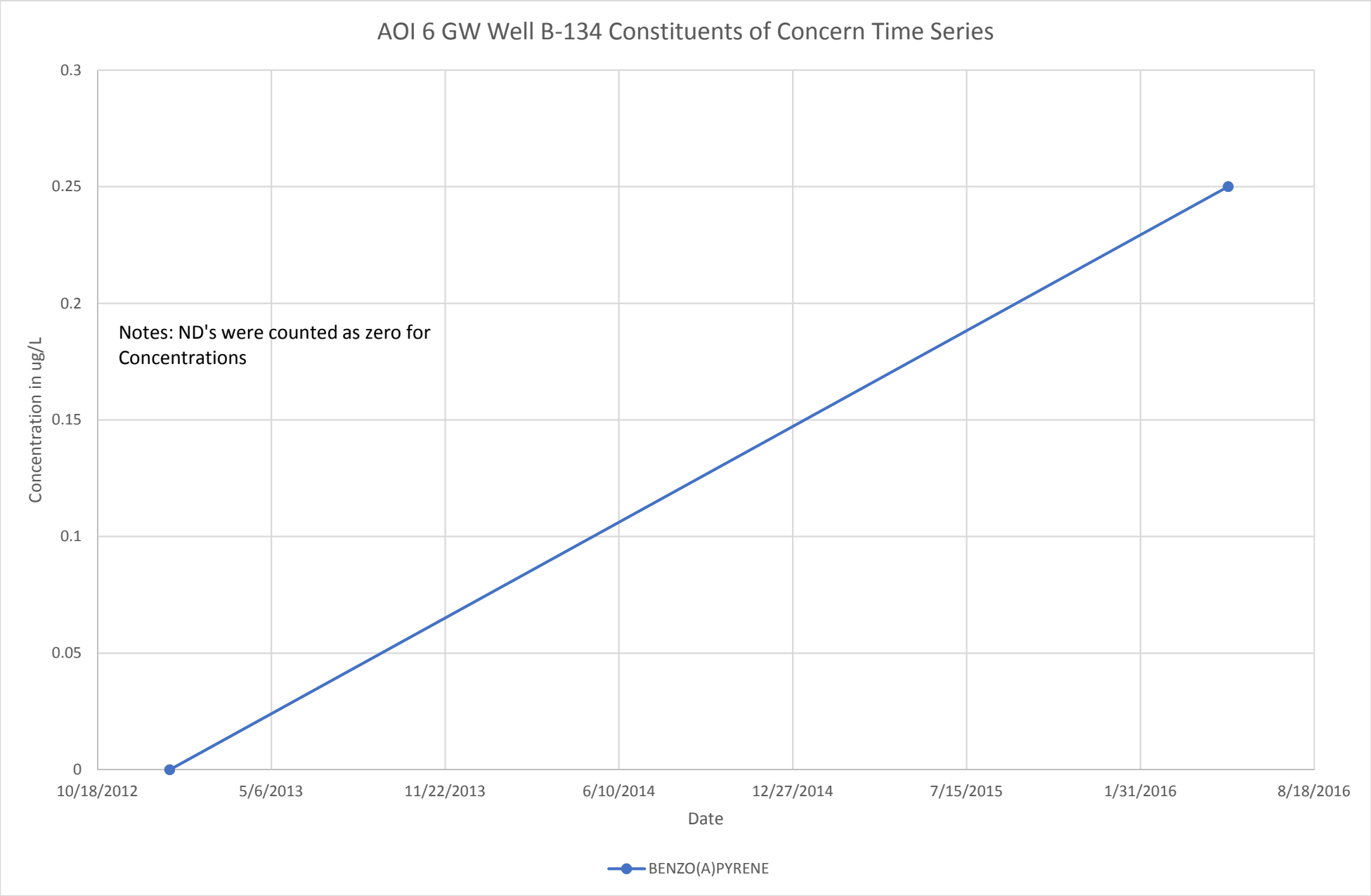
Appendix F.4
Concentration versus Time Graphs

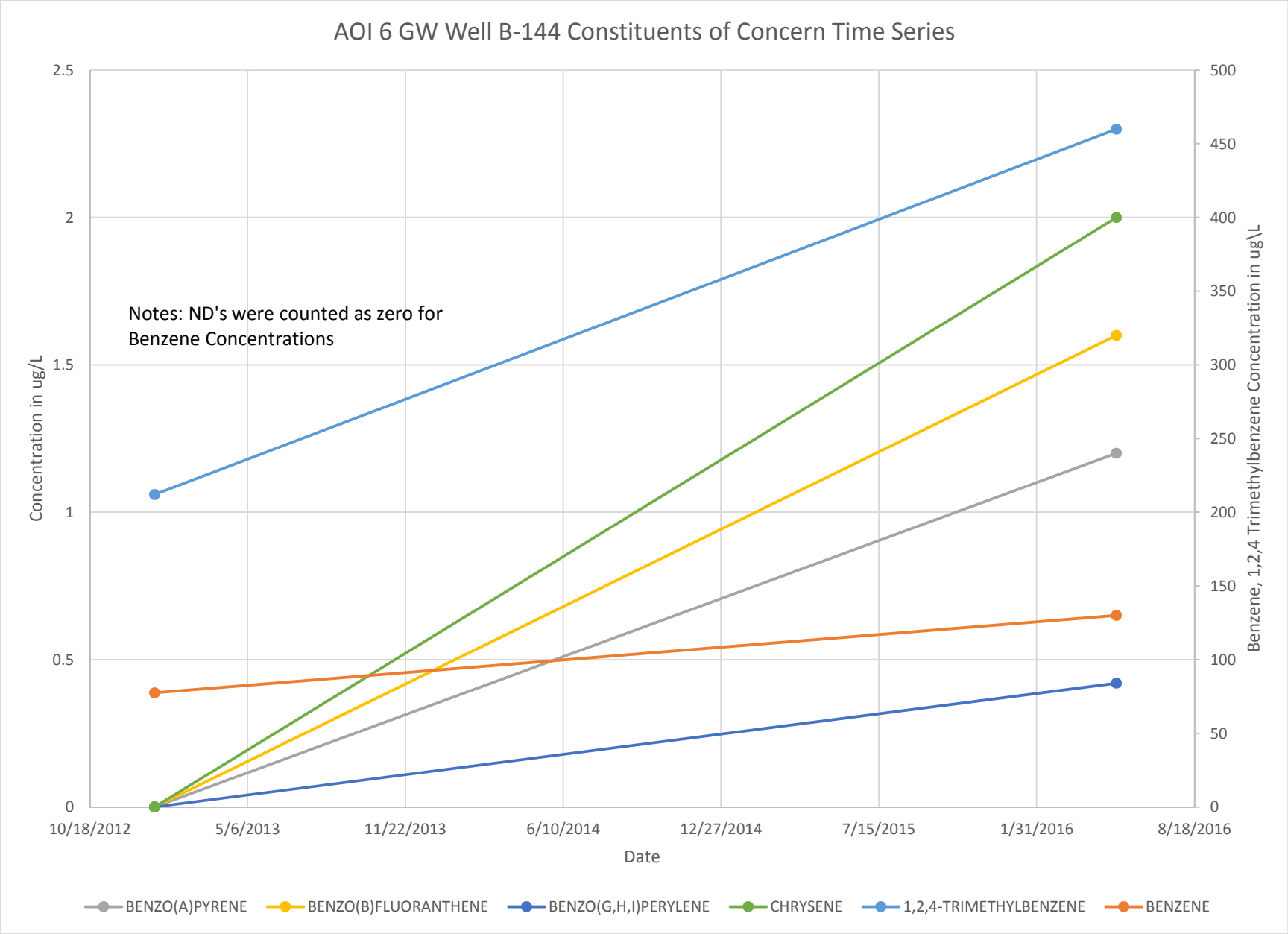

AOI 6 GW Well B-133 Constituents of Concern Time Series
Notes: ND's were counted as zero for Concentrations
Concentration in ug/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
BENZO(A)PYRENE

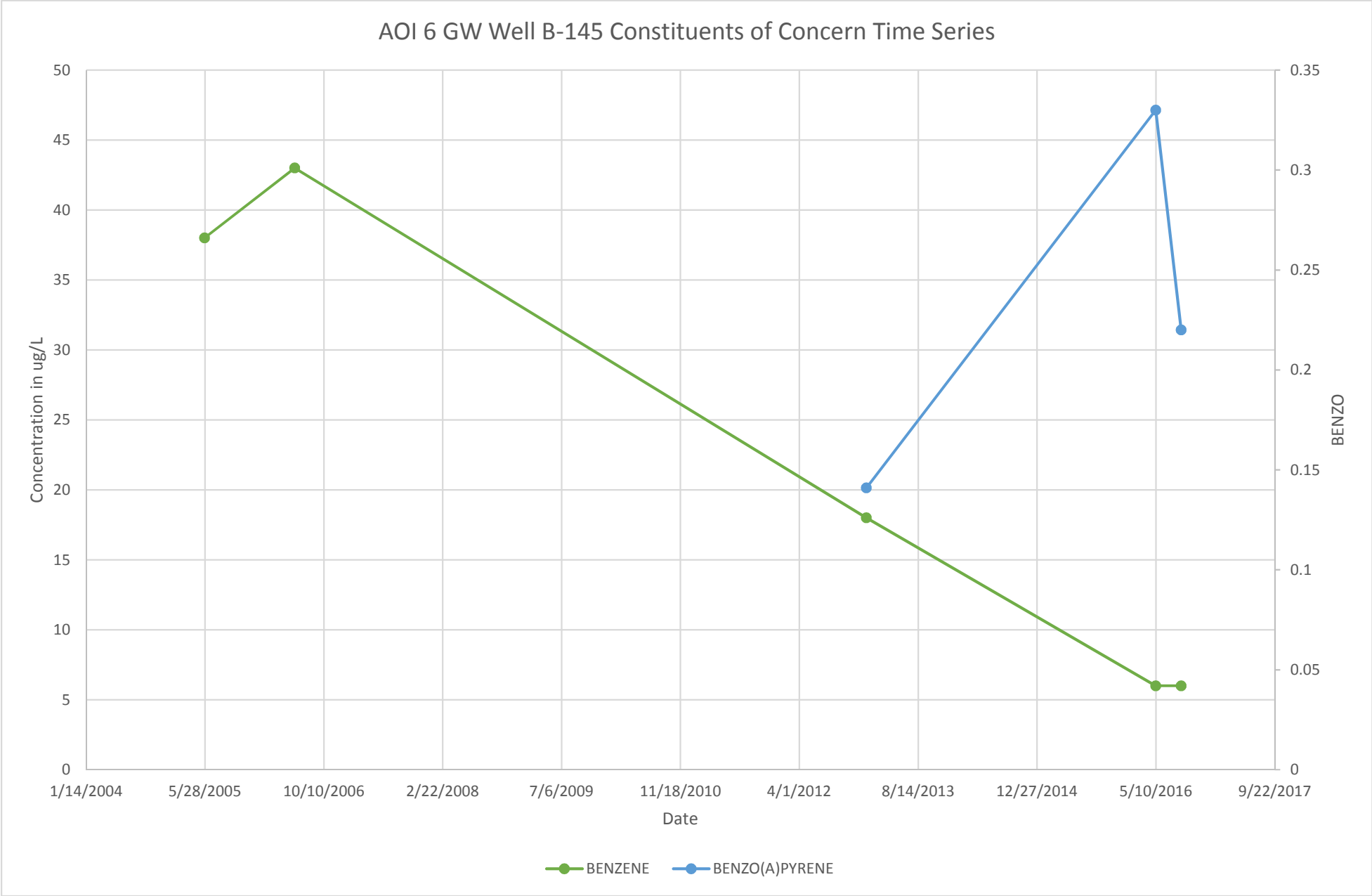

AOI 6 GW Well B-39 Constituents of Concern Time Series
Concentration in ug/L
8
7
6
5
4
3
2
1
0
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
1,2-DIBROMOETHANE (EDB)
BENZO(A)PYRENE
BENZO(B)FLUORANTHENE
BENZO(G,H,I)PERYLENE
CHRYSENE
LEAD (dissolved)

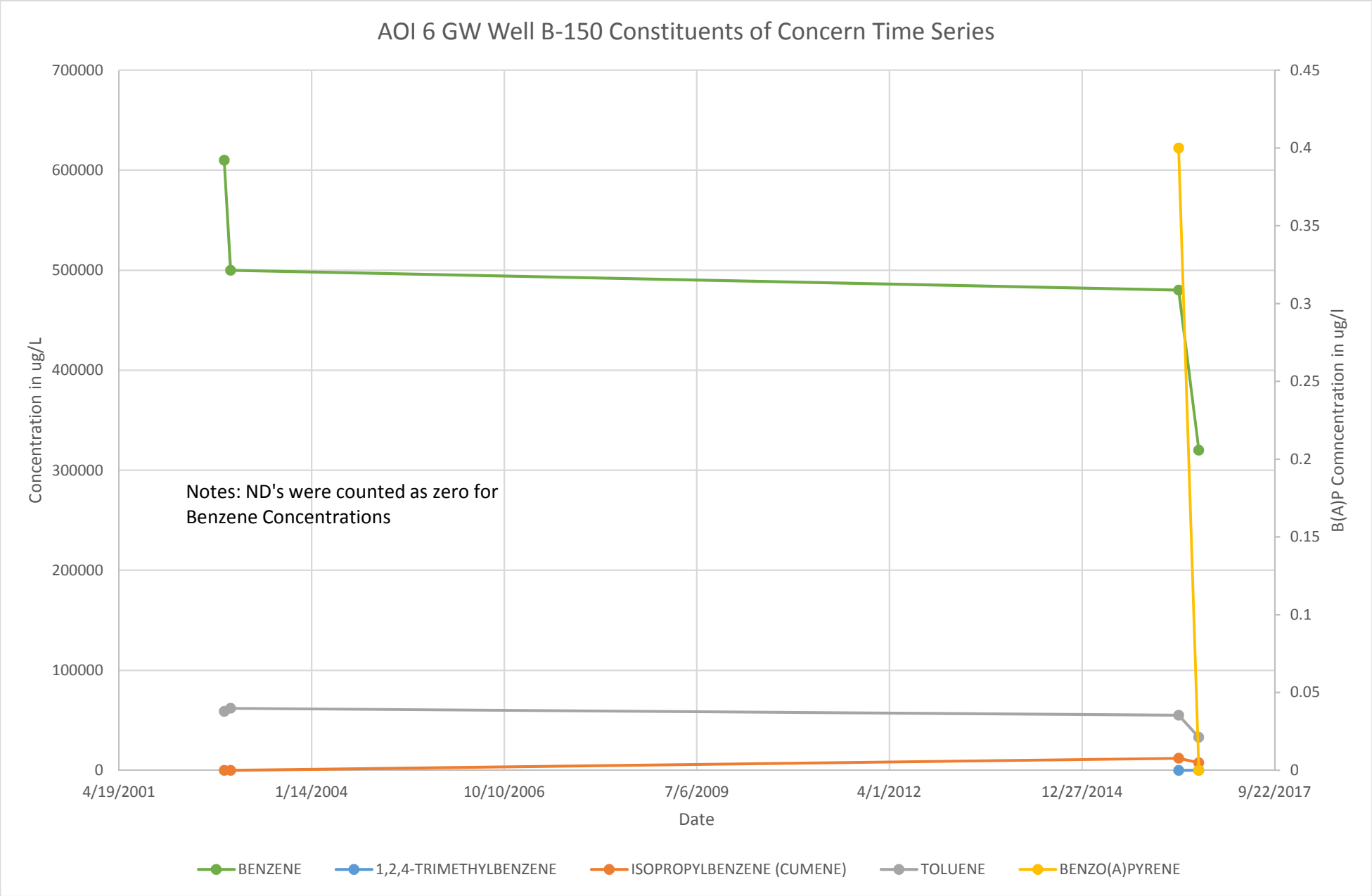

AOI 6 GW Well B-43 Constituents of Concern Time Series
Concentration in ug/L
3.5
3
2.5
2
1.5
1
0.5
0
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
9/7/2016
BENZO(A)PYRENE
BENZO(B)FLUORANTHENE
BENZO(G,H,I)PERYLENE
CHRYSENE

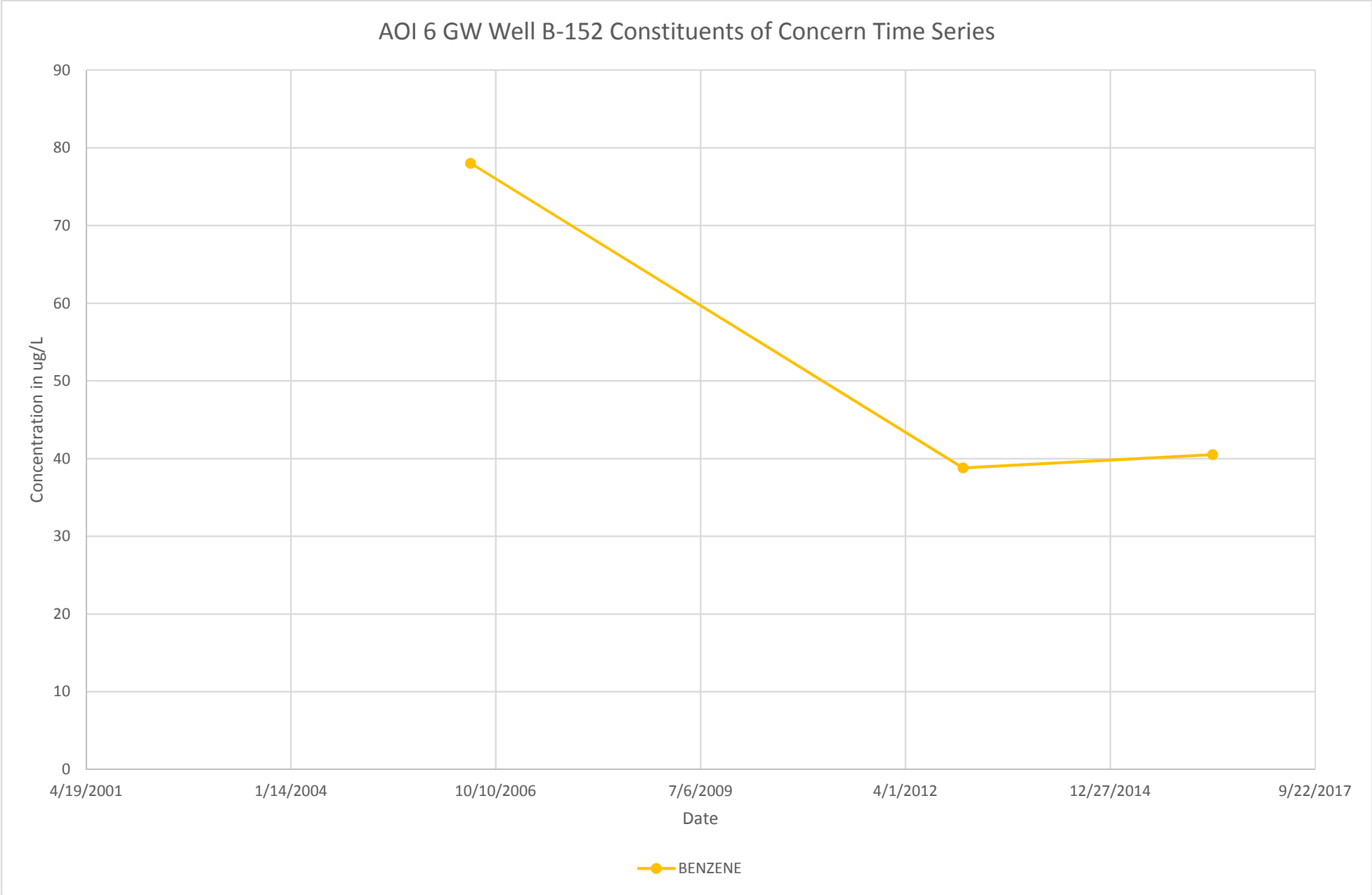

AOI 6 GW Well B-126 Constituents of Concern Time Series
Concentration in ug/L
B(A)P Cooncentration in ug/L
Date
250
200
150
100
50
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1/14/2004
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
BENZENE
BENZO(A)PYRENE

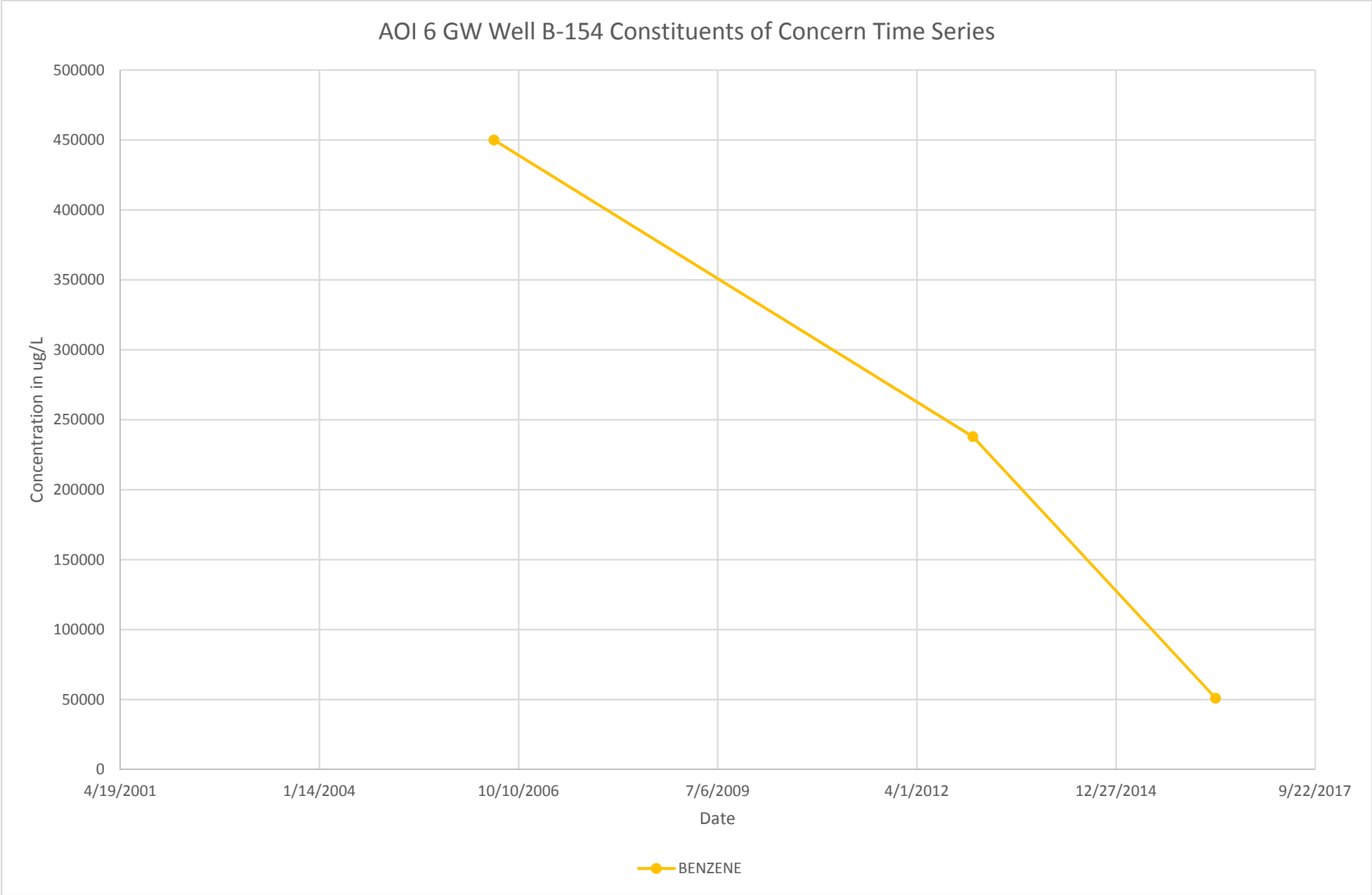

AOI 6 GW Well B-134 Constituents of Concern Time Series
0.3
0.25
0.2
0.15
0.1
0.05
0
Concentration in ug/L
Notes: ND's were counted as zero for Concentrations
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
Date
BENZO(A)PYRENE

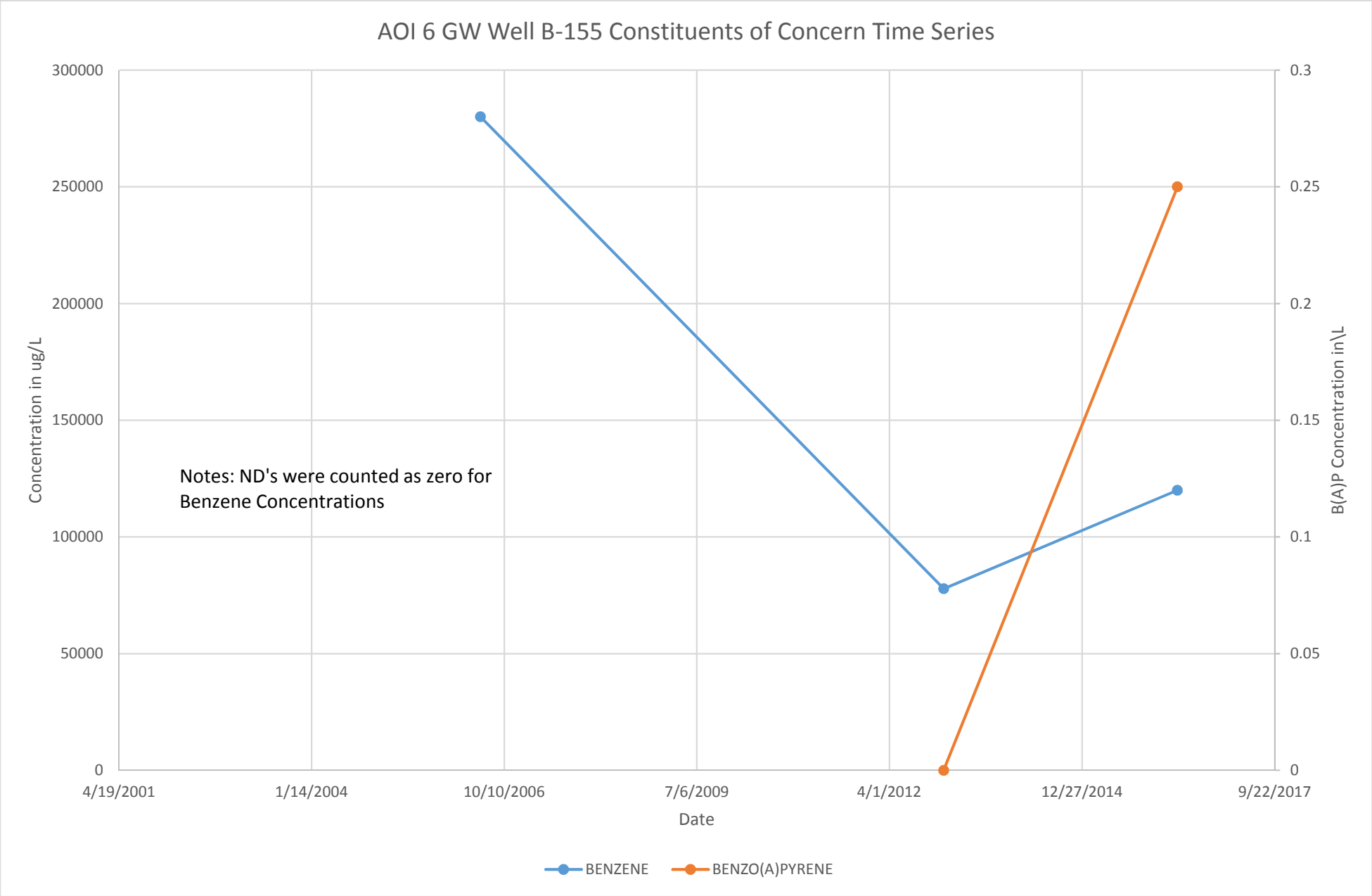

AOI 6 GW Well B-144 Constituents of Concern Time Series
Notes: ND's were counted as zero for Benzene Concentrations
Concentration in ug/L
Benzene, 1,2,4 Trimethylbenzene Concentration in ug\L
Date
2.5
2
1.5
1
0.5
0
500
450
400
350
300
250
200
150
100
50
0
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
BENZO(A)PYRENE
BENZO(B)FLUORANTHENE
BENZO(G,H,I)PERYLENE
CHRYSENE
1,2,4-TRIMETHYLBENZENE
BENZENE

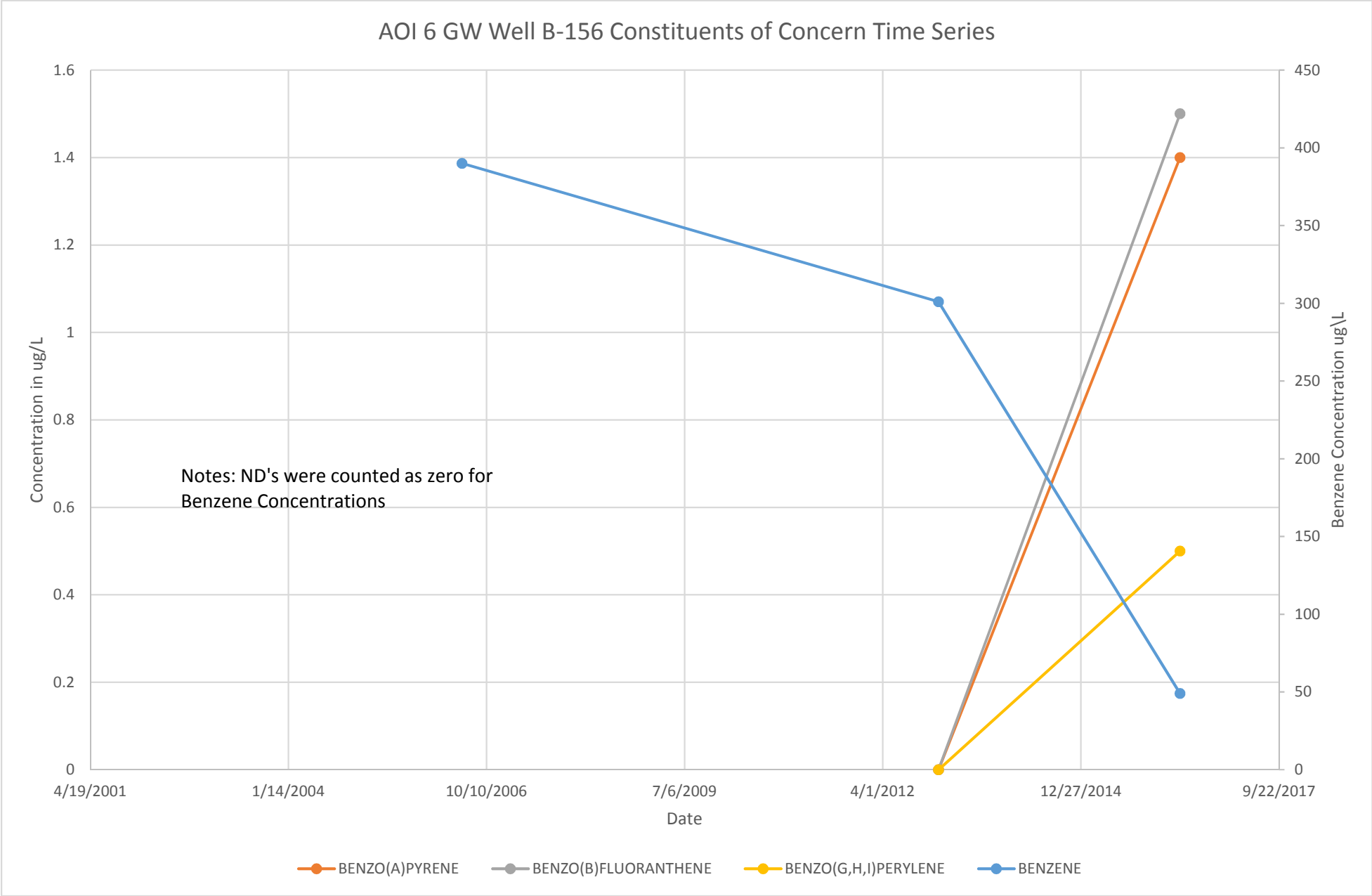

AOI 6 GW Well B-145 Constituents of Concern Time Series
Concentration in ug/L
BENZO
Date
50
45
40
35
30
25
20
15
10
5
0
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1/14/2004
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
BENZENE
BENZO(A)PYRENE

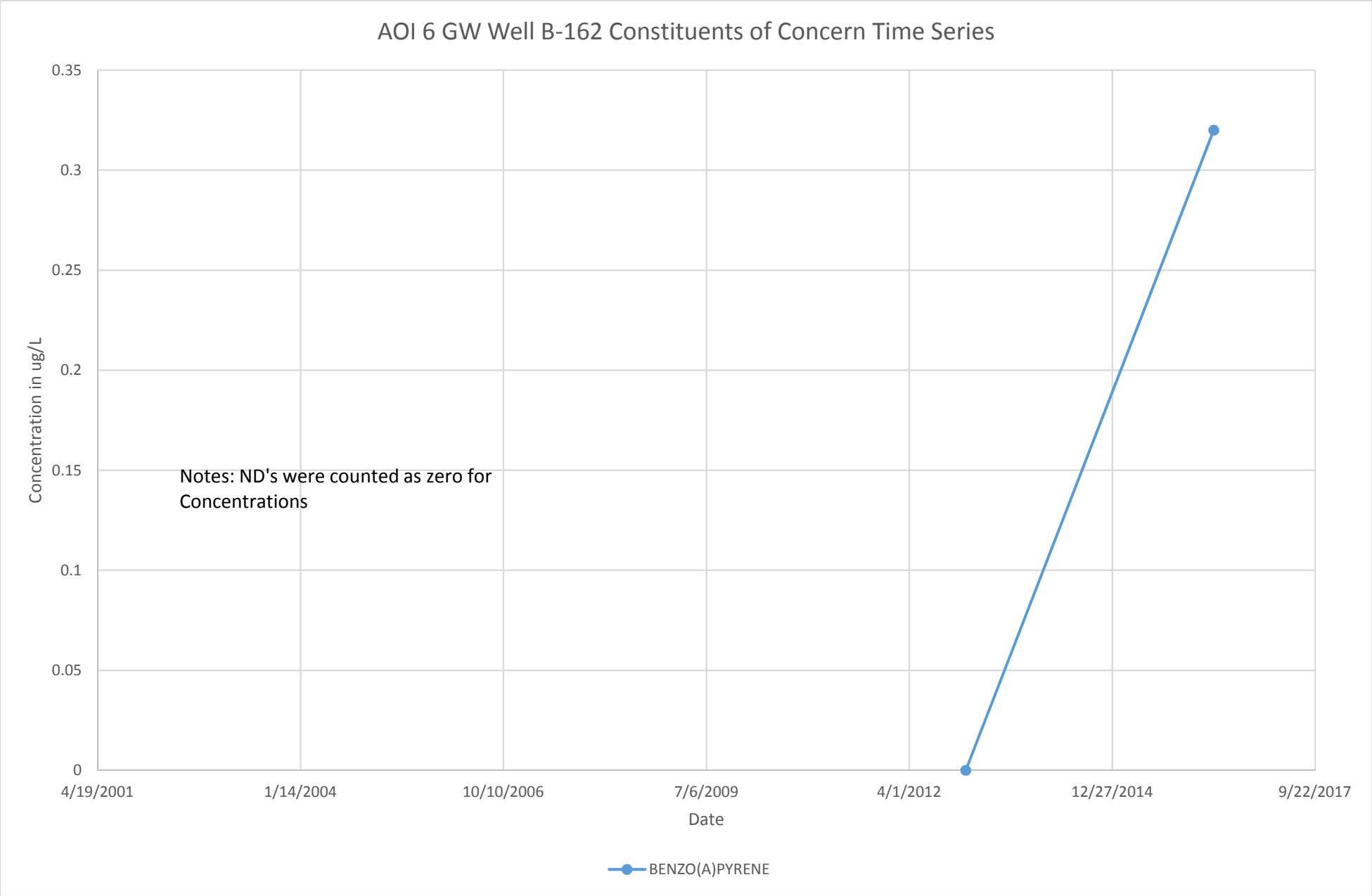

AOI 6 GW Well B-150 Constituents of Concern Time Series
Concentration in ug/L
B(A)P Comncentration in ug/l
Date
700000
600000
500000
400000
300000
200000
100000
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Notes: ND's were counted as zero for Benzene Concentrations
BENZENE
1,2,4-TRIMETHYLBENZENE
ISOPROPYLBENZENE (CUMENE)
TOLUENE
BENZO(A)PYRENE

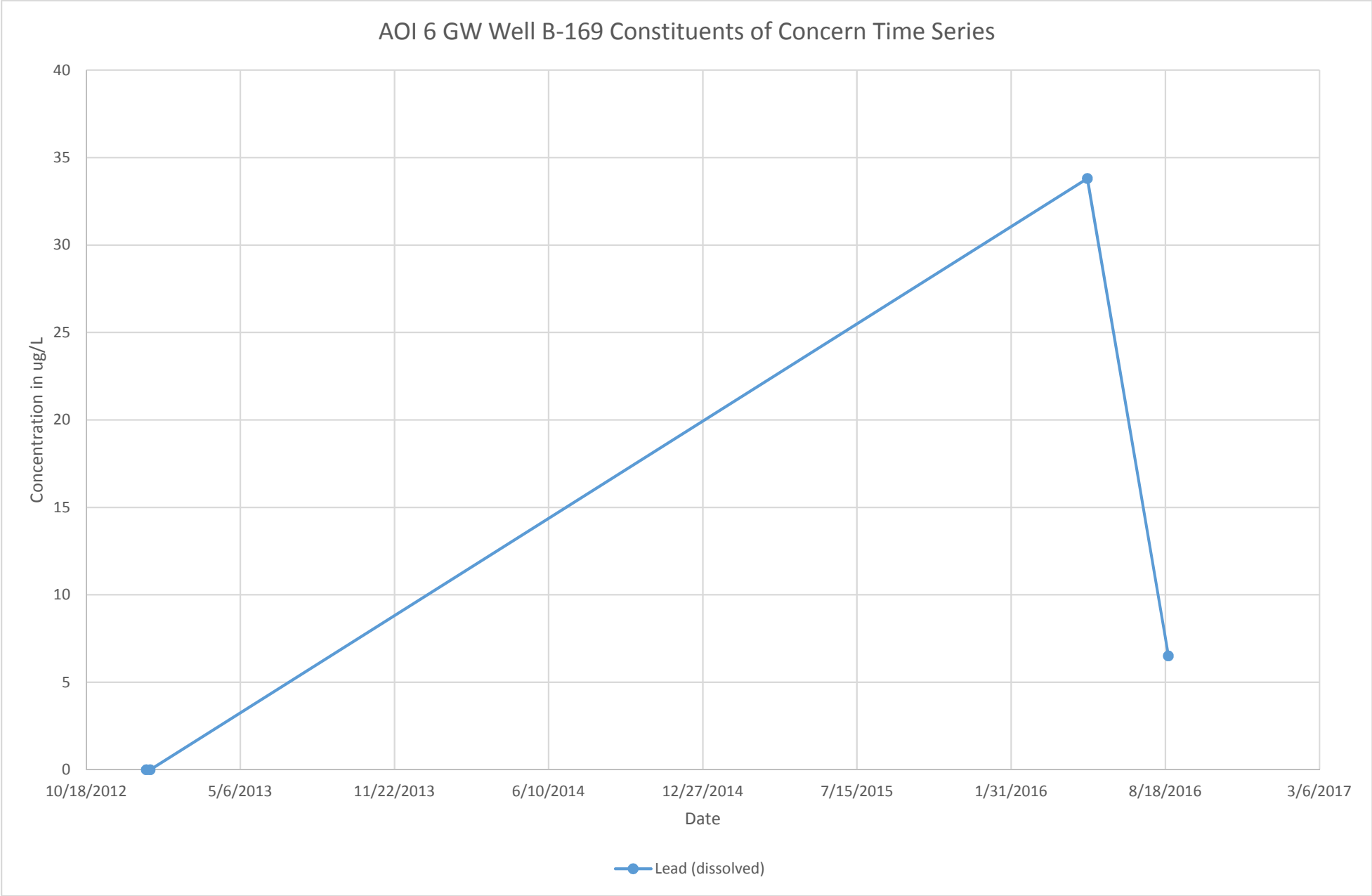

AOI 6 GW Well B-152 Constituents of Concern Time Series
Concentration in ug/L
90
80
70
60
50
40
30
20
10
0
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date
BENZENE

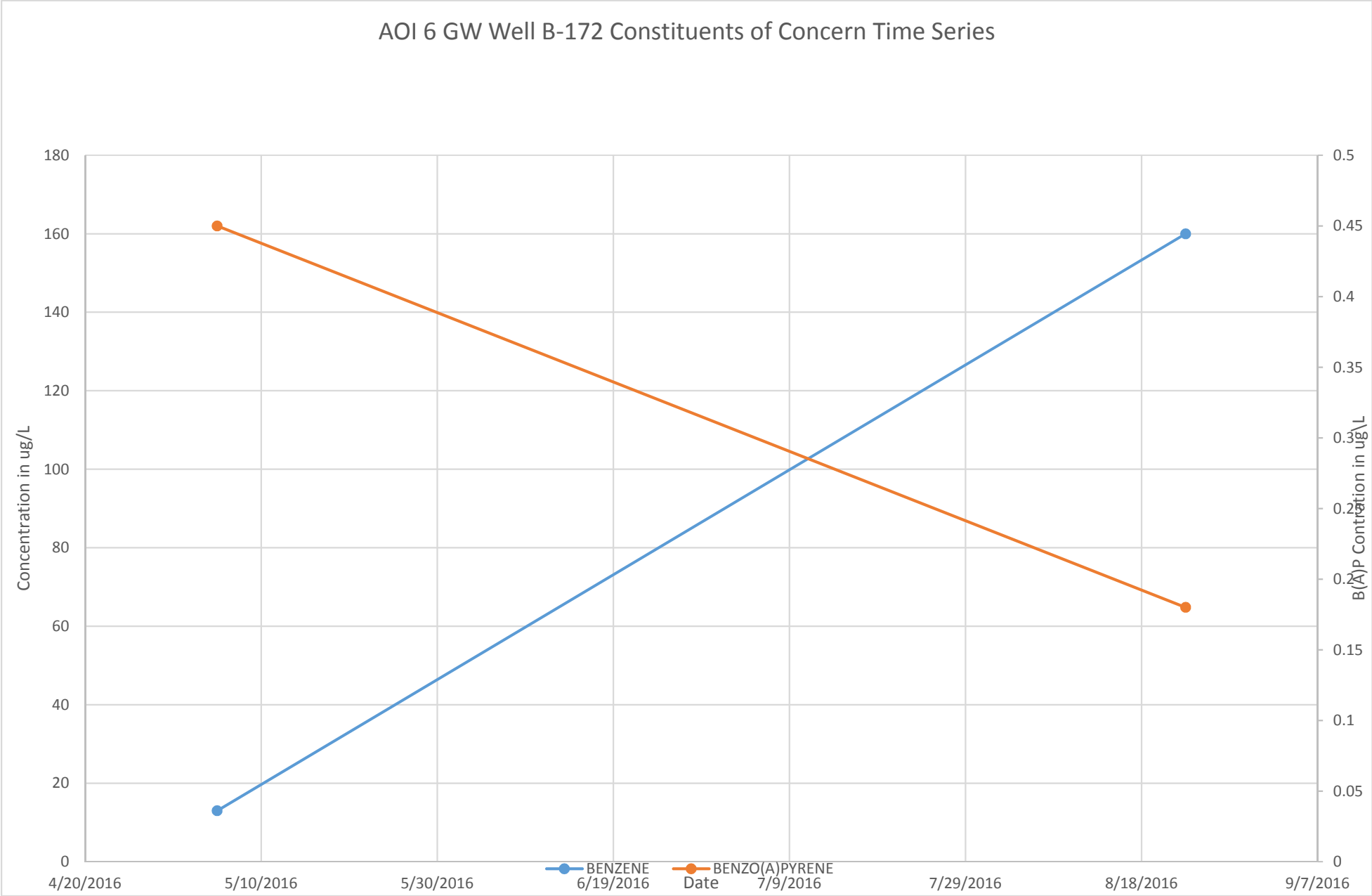

AOI 6 GW Well B-154 Constituents of Concern Time Series
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
Concentration in ug/L
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date
BENZENE

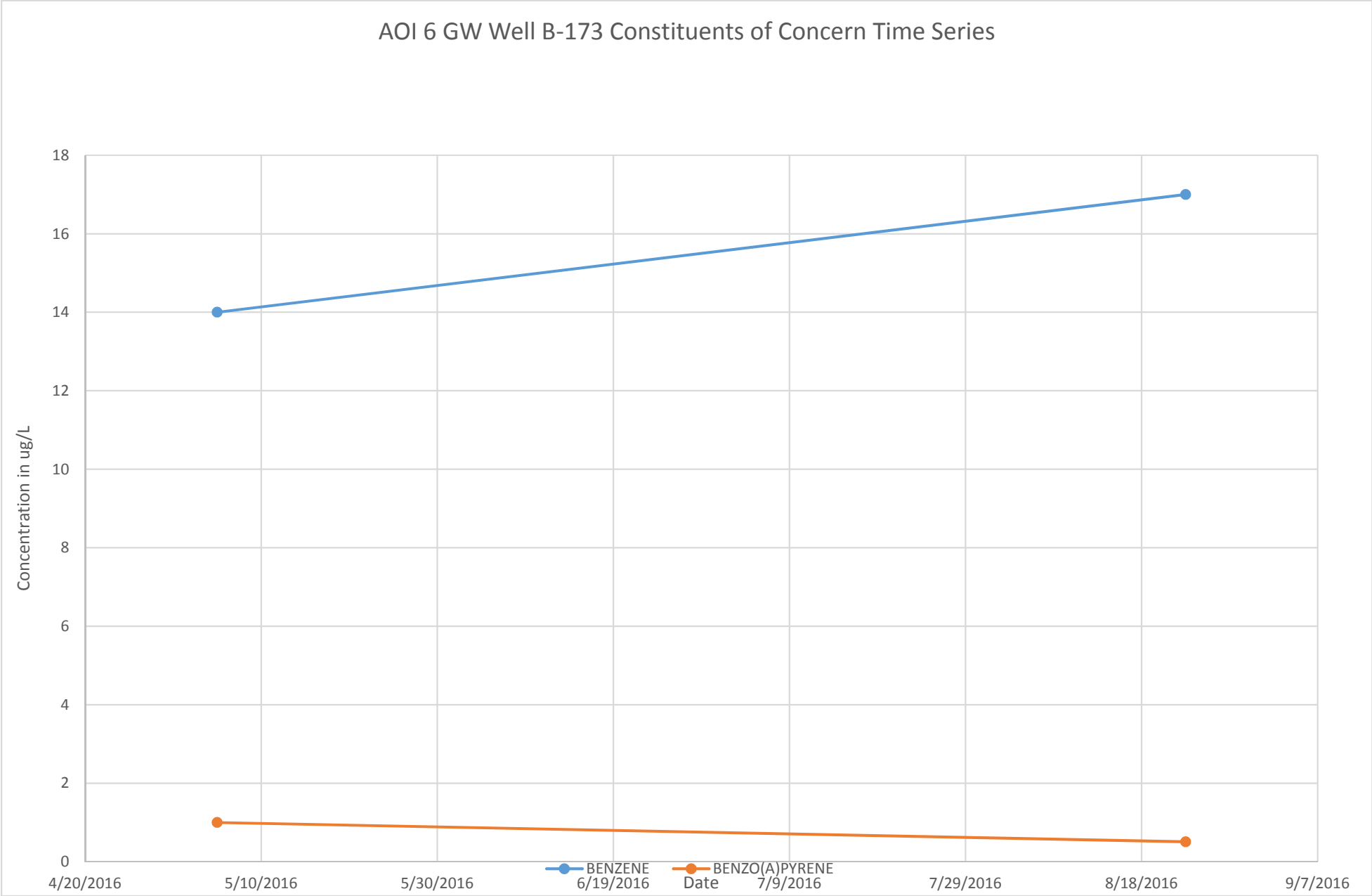

AOI 6 GW Well B-155 Constituents of Concern Time Series
300000
250000
200000
150000
100000
50000
0
Concentration in ug/L
0.3
0.25
0.2
0.15
0.1
0.05
0
B(A)P Concentration in\L
Notes: ND's were counted as zero for Benzene Concentrations
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date
BENZENE
BENZO(A)PYRENE

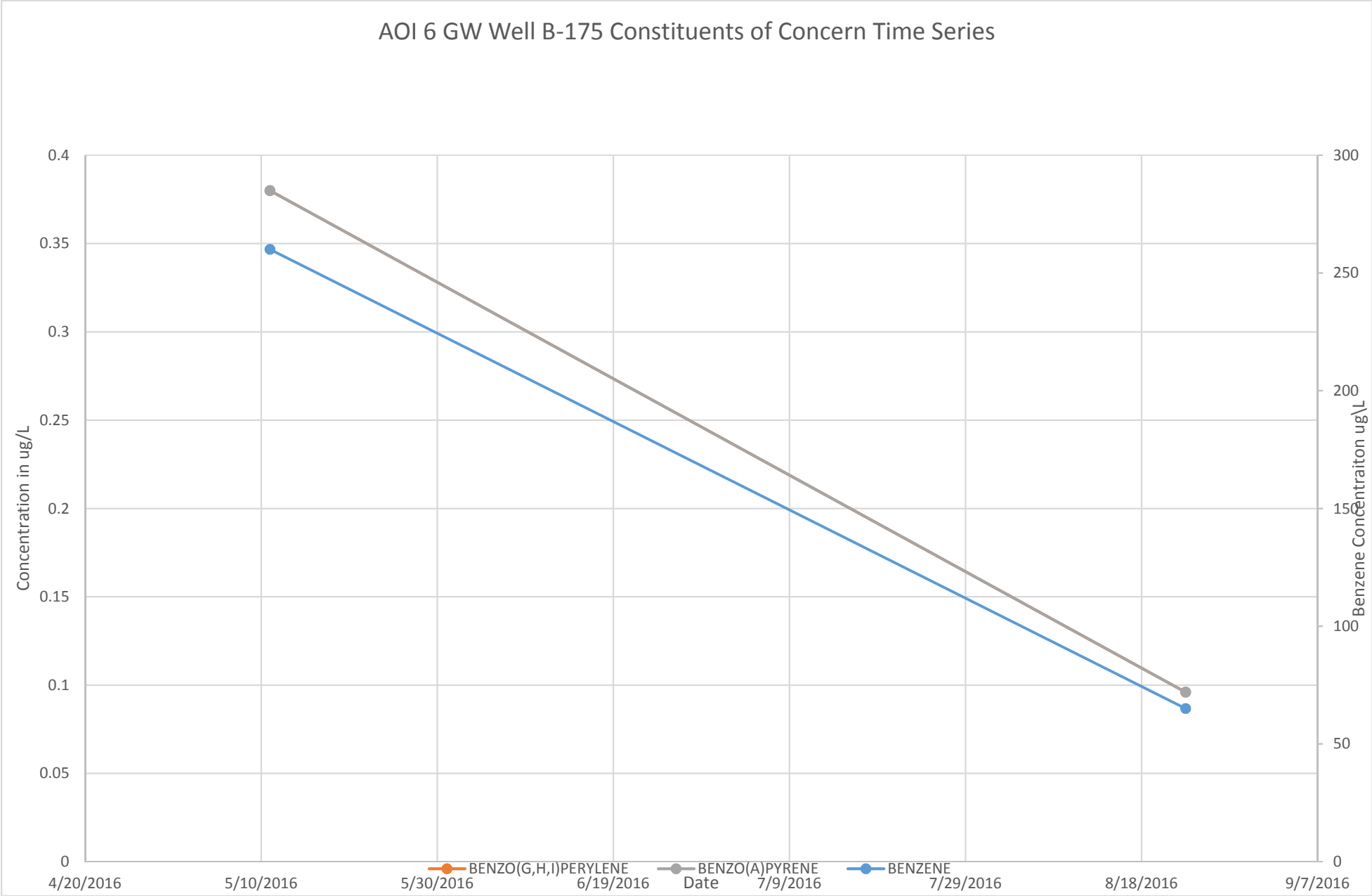

AOI 6 GW Well B-156 Constituents of Concern Time Series
Concentration in ug/L
Benzene Concentration ug\L
Date
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
450
400
350
300
250
200
150
100
50
0
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Notes: ND's were counted as zero for Benzene Concentrations
BENZO(A)PYRENE
BENZO(B)FLUORANTHENE
BENZO(G,H,I)PERYLENE
BENZENE

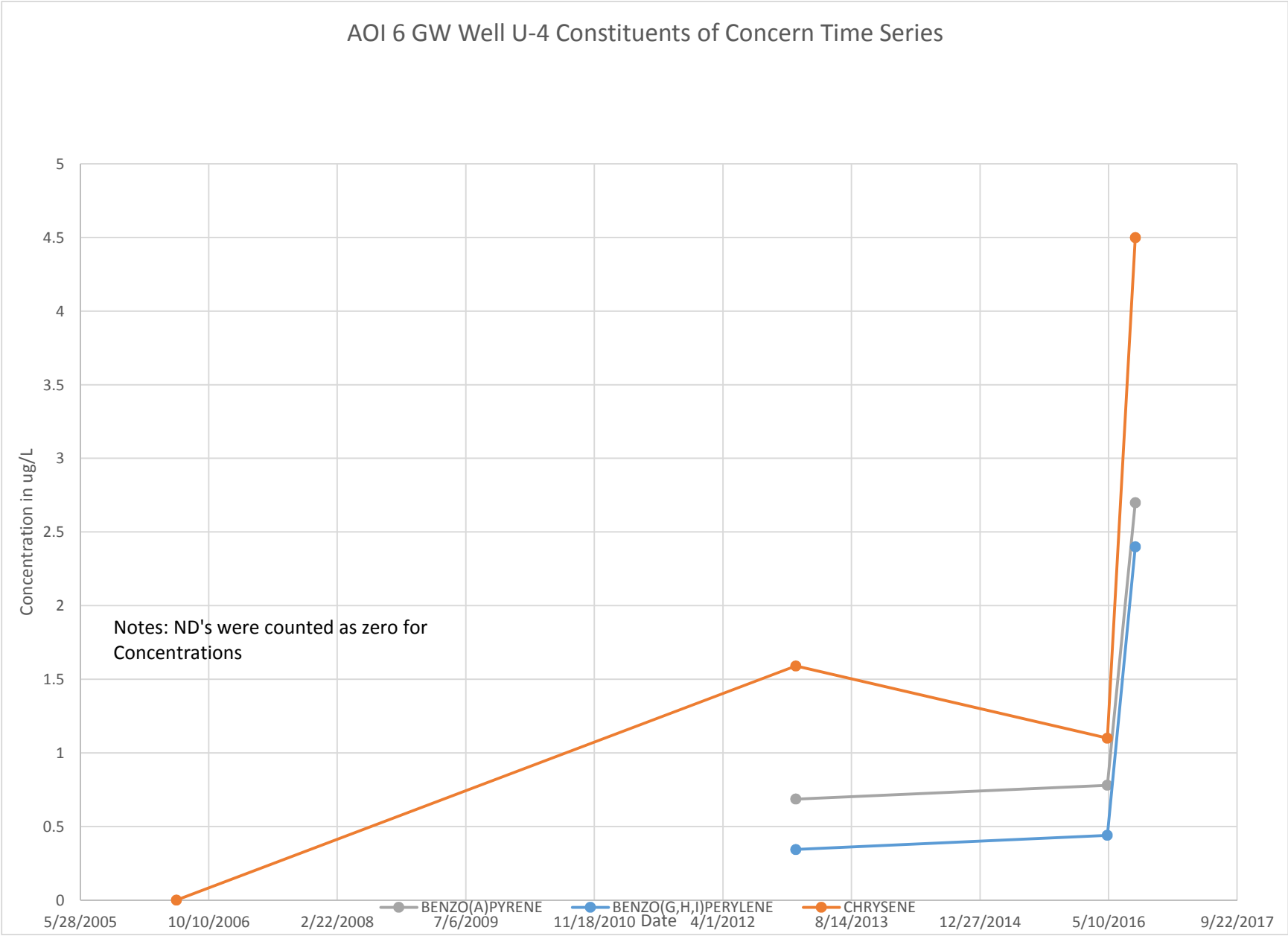

AOI 6 GW Well B-162 Constituents of Concern Time Series
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Concentration in ug/L
Notes: ND's were counted as zero for Concentrations
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date
BENZO(A)PYRENE

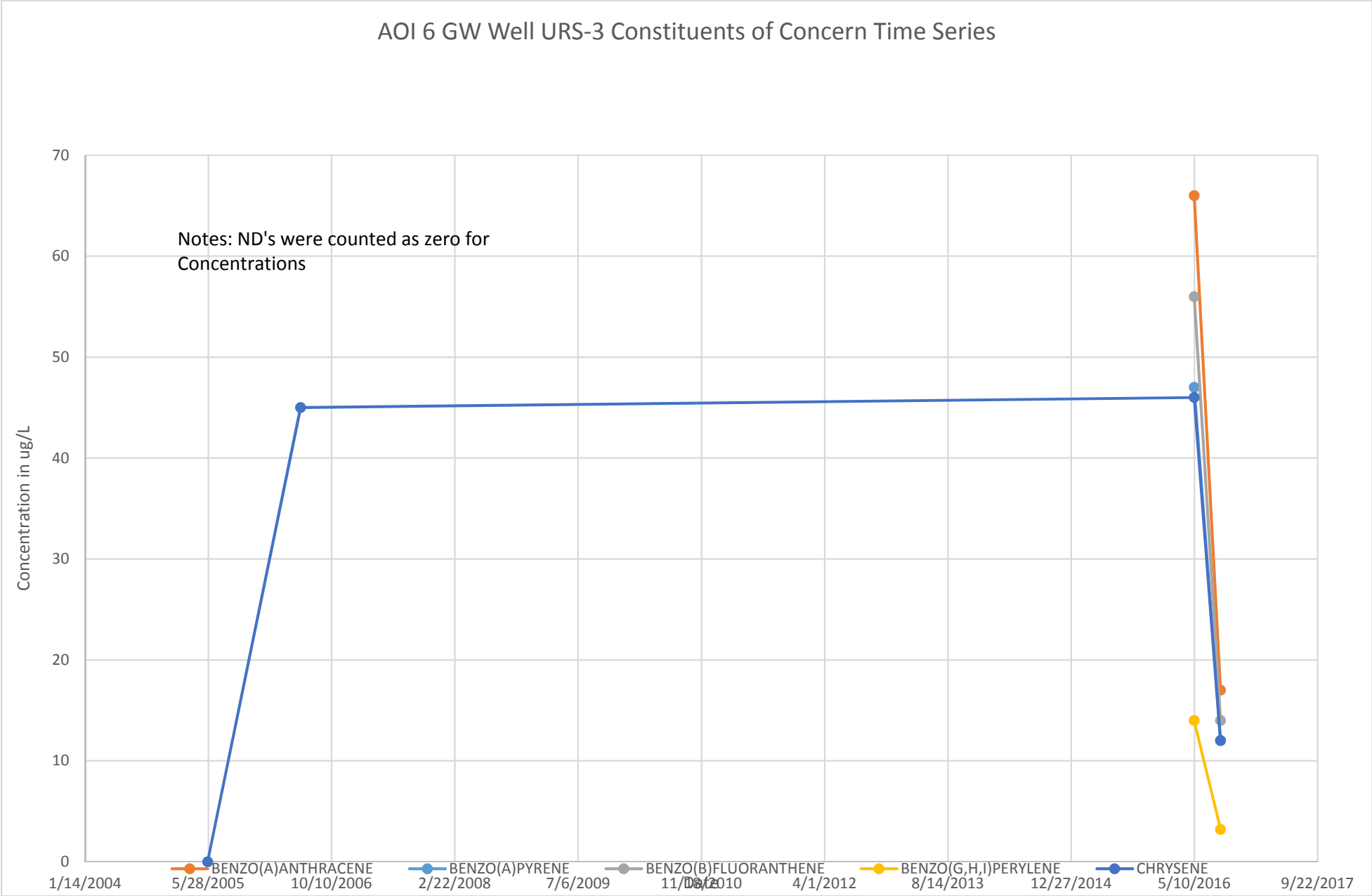

AOI 6 GW Well B-169 Constituents of Concern Time Series
Concentration in ug/L
40
35
30
25
20
15
10
5
0
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Lead (dissolved)

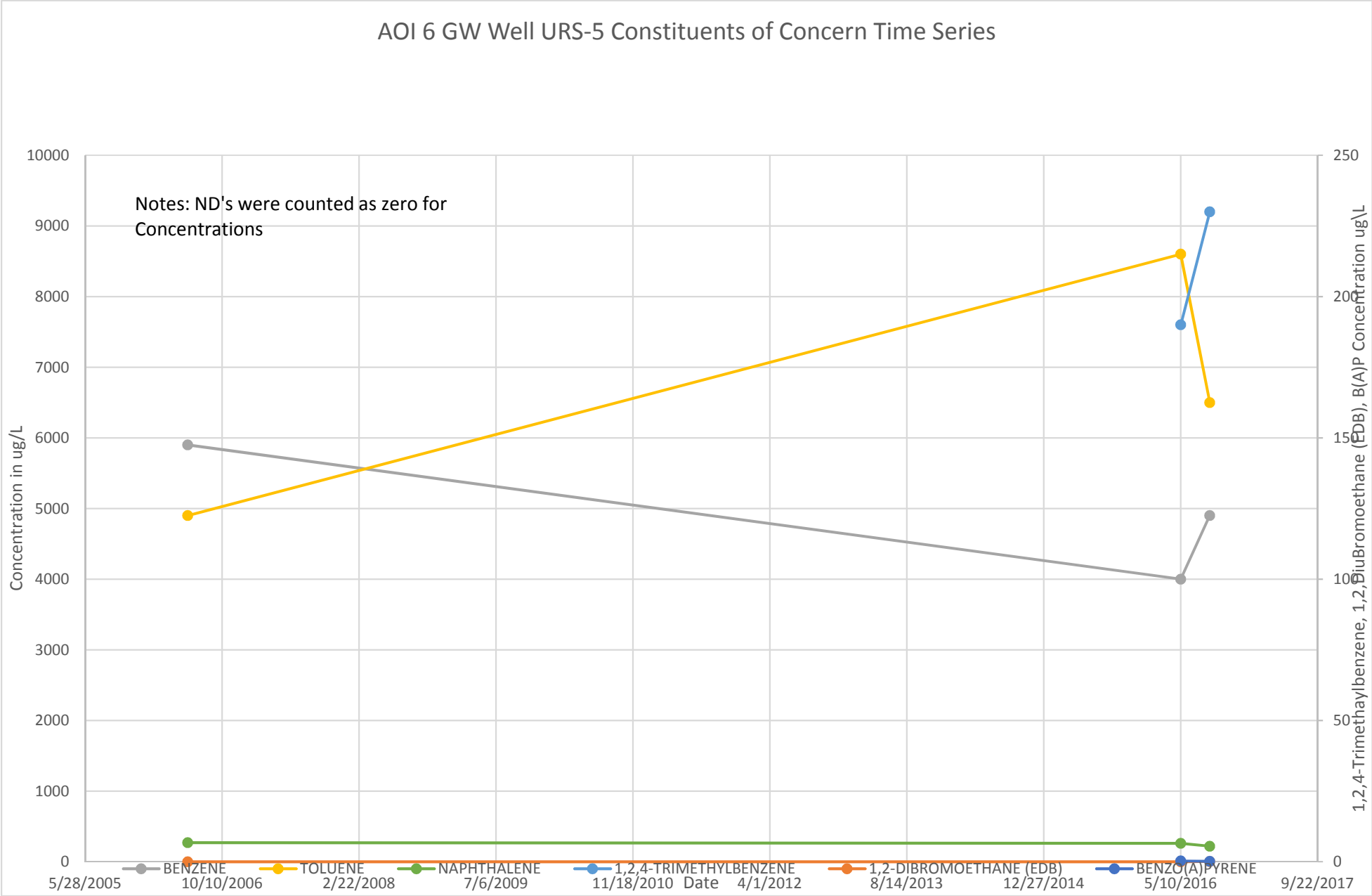

AOI 6 GW Well B-172 Constituents of Concern Time Series
Concentration in ug/L
B(A)P Contration in ug\L
180
160
140
120
100
80
60
40
20
0
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
4/20/2016
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
9/7/2016
Date
BENZENE
BENZO(A)PYRENE


AOI 6 GW Well B-173 Constituents of Concern Time Series
Concentration in ug/L
18
16
14
12
10
8
6
4
2
0
4/20/2016
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
9/7/2016
Date
BENZENE
BENZO(A)PYRENE


AOI 6 GW Well B-175 Constituents of Concern Time Series
Concentration in ug/L
Benzene Concentraiton ug\L
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
300
250
200
150
100
50
0
4/20/2016
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
9/7/2016
Date
BENZO(G,H,I)PERYLENE
BENZO(A)PYRENE
BENZENE


AOI 6 GW Well U-4 Constituents of Concern Time Series
Concentration in ug/L
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Notes: ND's were counted as zero for Concentrations
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date
BENZO(A)PYRENE
BENZO(G,H,I)PERYLENE
CHRYSENE


AOI 6 GW Well URS-3 Constituents of Concern Time Series
Notes: ND's were counted as zero for Concentrations
Concentration in ug/L
70
60
50
40
30
20
10
0
1/14/2004
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date
BENZO(A)ANTHRACENE
BENZO(A)PYRENE
BENZO(B)FLUORANTHENE
BENZO(G,H,I)PERYLENE
CHRYSENE


AOI 6 GW Well URS-5 Constituents of Concern Time Series
Notes: ND's were counted as zero for Concentrations
Concentration in ug/L
1,2,4-Trimethaylbenzene, 1,2,DiuBromoethane (EDB), B(A)P Concentration ug\L
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
250
200
150
100
50
0
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date
BENZENE
TOLUENE
NAPHTHALENE
1,2,4-TRIMETHYLBENZENE
1,2-DIBROMOETHANE (EDB)
BENZO(A)PYRENE

www.ghd.com

Appendix G
Remediation Systems Summary

Appendix G Remediation System Summary AOI 6 Remedial Investigation Report Philadelphia Refinery Operations

Consent Order/Characterization Status

AOI 6 was identified by Sunoco as the third area of the refinery to be investigated in accordance with the Phase II Corrective Action Schedule included in the CCR. A SCR for AOI 6 was submitted to the PADEP and the USEPA on September 29, 2006. A repackaged SCR/RIRp was submitted to the agencies on September 3, 2013. A “Disapproval of Remedial Investigation Report/Disapproval of Site Characterization Report” was received on November 27, 2013. A revised RIR will be completed in 2017.

Former 27 Pump House Remediation System (AOI 6)

System Description

The 27 Pump House Remediation System was a total fluids remediation system that was originally designed to provide hydraulic control of hydrocarbon impact resulting from historic petroleum refining operations. During November 2001, a LNAPL recovery system was installed at the former 27 Pump House. The system was started on December 4, 2001 with six recovery wells. Pneumatic total fluids pumps were installed in B-136, B-137, B-138, B-142, B-143, and SUMP-1. In January 2002, additional pumps were installed in B-133, B-134, B-139 and B-140 for a total of 10 recovery wells.

Total fluids (groundwater and LNAPL) were extracted from the system recovery wells by pneumatic submersible QED Environmental Systems AP-4 pumps utilizing air from a compressor. Total fluids were processed through an oil/water separator (OWS). The recovered groundwater was discharged to a refinery sewer for onsite treatment. The recovered LNAPL was stored in a 550-gallon holding tank that was periodically pumped out and recycled by the facility.

Operational History

Operation and maintenance activities included evaluation of the recovery well pumps, system equipment and associated level switches, and collection of the appropriate system performance data. The 27 Pump House Remediation System was monitored weekly during operation and the system was normally operational except for scheduled and unscheduled operational interruptions. System outages were due to repairs, cleaning, component upgrades, and operational faults. The system was susceptible to cold weather conditions and was not operational during prolonged freezing conditions.

The system was turned off September 20, 2010 due to the absence of recoverable product. Currently, the 27 Pump House Remediation System is not operating. The 27 Pump House Remediation System and passive LNAPL recovery activities recovered a total of approximately 11.1 million gallons of groundwater and 12,936 gallons of LNAPL to date (September 2017).

Passive Product Recovery

On September 28, 2010, absorbent socks were installed in some area wells and subsequently passive bailers were installed in select wells. Wells were routinely gauged and saturated absorbent socks and passive bailers were replaced or removed as needed. Due to the limited presence of LNAPL, passive recovery operations ended on January 26, 2015.

Appendix H
Data Usability Assessment

Memorandum

July 29, 2016

To:	David Steele	Ref. No.:	11109613
	PM		
From:	Paul McMahon/adh/1	Tel:	(716) 297-6150

Subject: **Data Usability Assessment**
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
April 2016

1. Introduction

This document details a data usability assessment of analytical results for soil samples collected on April 21-22, 2016 in support of the Solid Waste Management Unit (SWMU) Investigation AOI-6 at the Philadelphia Refinery Site in April 2016. Samples were submitted to Eurofins Lancaster Laboratories Environmental, located in Lancaster, Pennsylvania. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2. A copy of the executed chain of custody forms can be found in Attachment A.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, the chain of custody forms, blank data, duplicate data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike (MS) samples, and field quality assurance/quality control (QA/QC) samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 2 and applicable guidance from the documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", United States Environmental Protection Agency (USEPA) 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria and sample preservation requirements for the analyses are summarized in Table 2. The sample chain of custody documents and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

Inorganic Analyses

The method blank result was non-detect, indicating that laboratory contamination was not a factor for this investigation

4. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for organic determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral fraction is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. Most recoveries met the above criteria, demonstrating good analytical efficiency. One high volatile organic compound (VOC) surrogate recovery was reported; all associated detected results were qualified as estimated to reflect the indicated high bias (see Table 3).

5. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The RPD of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

The LCS or LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

Inorganic Analyses

The LCS contained the analyte of interest. The LCS recovery was assessed per the "Guidelines". The LCS recovery was within the control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, the data were judged acceptable based on the acceptable companion spike and RPD.

The laboratory performed site-specific MS/MSD analyses internally.

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits or met the above criteria, demonstrating acceptable analytical accuracy and precision.

7. Duplicate Sample Analyses – Inorganic Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory internally. The duplicate results were evaluated per the "Guidelines". All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8. ICP Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the Method Detection Limit [MDL]), the serial dilution results must agree within 10 percent of the original results.

For this study, no site-specific serial dilution samples were prepared and analyzed by the laboratory.

9. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample and three field duplicate sample sets.

Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, three field duplicate samples were collected and submitted "blind" to the laboratory. The RPDs associated with this duplicate sample must be less than 100 percent for soil samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is two times the RL value.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

10. Analyte Reporting

The laboratory reported detected results down to the laboratory's MDL for each analyte. Positive analyte detections less than the RL but greater than the MDL were qualified as estimated (J).

All soil results were reported on a dry weight basis.

11. Conclusion

Based on the assessment detailed in the foregoing, the data associated with this investigation are acceptable with the noted qualifications.

Table 1

Sample Collection and Analysis Summary
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
April 2016

Sample Identification	Location	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters			Comments
				VOCs	SVOCs	Lead	
AOI6-BH16-023-0-2-SOIL	AOI-6	04/21/2016	12:10	x	x	x	
AOI6-TB-BH16-04/21/2016	AOI-6	04/21/2016	12:48	x	x	x	
AOI6-BH16-021-0-2-SOIL	AOI-6	04/21/2016	13:21	x	x	x	
AOI6-BH16-020-0-2-SOIL	AOI-6	04/21/2016	14:30	x	x	x	
AOI6-BH16-019-0-2-SOIL	AOI-6	04/21/2016	15:15	x	x	x	
AOI6-BH16-DUP-SOIL-001	AOI-6	04/21/2016	15:25	x	x	x	Duplicate of AOI6-BH16-019-0-2-SOIL
AOI6-BH16-019-2-4-SOIL	AOI-6	04/21/2016	15:30	x	x	x	
AOI6-BH16-004-0-2-SOIL	AOI-6	04/21/2016	16:15	x	x	x	
AOI6-BH16-DUP-SOIL-002	AOI-6	04/21/2016	16:25	x	x	x	Duplicate of AOI6-BH16-004-0-2-SOIL
AOI6-BH16-004-2-4-SOIL	AOI-6	04/21/2016	16:36	x	x	x	
AOI6-BH16-006-0-2-SOIL	AOI-6	04/22/2016	9:40	x	x	x	
AOI6-BH16-006-2-4-SOIL	AOI-6	04/22/2016	9:52	x	x	x	
AOI6-BH16-025-0-2-SOIL	AOI-6	04/22/2016	12:10	x	x	x	
AOI6-BH16-DUP-04-22-16-003	AOI-6	04/22/2016	12:20	x	x	x	Duplicate of AOI6-BH16-025-0-2-SOIL
AOI6-BH16-025-2-4-SOIL	AOI-6	04/22/2016	12:40	x	x	x	
AOI6-BH16-026-0-2-SOIL	AOI-6	04/22/2016	14:35	x	x	x	

Notes:

VOCs - Volatile Organic Compounds
SVOCs - Seni-Volatile Organic Compounds

Table 2

Analytical Methods and Preservation Requirements
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
April 2016

Parameter	Method	Matrix	Preservation	Holding Time: Collection to Extraction (Days)	Holding Time: Collection or Extraction to Analysis (Days)
Volatile Organic Compounds (VOCs)	SW-846 8260B	Soil	Iced, 0-6° C	-	14
Semi-volatile Organic Compounds (SVOCs)	SW-846 8270C	Soil	Iced, 0-6° C	14	40
Lead	SW-846 6010	Soil	Iced, 0-6° C	-	180

Notes:

Method References:
SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
- - Not applicable

Table 3

Qualified Sample Data Due to Outlying of Surrogate Recoveries
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
April 2016

Parameter	Sample ID	Surrogate	Surrogate % Recovery	Control Limits % Recovery	Analyte	Qualified Result		Units
VOCs	AOI6-BH16-025-2-4-Soil	4-bromofluorobenzene	216	50-131	1,2,4-Trimethylbenzene	50000	J	µg/kg
					1,3,5-Trimethylbenzene	18000	J	µg/kg
					Benzene	1400000	J	µg/kg
					Ethylbenzene	61000	J	µg/kg
					Isopropyl benzene	2200000	J	µg/kg
					Toluene	640000	J	µg/kg
					Xylenes (total)	340000	J	µg/kg

Notes:

J - Estimated concentration
VOCs - Volatile organic compounds

Attachment A
Chain of Custody Forms

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1653975 Sample # ~~834970~~ 8349798-813 **COC # 496122**

OK 4/25/16

Client Information

Client: Evergreen 10177
Acct. #:
Project Name/#: Evergreen Philly 11109613
PWSID #:
Project Manager: David Steele
P.O. #:
Sampler: Alissa Connon
Quote #:
State where samples were collected: Pennsylvania
For Compliance: Yes ☐ No ☐

Matrix: Sediment ☐ Soil ☒ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other:

Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#:

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	VOC	Moisture (Load select VOCs)	Remarks
AOI6-BH16-023-0-2-Soil	4/21/16	1210	X		5			5	4	1	1 of 2
AOI6-TB-BH16-04/21/16	↓	1248	X					3			trip blank
AOI6-BH16-021-0-2-Soil		1321	X		X			5	4	1	
AOI6-BH16-020-0-2-Soil		1430	X		5			5	4	1	
AOI6-BH16-019-0-2-Soil		1515	X		5			5	4	1	
AOI6-BH16-DUP-Soil-001		1525	X		5			5	4	1	
AOI6-BH16-019-2-4-Soil		1530	X		5			5	4	1	
AOI6-BH16-004-0-2-Soil		1615	X		5			5	4	1	
AOI6-BH16-DUP-Soil-002		1625	X		5			5	4	1	
AOI6-BH16-004-2-4-Soil		1636	X		5			5	4	1	

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Relinquished by	Date	Time	Received by	Date	Time
Alissa Connon	4/22/16	1800	[signature]	4/25/16	0905
[signature]	4/25/16	1600			
			[signature]	4/25/16	1600

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No
If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.5 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1653975 Sample # 8349798-813

COC # 496121

Client Information

Client: Evergreen 10177
Acct. #:
Project Name/#: Evergreen Philly 1110913
PWSID #:
Project Manager: David Steele
P.O. #:
Sampler: Alissa Cannon
Quote #:
State where samples were collected: Pennsylvania
For Compliance: Yes ☐ No ☐

Matrix: Sediment ☐ Soil ☒ Water: Ground ☐ Potable ☐ Surface ☐ NPDES ☐ Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	VOCs	moisture, lead, selectivity									Remarks
AOI6-BH16-006-0-2-soil	4/22/16	0940	X		5			5	4	1									2 of 2
AOI6-BH16-006-2-4-soil		0952	X		5			5	4	1									
AOI6-BH16-025-0-2-soil		1210	X		5			5	4	1									
~~AOI6-BH16-TB-04-22-16-003~~		~~1220~~	~~X~~		~~5~~			~~5~~	~~4~~	~~1~~	AC								
AOI6-BH16-025-2-4-soil		1240	X		5			5	4	1									
AOI6-BH16-DUP-04-22-16-003		1220	X		5			5	4	1									
AOI6-BH16-026-0-2-soil			X		5			5	4	1									

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Alissa Cannon	4/22/16	1800	[signature]	4-25-16	0900
[signature]	4-25-16	1600			
			[signature]	4/25/16	1600

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 0.5 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 1115

Memorandum

August 4, 2016

To:	David Steele	Ref. No.:	11109613
	PM		
From:	Paul McMahon/adh/2	Tel:	716-297-6150

Subject: **Data Usability Assessment**
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
May 2016

1. Introduction

This document details a data usability assessment of analytical results for groundwater samples collected on May 9-10, 2016 in support of the Solid Waste Management Unit (SWMU) Investigation AOI-6 at the Philadelphia Refinery Site in May 2016. Samples were submitted to Eurofins Lancaster Laboratories Environmental, located in Lancaster, Pennsylvania. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2. A copy of the executed chain of custody forms can be found in Attachment A.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, the chain of custody forms, blank data, duplicate data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike (MS) samples, and field quality assurance/quality control (QA/QC) samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 2 and applicable guidance from the documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", United States Environmental Protection Agency (USEPA) 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria and sample preservation requirements for the analyses are summarized in Table 2. The sample chain of custody documents and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

3.1 Organic Analyses

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

3.2 Inorganic Analyses

The method blank result was non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for organic determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral fraction is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All recoveries met the above criteria, demonstrating good analytical efficiency.

5. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

5.1 Organic Analyses

The LCS or LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

5.2 Inorganic Analyses

The LCS contained the analyte of interest. The LCS recovery was assessed per the "Guidelines". The LCS recovery was within the control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

The laboratory performed site-specific MS/MSD analyses internally.

The MS/MSD samples were spiked with all analytes of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

7. Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory internally. The duplicate results were evaluated per the "Guidelines". All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8. ICP Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the method detection limit [MDL]), the serial dilution results must agree within 10 percent of the original results.

The serial dilution result was acceptable.

9. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample and one field duplicate sample set.

9.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

9.2 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, one field duplicate sample was collected and submitted "blind" to the laboratory. The RPDs associated with this duplicate sample must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criterion is one times the RL value.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

10. Analyte Reporting

The laboratory reported detected results down to the laboratory's MDL for each analyte. Positive analyte detections less than the RL but greater than the MDL were qualified as estimated (J).

11. Conclusion

Based on the assessment detailed in the foregoing, the data associated with this investigation are acceptable without qualification.

Table 1

Sample Collection and Analysis Summary
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
May 2016

Sample Identification	Location	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters: VOCs	SVOCs	EDB	Dissolved Lead	Comments
GW-11109613-B169-05-09-16-MM-024	AOI-6	05/09/2016	10:00	x	x	x	x	
GW-11109613-B152-05-09-16-AC-025	AOI-6	05/09/2016	12:10	x	x	x	x	
GW-11109613-URS4-05-09-16-MM-026	AOI-6	05/09/2016	14:00	x	x	x	x	
GW-11109613-DUP3-05-09-16-AC-027	AOI-6	05/09/2016	12:30	x	x	x	x	Duplicate of GW-11109613-B152-05-09-16-AC-025
GW-11109613-URS1-05-09-16-MM-028	AOI-6	05/09/2016	13:30	x	x	x	x	
GW-11109613-B145-05-09-16-AC-029	AOI-6	05/09/2016	13:15	x	x	x	x	
GW-11109613-URS3-05-09-16-MM-030	AOI-6	05/09/2016	15:35	x	x	x	x	
GW-11109613-B164-05-09-16-AC-031	AOI-6	05/09/2016	17:00	x	x	x	x	
GW-11109613-B125-05-09-16-MM-032	AOI-6	05/09/2016	17:30	x	x	x	x	
GW-11109613-B158-05-09-16-AC-033	AOI-6	05/09/2016	15:30	x	x	x	x	
TB-11109613-05-10-16-AC-034	AOI-6	05/10/2016	10:00	x	x	x	x	Trip Blank
GW-11109613-B126-05-10-16-MM-035	AOI-6	05/10/2016	9:45	x	x	x	x	

Notes:

VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
EDB - Ethylene Dibromide

Table 2

Analytical Methods and Preservation Requirements
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
May 2016

Parameter	Method	Matrix	Preservation	Holding Time	
				Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Volatile Organic Compounds (VOCs)	SW-846 8260B	Groundwater	pH < 2 and Iced, 0-6° C	-	14
Semi-volatile Organic Compounds (SVOCs)	SW-846 8270C	Groundwater	Iced, 0-6° C	7	40
Ethylene Dibromide (EDB)	SW-846 8011	Groundwater	Iced, 0-6° C	-	14
Dissolved Lead	SW-846 6020	Groundwater	pH < 2 and Iced, 0-6° C	-	180

Notes:

Method References:
SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
- - Not applicable

Attachment A
Chain of Custody Forms

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1659064 Sample # 8373129-40

COC # 500119

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philly / 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cameron

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate

N=HNO_3 B=NaOH

S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix: Soil	Sediment	Tissue	Water: Potable	Ground	Surface	NPDES	Other	Total # of Containers	Lead	Select VOCs 8260	Select SVOCs 8270 SIM	EDB Soil	Remarks
GW-11109613-B169-05-09-16-MM-024	5-09-16	1000	X					X					8	1	3	2	2	
GW-11109613-B152-05-09-16-AC-025		1210	X					X					8	1	3	2	2	
GW-11109613-URS4-05-09-16-MM-026		1400	X					X					8	1	3	2	2	
GW-11109613-DUP3-05-09-16-AC-027		1230	X					X					8	1	3	2	2	
GW-11109613-URS1-05-09-16-MM-028		1330	X					X					8	1	3	2	2	
GW-11109613-B145-05-09-16-AC-029		1315	X					X					9	2	3	2	2	QAQC
GW-11109613-URS3-05-09-16-MM-030		1535	X					X					8	1	3	2	2	
GW-11109613-B164-05-09-16-AC-031		1700	X					X					8	1	3	2	2	
GW-11109613-B125-05-09-16-MM-032		1730	X					X					8	1	3	2	2	
GW-11109613-B158-05-09-16-AC-033		1530	X					X					8	1	3	2	2	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	5-10-16	1045	[signature]	5-10-16	1045
[signature]	5-10-16	1601			
			[signature]	5-10-16	1605

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 16.2.4 °C

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1659064 Sample # 8373129-40

COC # 499227

Client Information

Client: Evergreen

Acct. #:

Project Name/#: Evergreen Philly

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: Alissa Cannon

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#: 187581

Matrix

Sediment ☐ Soil ☐ Potable ☐ Ground ☒ Water ☐ NPDES ☐ Surface ☐ Other: ____

Analysis Requested / Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	Lead	Select VOCs 8260	Select SVOCs 8270SIM	EDB 8011	Remarks
TB-11109613-05-10-16-AG-034	05-10-16	1000			4		2		2	
GW-11109613-BLK-05-10-16-MM-035	05/10/16	0945	X		8	1	3	2	2	3 Select VOCs 8260 AC

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	4-14-16	0918			
	5-10-16	1045		5-10-16	1045
	5-10-16	1605			
				5-10-16	1605

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

EDD Required? Yes No

If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS ____ FedEx ____ Other ____

Temperature upon receipt 1.6-2.4°C

Memorandum

October 7, 2016

To:	David Steele	Ref. No.:	11109613
From:	Paul McMahon/cs/1 PM	Tel:	716-205-1970

Subject: **Data Usability Assessment**
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

1. Introduction

This document details a data usability assessment of analytical results for groundwater samples collected on August 22-23, 2016 in support of the Solid Waste Management Unit (SWMU) Investigation AOI-6 at the Philadelphia Refinery Site. Samples were submitted to Eurofins Lancaster Laboratories Environmental, located in Lancaster, Pennsylvania. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2. A copy of the executed chain of custody forms can be found in Attachment A.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, the chain of custody forms, blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes, and field quality assurance/quality control (QA/QC) samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 2 and applicable guidance from the documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", United States Environmental Protection Agency (USEPA) 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria and sample preservation requirements for the analyses are summarized in Table 2. The sample chain of custody documents and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

Inorganic Analyses

The method blank result was non-detect, indicating that laboratory contamination was not a factor for this investigation

4. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for organic determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of semi-volatile organic compound (SVOC) analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral fraction is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. Most recoveries met the above criteria, demonstrating good analytical efficiency. One high ethylene dibromide surrogate recovery was reported; the associated sample result was non-detect and was not impacted by the indicated high bias.

5. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

The LCS/LCSD contained all compounds of interest. Most LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision. Three low SVOC recoveries were reported, and the associated sample results were qualified as estimated to reflect the potential low bias (see Table 3).

Inorganic Analyses

The LCS contained the analyte of interest. The LCS recovery was assessed per the "Guidelines". The LCS recovery was within the control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, the data were judged acceptable based on the acceptable companion spike and RPD.

Organic Analyses

The MS/MSD samples were spiked with the compounds of interest. The percent recoveries and RPDs were within the control limits, demonstrating acceptable analytical accuracy and precision.

Inorganic Analyses

The MS/MSD sample was spiked with the analyte of interest, and the results were evaluated using the "Guidelines". The percent recoveries and RPD were within the control limits, demonstrating acceptable analytical accuracy and precision.

7. Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory internally. The duplicate results were evaluated per the "Guidelines". All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8. ICP Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the Method Detection Limit [MDL]), the serial dilution results must agree within 10 percent of the original results.

A serial dilution was performed on the MS sample. All results met the criteria above.

9. Field QA/QC Samples

The field QA/QC consisted of two trip blank samples and one field duplicate sample set.

9.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, two trip blanks were submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

9.2 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, one field duplicate sample was collected and submitted "blind" to the laboratory. The RPDs associated with this duplicate sample must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value.

Variability was observed in some of the SVOC results, and the associated sample data were qualified as estimated (see Table 4).

10. Analyte Reporting

The laboratory reported detected results down to the laboratory's MDL for each analyte. Positive analyte detections less than the reporting limit (RL) but greater than the MDL were qualified as estimated (J).

11. Conclusion

Based on the assessment detailed in the foregoing, the data associated with this investigation are acceptable with the noted qualifications.

Table 1

Sample Collection and Analysis Summary
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Sample Identification	Location	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters			Comments
				VOCs	SVOCs	Lead	
GW-11109613-B-169-082216-KC-001	B-169	08/22/2016	09:24	x	x	x	
GW-11109613-B-158-082216-AC-002	B-158	08/22/2016	10:25	x	x	x	
GW-11109613-B-170-082216-KC-003	B-170	08/22/2016	11:40	x	x	x	
GW-11109613-U-4-082216-AC-004	U-4	08/22/2016	14:35	x	x	x	
GW-11109613-B-43-082216-KC-005	B-43	08/22/2016	12:35	x	x	x	
GW-11109613-B-117-082216-AC-006	B-117	08/22/2016	15:26	x	x	x	
GW-11109613-B-174-082216-KC-007	B-174	08/22/2016	14:28	x	x	x	
TB-11109613-082216-AC-01	-	08/22/2016	-	x			Trip Blank
GW-11109613-B-126-082316-KC-008	B-126	08/23/2016	08:46	x	x	x	
GW-11109613-B-172-082316-AC-009	B-172	08/23/2016	08:45	x	x	x	
GW-11109613-B-125-082316-KC-010	B-125	08/23/2016	09:17	x	x	x	
GW-11109613-B-172D-082316-AC-011	B-172	08/23/2016	08:55	x	x	x	Duplicate of GW-11109613-B-172-082316-AC-009
GW-11109613-B-173-082316-KC-012	B-173	08/23/2016	11:29	x	x	x	
GW-11109613-URS-1-082316-AC-013	URS-1	08/23/2016	12:05	x	x	x	
GW-11109613-B-164-082316-KC-014	B-164	08/23/2016	12:03	x	x	x	
GW-11109613-B-175-082316-AC-015	B-175	08/23/2016	15:20	x	x	x	
TB-11109613-082316-AC-02	-	08/23/2016	-	x			Trip Blank

Notes:

VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds
\- - Not applicable

Table 2

Analytical Methods and Preservation Requirements
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Parameter	Method	Matrix	Preservation	Holding Time: Collection to Extraction (Days)	Holding Time: Collection or Extraction to Analysis (Days)
Volatile Organic Compounds (VOCs)	SW-846 8260B	Groundwater	pH < 2 and Iced, 0-6° C	-	14
Semi-volatile Organic Compounds (SVOC	SW-846 8270C	Groundwater	Iced, 0-6° C	7	40
Ethylene Dibromide (EDB)	SW-846 8011	Groundwater	Iced, 0-6° C	-	14
Dissolved Lead	SW-846 6020	Groundwater	pH < 2 and Iced, 0-6° C	-	180

Notes:

Method References:
SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
- - Not applicable

Table 3

Qualified Sample Results Due to Outlying Laboratory Control Sample Results
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Parameter	Analyte	LCS Date (mm/dd/yyyy)	LCS % Recovery	Control Limits % Recovery	Associated Sample ID	Qualified Results	Units
SVOCs	Benzo(a)pyrene	08/26/16	64	66-111	GW-11109613-B-169-082216-KC-001	0.015 J	µg/L
					GW-11109613-B-158-082216-AC-002	0.042 J	µg/L
					GW-11109613-B-170-082216-KC-003	0.043 J	µg/L
					GW-11109613-U-4-082216-AC-004	2.7 J	µg/L
					GW-11109613-B-43-082216-KC-005	0.66 J	µg/L
					GW-11109613-B-117-082216-AC-006	0.19 J	µg/L
					GW-11109613-B-174-082216-KC-007	0.060 J	µg/L
					GW-11109613-B-126-082316-KC-008	0.39 J	µg/L
					GW-11109613-B-172-082316-AC-009	0.18 J	µg/L
					GW-11109613-B-125-082316-KC-010	0.040 J	µg/L
					GW-11109613-B-172D-082316-AC-011	0.092 J	µg/L
					GW-11109613-B-173-082316-KC-012	0.51 J	µg/L
					GW-11109613-URS-1-082316-AC-013	0.053 UJ	µg/L
					GW-11109613-B-164-082316-KC-014	0.019 J	µg/L
					GW-11109613-B-175-082316-AC-015	0.22 J	µg/L
SVOCs	Benzo(b)fluoranthene	08/26/16	68	69-117	GW-11109613-B-169-082216-KC-001	0.020 J	µg/L
					GW-11109613-B-158-082216-AC-002	0.046 J	µg/L
					GW-11109613-B-170-082216-KC-003	0.044 J	µg/L
					GW-11109613-U-4-082216-AC-004	1.1 J	µg/L
					GW-11109613-B-43-082216-KC-005	0.75 J	µg/L
					GW-11109613-B-117-082216-AC-006	0.23 J	µg/L
					GW-11109613-B-174-082216-KC-007	0.065 J	µg/L
					GW-11109613-B-126-082316-KC-008	0.39 J	µg/L
					GW-11109613-B-172-082316-AC-009	0.18 J	µg/L
					GW-11109613-B-125-082316-KC-010	0.046 J	µg/L
					GW-11109613-B-172D-082316-AC-011	0.094 J	µg/L
					GW-11109613-B-173-082316-KC-012	0.55 J	µg/L
					GW-11109613-URS-1-082316-AC-013	0.053 UJ	µg/L
					GW-11109613-B-164-082316-KC-014	0.021 J	µg/L
					GW-11109613-B-175-082316-AC-015	0.27 J	µg/L
SVOCs	Benzo(g,h,i)perylene	08/26/16	45	56-115	GW-11109613-B-169-082216-KC-001	0.016 J	µg/L
					GW-11109613-B-158-082216-AC-002	0.027 J	µg/L
					GW-11109613-B-170-082216-KC-003	0.020 J	µg/L
					GW-11109613-U-4-082216-AC-004	2.4 J	µg/L
					GW-11109613-B-43-082216-KC-005	0.32 J	µg/L
					GW-11109613-B-117-082216-AC-006	0.13 J	µg/L
					GW-11109613-B-174-082216-KC-007	0.034 J	µg/L
					GW-11109613-B-126-082316-KC-008	0.14 J	µg/L
					GW-11109613-B-172-082316-AC-009	0.085 J	µg/L
					GW-11109613-B-125-082316-KC-010	0.012 J	µg/L

Table 3

Qualified Sample Results Due to Outlying Laboratory Control Sample Results
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Parameter	Analyte	LCS Date (mm/dd/yyyy)	LCS % Recovery	Control Limits % Recovery	Associated Sample ID	Qualified Results	Units
SVOCs	Benzo(g,h,i)perylene	08/26/16	45	56-115	GW-11109613-B-172D-082316-AC-011	0.041 J	µg/L
					GW-11109613-B-173-082316-KC-012	0.12 J	µg/L
					GW-11109613-URS-1-082316-AC-013	0.053 UJ	µg/L
					GW-11109613-B-164-082316-KC-014	0.018 J	µg/L
					GW-11109613-B-175-082316-AC-015	0.096 J	µg/L

Notes:

LCS - Laboratory Control Sample
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated

Table 4

Qualified Sample Results Due to Variability in Field Duplicate Results
SWMU Investigation AOI-6 Groundwater
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Parameter	Analyte	RPD	Sample ID	Qualified Result		Field Duplicate Sample ID	Qualified Result		Units
SVOCs	Anthracene	107	GW-11109613-B-172-082316-AC-009	0.33	J	GW-11109613-B-172D-082316-AC-011	0.10	J	µg/L
	Benzo(a)anthracene	70		0.27	J		0.13	J	µg/L
	Benzo(a)pyrene	65		0.18	J		0.092	J	µg/L
	Benzo(b)fluoranthene	63		0.18	J		0.094	J	µg/L
	Fluorene	84		0.56	J		0.23	J	µg/L
	Phenanthrene	151		0.26	J		0.036	J	µg/L

Notes:

RPD - Relative Percent Difference
J - Estimated concentration
SVOCs - Semi-volatile organic compounds

ATTACHMENT A

CHAIN OF CUSTODY DOCUMENTATION

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1699628 Sample # 8548677-93

1 of 2

COC # 507704

Client Information

Client: Evergreen / GHD

Acct. #:

Project Name/#: Evergreen PES 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon / K Curry

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other:

Analysis Requested — Preservation Codes

For Lab Use Only

FSC:

SCR#: 193095

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Water	Ground	Potable	NPDES	Surface	Other	Total # of Containers	Lead (Field Filtered)	EDB in Wastewater	BTEX/MTBE/Cumene/EDC/TMBs	PAHs in waters by SIM	Metals QC	Remarks
GW-11109613-B-169-082216-KC-001	08/23/16	0924	8					8						8	1	2	3	2		Philadelphia Database
GW-11109613-B-158-082216-AC-002		1025	8					8						8	1	2	3	2		
GW-11109613-B-170-082216-KC-003		1140	8					8						8	1	2	3	2		
GW-11109613-U-4-082216-AC-004		1435	8					8						8	1	2	3	2		
GW-11109613-B-43-082216-KC-005		1235	8					8						8	1	2	3	2		
GW-11109613-B-117-082216-AC-006		1526	8					8						8	1	2	3	2		
GW-11109613-B-174-082216-KC-007		1428	8					8						8	1	2	3	2		
TB-11109613-082216-AC-01		1600											4	4		2	2	~~2~~ NC		Trip Blanks
GW-11109613-B-126-082316-KC-008	08/23/16	0846	~~8~~ 9					~~8~~ 9					9	~~8~~ 9	1	2	3	2	1	
GW-11109613-B-172-082316-AC-009		0845	8					8						8	1	2	3	2		

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	8.17.16	820	[signature]	8.17.16	820
[signature]	8.17.16				
[signature]	8/23/16	1700	[signature]	8.23.16	13:08
[signature]	8.24.16	1553			
			[signature]	8.24.16	1553

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.2-1.7 °C

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 10177 Group # 1699628 Sample # 8548677-93

2 of 2 **COC #** 507703

Client Information

Client: Evergreen / GHD

Acct. #:

Project Name/#: Evergreen PES / 11109613

PWSID #:

Project Manager: David Steele

P.O. #:

Sampler: A. Cannon / K. Corry

Quote #:

State where samples were collected: Pennsylvania

For Compliance: Yes ☐ No ☐

For Lab Use Only

FSC:

SCR#:

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	Water	Surface	NPDES	Other:	Total # of Containers	Lead (Field Filtered)	EDB in wastewater	BTEX/MTBE/Lumped EDC/TMB	PAH, in wastewater SIM	Metals QC	Remarks
GW-11109613-B-125-082316-KC-010	08/23/16	0917	8						8					8	1	2	3	2		Philadelphia Database
GW-11109613-B-172D-082316-AC-011		0855	8						8					8	1	2	3	2		
~~GW-11109613-B-173-082316-KC-012~~	AC	1129																		
GW-11109613-B-173-082316-KC-012		1129	8						8					8	1	2	3	2		
GW-11109613-MRS-1-082316-AC-013		1205	9						9					9	1	2	3	2	1	
GW-11109613-B-164-082316-KC-014		1203	8						8					8	1	2	3	2		
GW-11109613-B-175-082316-AC-015		1520	8						8					8	1	2	~~3~~ 3	2		
TB-11109613-082316-AC-02		1600	4										4	4		2	2			

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	8/24/16	710	[signature]	8.24.16	1310
[signature]	8.24.16	1553	[signature]		
			[signature]	8-24-16	1553

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.2-1.7 °C

Memorandum

September 15, 2016

To:	David Steele	Ref. No.:	11109613
	PM		
From:	Paul McMahon/adh/3	Tel:	716-205-1970

Subject: **Data Usability Assessment**
SWMU Investigation AOI-6 Air
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

1. Introduction

This document details a data usability assessment of analytical results for air samples collected on August 25, 2016 in support of the Solid Waste Management Unit (SWMU) Investigation AOI-6 at the Philadelphia Refinery Site. Samples were submitted to Eurofins Lancaster Laboratories Environmental, located in Lancaster, Pennsylvania. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2. A copy of the executed chain of custody form can be found in Attachment A.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, the chain of custody form, blank data, and recovery data from laboratory control samples (LCS).

The Quality Assurance/Quality Control (QA/QC) criteria by which these data have been assessed are outlined in the analytical method referenced in Table 2 and applicable guidance from the "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", United States Environmental Protection Agency (USEPA) 540 R 08 01, June 2008.

2. Sample Holding Time and Preservation

The sample holding time criterion for the analyses is summarized in Table 2. The sample chain of custody document and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding time.

3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of one per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Laboratory Control Sample Analyses

LCS and laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS/LCSD were analyzed at a minimum frequency of one per analytical batch.

The LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

5. Analyte Reporting

The laboratory reported detected results down to the laboratory's Method Detection Limit (MDL) for each analyte. Positive analyte detections less than the reporting limit (RL) but greater than the MDL were qualified as estimated (J).

6. Conclusion

Based on the assessment detailed in the foregoing, the data associated with this investigation are acceptable without qualification.

Table 1

Sample Collection and Analysis Summary
SWMU Investigation AOI-6 Air
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (Start) (hr:min)	Collection Time (Stop) (hr:min)	Analysis/Parameters: VOCs
AOI6-AA16-001	AOI6-AA-16-001	Air	08/25/2016	07:14	16:21	X
AOI6-AA16-002	AOI6-AA-16-002	Air	08/25/2016	07:33	16:32	X
AOI6-AA16-003	AOI6-AA-16-003	Air	08/25/2016	07:47	16:41	X

Notes:

VOCs - Volatile Organic Compounds

Table 2

Analytical Method and Holding Time Criterion
SWMU Investigation AOI-6 Air
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
August 2016

Parameter	Method	Matrix	Holding Time Collection to Analysis (Days)
Volatile Organic Compounds (VOCs)	TO-15	Air	30

Notes:

EPA Method TO-15 - "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999
VOCs - Volatile Organic Compounds

Attachment A
Chain of Custody Form

Summa Canister Field Test Data/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only: Acct. # 10177 Group # 1700658 Sample # 8553153-55 Bottle Order (SCR) #

Client Information

Client: Evergreen / GHD
Account #:
Project Name/#: Evergreen PES Philadelphia 11109613
Project Manager: David Steele
P.O. #:
Sampler: Alissa Cannon
Quote #:
Name of state where samples were collected: Pennsylvania

Turnaround Time Requested (TAT) (circle one)

Standard Rush (specify) _____

Data Package Required? Yes No

EDD Required? Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient				
Maximum				
Minimum				

Analyses Requested

☐ MTBE ☐ BTEX

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	~~Interior~~ Outdoor Temp. (F) (Start)	~~Interior~~ Outdoor Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
A0I6-AA16-001	08/25/2016 0714	08/25/2016 1631	-30	-03	69°	85°	303423	1023	6	10.2						
A0I6-AA16-002	08/25/2016 0733	08/25/2016 1632	-30	-05	68°	85°	930827	1118	6	10.3						
A0I6-AA16-003	08/25/2016 0747	08/25/2016 1641	-30	-04+	71°	85°	399408	1202	6	10.3						

Instructions/QC Requirements & Comments

Philadelphia Database

EPA 25 (check one): ☐ C1 - C4 ☐ C2 - C10 ☐ C1 - C10 ☐ C4 - C10 (GRO) ☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
16.00	8/16/16						
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
	8/26/2016 1200	A. [illegible]	8/26/16 1225	A. [illegible]	8/26/16 1915		
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
						E. [illegible]	8/26/16 1915

Memorandum

January 26, 2017

To:	David Steele	Ref. No.:	11109613
	PM		
From:	Paul McMahon/adh/5	Tel:	716-205-1970

Subject: **Data Usability Assessment**
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
January 2017

1. Introduction

This document details a data usability assessment of analytical results for soil samples collected on January 6, 2017 in support of the Solid Waste Management Unit (SWMU) Investigation AOI-6 at the Philadelphia Refinery Site. Samples were submitted to Eurofins Lancaster Laboratories Environmental, located in Lancaster, Pennsylvania. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2. A copy of the executed chain of custody form can be found in Attachment A.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, the chain of custody form, blank data, and recovery data from laboratory control samples (LCS).

The Quality Assurance/Quality Control (QA/QC) criteria by which these data have been assessed are outlined in the analytical method referenced in Table 2 and applicable guidance from the document entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", United States Environmental Protection Agency (USEPA) 540-R-10-011, January 2010

Item i) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criterion and sample preservation requirements for the analyses are summarized in Table 2. The sample chain of custody document and analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding time.

All samples were delivered on ice and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation

4. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained the analyte of interest. The LCS recoveries were assessed per the "Guidelines". The LCS recoveries were within the control limits, demonstrating acceptable analytical accuracy.

5. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, the data were judged acceptable based on the acceptable companion spike and RPD.

The laboratory did not perform site-specific MS/MSD analyses internally for this sample delivery group (SDG).

6. ICP Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the Method Detection Limit [MDL]), the serial dilution results must agree within 10 percent of the original results.

For this study, no site-specific serial dilution samples were prepared and analyzed by the laboratory.

7. Analyte Reporting

The laboratory reported detected results down to the laboratory's MDL for each analyte. There were no positive analyte detections less than the reporting limit (RL) but greater than the MDL.

All soil results were reported on a dry weight basis.

8. Conclusion

Based on the assessment detailed in the foregoing, the data associated with this investigation are acceptable without qualification.

Table 1

Sample Collection and Analysis Summary
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
January 2017

				Analysis/Parameters
Sample Identification	**Location**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**Lead**
AOI6-BH-17-001-0-2-SOIL	AOI6	01/06/2017	13:00	X
AOI6-BH-17-002-0-2-SOIL	AOI6	01/06/2017	13:36	X
AOI6-BH-17-003-0-2-SOIL	AOI6	01/06/2017	8:42	X
AOI6-BH-17-004-0-2-SOIL	AOI6	01/06/2017	9:20	X
AOI6-BH-17-005-0-2-SOIL	AOI6	01/06/2017	10:36	X
AOI6-BH-17-009-0-2-SOIL	AOI6	01/06/2017	12:06	X

Notes:

SWMU - Solid Waste Management Unit

Table 2

Analytical Methods and Preservation Requirements
SWMU Investigation AOI-6 Soil
Evergreen Resources Group, LLC
Philadelphia, Pennsylvania
January 2017

Parameter	Method	Matrix	Preservation	Collection to Analysis (Days)
Lead	SW-846 6010B	Soil	Iced, 0-6° C	180

Notes:

SWMU - Solid Waste Management Unit

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Attachment A
Chain of Custody Form

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

3 1/6/17 1477

For Eurofins Lancaster Laboratories Environmental use only

Acct. # ~~1011~~ Group # 1751531 Sample # 8776339-48

COC # 518255

Client Information

Client: GHD	Acct. #:
Project Name/#: Evergreen PES AOI6	PWSID #:
Project Manager: David Steele	P.O. #:
Sampler: Kevin Curry	Quote #: 11109613-001
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

Matrix: Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: ____

Analysis Requested — Preservation Codes

For Lab Use Only
FSC: ____
SCR#: 199780

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	Lead by SW-846 6010	Remarks
AOI6-BH-17-03-0-2-SOIL	1/6/17	842	X					1	X	
AOI6-BH-17-04-0-2-SOIL	1/6/17	920	X					1	X	
AOI6-BH-17-08-0-2-SOIL	1/6/17	958	X					1	X	HOLD
AOI6-BH-17-05-0-2-SOIL	1/6/17	1036	X					1	X	
AOI6-BH-17-10-0-2-SOIL	1/6/17	1124	X					1	X	HOLD
AOI6-BH-17-09-0-2-SOIL	1/6/17	1206	X					1	X	HOLD
AOI6-BH-17-06-0-2-SOIL	1/6/17	1234	X					1	X	HOLD
AOI6-BH-17-02-0-2-SOIL	1/6/17	1303	X					1	X	
AOI6-BH-17-01-0-2-SOIL	1/6/17	1326	X					1	X	
AOI6-BH-17-07-0-2-SOIL	1/6/17	1336	X					1	X	HOLD

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: 3days

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	1/3/18	0920			
[signature]	1/6/17	1715			
			[signature]	1/6/17	1715

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)
Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13
NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No
If yes, format: GHD EQUIS, Statec EDDs

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt 0.8 °C

Appendix I
Ecological Assessment Documentation

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
814-359-5237

November 3, 2016

IN REPLY REFER TO
SIR# 46837

GHD
Alissa Cannon
410 Eagleview Blvd.
Exton, Pennsylvania 19341

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 613655_1
PES AOI 6
PHILADELPHIA County: Philadelphia City

Dear Alissa Cannon:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Robert Morgan at 814-359-5129 and refer to the SIR # 46837. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/RTM/dn

1. PROJECT INFORMATION

Project Name: **PES AOI 6**
Date of Review: **10/21/2016 01:28:44 PM**
Project Category: **Hazardous Waste Clean-up, Site Remediation, and Reclamation, Other**
Project Area: **118.66 acres**
County(s): **Philadelphia**
Township/Municipality(s): **PHILADELPHIA**
ZIP Code: **19145**
Quadrangle Name(s): **PHILADELPHIA**
Watersheds HUC 8: **Schuylkill**
Watersheds HUC 12: **City of Philadelphia-Schuylkill River**
Decimal Degrees: **39.902206, -75.208592**
Degrees Minutes Seconds: **39° 54' 7.9426" N, 75° 12' 30.9303" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) must comply with the bog turtle habitat screening requirements of the PASPGP.

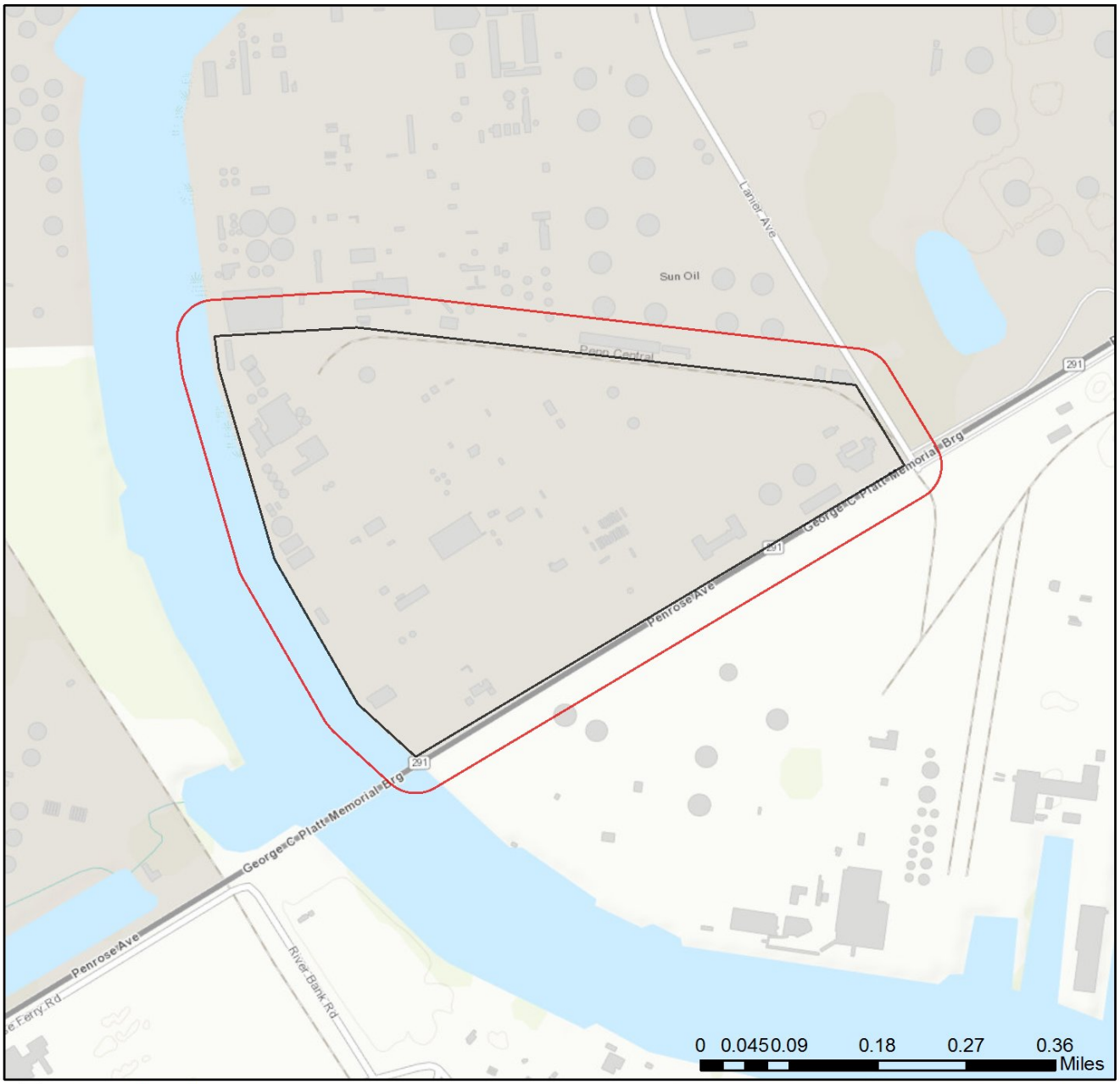
PES AOI 6

Project Boundary

Buffered Project Boundary

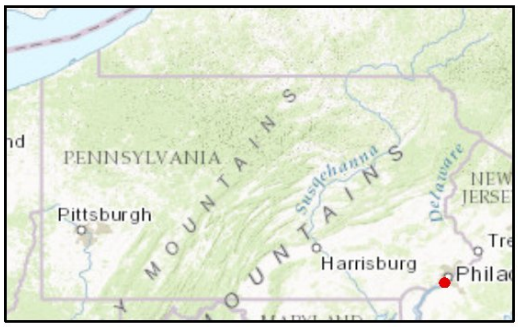
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user

PES AOI 6



Project Boundary

Buffered Project Boundary



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Endangered
Sensitive Species**		Endangered
Sensitive Species**		Threatened
Sensitive Species**		Endangered

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).
***Note:** U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Alissa Cannon
Company/Business Name: GHD
Address: 410 Eagleview Blvd. Suite 110
City, State, Zip: Exton, PA, 19341
Phone: (610) 321-1800 Fax: (610) 321-2763
Email: alissa.cannon@ghd.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Alissa Cannon
applicant/project proponent signature

October 25, 2016
date

Appendix J
Copies of Referenced Consultant Reports (on CD)

Appendix K
Historical Data

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-39					B-43		B-45									B-46				B-48			
Sample Date			8-Jan-13	8-Jan-13	11-May-16	24-Aug-16	24-Aug-16	23-May-16	22-Aug-16	25-May-05	10-Nov-05	8-Jun-06	18-Dec-07	4-Nov-08	4-Nov-08	7-Jan-13	7-Jan-13	5-May-16	25-May-05	7-Jun-06	7-Jan-13	7-Jan-13	24-May-05	8-Jun-06	4-Jan-13	4-Jan-13
Sample ID			839_010813	839_010813	GW-11109613-839-05-11-16-MM-043	GW-11109613-8-39-082416-AC-022	GW-11109613-8-39-082416-KC-023	B-43-20160523	GW-11109613-B-43-082216-KC-005	845-052505	B-45_11_10_2005	B45-060806	B-45	B-45	B-45_110408	B-45_010713	B-45_010713	GW-11109613-845-05-05-16-RM-014	846-052505	846-060706	846_010713	846_010713	848-052405	848-060806	848_010413	848_010413
Sampling Company			UNKNOWN	UNKNOWN	GHD	GHD	GHD	STANTEC	GHD	--	--	--	--	--	--	UNKNOWN	UNKNOWN	GHD	--	--	UNKNOWN	UNKNOWN	--	--	UNKNOWN	UNKNOWN
Laboratory			ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	--	--	--	--	--	--	ACCUTEST	ACCUTEST	LL	--	--	ACCUTEST	ACCUTEST	--	--	ACCUTEST	ACCUTEST
Laboratory Work Order			J825964	J825964	1660120	1700681	1700681	1666456	1699628	UNKNOWN	UNKNOWN	UNKNOWN	20140718EZ	20140718EZ	1118614	J825835	J825835	1658374	UNKNOWN	UNKNOWN	J825834	J825834	UNKNOWN	UNKNOWN	J825729	J825729
Laboratory Sample ID	Units	MSC-PA	J825964-4	J825964-4F	8378039	8553514	8553515	8402590	8548681	4532836	46746-36	4790619	UNKNOWN	UNKNOWN	5519539	J825835-10	J825835-10F	8370269	4532837	4789402	J825834-5	J825834-5F	4532027	4790621	J825729-4	J825729-4F
Field Parameters																										
CONDUCTIVITY	mS/cm	n/v	-	-	NM	-	-	-	0.34	-	-	-	-	-	-	-	-	3.48	-	-	-	-	-	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	NM	-	-	3.08	15.08	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	NM	-	-	-138	-135	-	-	-	-	-	-	-	-	-140	-	-	-	-	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	NM	-	-	7.69	7.84	-	-	-	-	-	-	-	-	7.16	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	0.376	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	NM	-	-	18.37	25.7	-	-	-	-	-	-	-	-	12.6	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	0.245	-	-	-	-	0.644	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	NM	-	-	89.2	378	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Volatile Organic Compounds																										
BENZENE	µg/L	5	***44.0 (1.0)***	-	3 (0.5)	4 (0.5)	3 (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (0.5)	3 (1)	ND (5) (0.5)	ND (0.5)	-	ND (0.5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	ND (0.0097)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (1) (1)	ND (5) (1)	ND (0.5)	-	ND (0.5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-
ETHYLBENZENE	µg/L	700	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (0.8)	1 (1)	ND (5) (0.8)	ND (0.5)	-	ND (0.5) (0.8)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	2.0 (1.0)	-	ND (5) (0.8)	ND (5) (0.8)	2.0 (1.0)	-
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	12 (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	30.1 (2.0)	-	11 (0.5)	26 (0.5)	17 (0.5)	4 (0.5)	6 (0.5)	5 (1)	-	ND (5) (1)	ND (0.5)	-	ND (0.5) (1)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (5) (1)	ND (5) (1)	ND (2.0) (2.0)	-	ND (5) (1)	ND (5) (1)	ND (2.0) (2.0)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (1)	ND (5) (0.5)	-	-	ND (0.5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-
TOLUENE	µg/L	1000	3.1 (1.0)	-	0.7 J (0.5)	2 (0.5)	2 (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (0.7)	ND (1) (1)	ND (5) (0.7)	ND (0.5)	-	ND (0.5) (0.7)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	ND	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	ND (2.0) (2.0)	-	ND (2) (0.5)	1 J (0.5)	0.6 J (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	-	-	-	-	-	ND (0.5) (1)	ND (2.0) (2.0)	-	ND (2) (0.5)	-	-	3.7 (2.0)	-	-	-	3.7 (2.0)	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	-	-	-	-	-	ND (0.5) (1)	ND (2.0) (2.0)	-	ND (2) (0.5)	-	-	ND (2.0) (2.0)	-	-	-	ND (2.0) (2.0)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	3.8 (1.0)	-	4 (0.5)	5 (0.5)	4 (0.5)	ND (0.5) (0.5)	0.6 J (0.5)	ND (5) (0.8)	8 (1)	ND (5) (0.8)	ND (0.5)	-	ND (0.5) (0.8)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	7.3 (1.0)	-	ND (5) (0.8)	ND (5) (0.8)	7.4 (1.0)	-
Volatile Organic Compounds (SW8011)																										
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	***0.057 (0.010)***	ND (0.028) (0.010)	ND (0.0097) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.0098)	ND (0.02) (0.02)	ND (0.029) (0.0095)	-	-	ND (0.010) (0.010)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.029) (0.0095)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0098)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																										
ANTHRACENE	µg/L	66	14.2 (1.0)	-	5.8 (0.10)	1.6 (0.010)	0.41 (0.010)	0.7 (0.1)	0.22 (0.010)	-	-	-	-	-	-	ND (0.10) (0.10)	-	0.042 J (0.010)	-	-	ND (0.10) (0.10)	-	-	-	ND (1.0) (1.0)	-
BENZO(A)ANTHRACENE	µg/L	4.9	***8.27 (1.0)***	-	3.0 (0.10)	0.48 (0.010)	0.086 (0.010)	2 (0.1)	0.89 (0.010)	-	0.2 (0.014)	-	ND	-	-	ND (0.10) (0.10)	-	0.021 J (0.010)	-	-	0.175 (0.10)	-	-	-	ND (1.0) (1.0)	-
BENZO(A)PYRENE	µg/L	0.2	***6.03 (1.0)***	-	***2.5 (0.10)***	***0.34 (0.010)***	0.071 (0.010)	***2 (0.1)***	***0.66 J (0.010)***	-	0.2 (0.029)	-	ND	-	-	ND (0.10) (0.10)	-	0.030 J (0.010)	-	-	0.177 (0.10)	-	-	-	*ND (1.0)* (1.0)	-
BENZO(B)FLUORANTHENE	µg/L	1.2	***6.09 (1.0)***	-	***3.1 (0.10)***	0.47 (0.010)	0.083 (0.010)	***2 (0.1)***	0.75 J (0.010)	-	0.3 (0.022)	-	ND	-	-	ND (0.10) (0.10)	-	0.043 J (0.010)	-	-	0.167 (0.10)	-	-	-	ND (1.0) (1.0)	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	***2.89 (1.0)***	-	***1.5 (0.10)***	0.16 (0.010)	0.057 (0.010)	***1 (0.1)***	***0.32 J (0.010)***	-	ND (0.2) (0.034)	-	-	-	-	ND (0.10) (0.10)	-	0.033 J (0.010)	-	-	0.120 (0.10)	-	-	-	*ND (1.0)* (1.0)	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	***6.78 (1.0)***	-	***2.6 (0.10)***	0.43 (0.010)	0.090 (0.010)	***3 (0.1)***	1.0 (0.010)	ND (1) (1)	0.2 (0.014)	*ND (5)* (1)	ND (1.0)	-	ND (1) (1)	ND (0.10) (0.10)	-	0.050 J (0.010)	ND (1) (1)	*ND (5)* (1)	0.190 (0.10)	-	*ND (10)* (1)	*ND (5)* (1)	ND (1.0) (1.0)	-
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	36.6 (1.0)	-	14 (0.10)	5.5 (0.010)	3.0 (0.010)	0.9 (0.1)	0.34 (0.010)	ND (1) (1)	ND (0.2) (0.024)	ND (5) (1)	ND (1.0)	-	-	ND (0.10) (0.10)	-	0.042 J (0.010)	ND (1) (1)	ND (5) (1)	0.319 (0.10)	-	ND (10) (1)	6 (1)	2.12 (1.0)	-
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	ND (0.2) (0.038)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (0.10) (0.10)	-	8.0 (0.30)	4.4 (0.030)	ND (0.064) (0.030)	ND (0.1) (0.1)	ND (0.063) (0.030)	ND (1) (1)	2 (1)	ND (5) (1)	ND (1.0)	-	ND (1) (1)	ND (0.10) (0.10)	-	ND (0.061) (0.031)	ND (1) (1)	ND (5) (1)	0.914 (0.10)	-	ND (10) (1)	ND (5) (1)	1.44 (1.0)	-
PHENANTHRENE	µg/L	1100	74.9 (1.0)	-	25 (0.30)	6.0 (0.030)	0.86 (0.030)	ND (0.1) (0.1)	0.24 (0.030)	ND (1) (1)	ND (0.2) (0.03)	ND (5) (1)	ND (1.0)	-	ND (1) (1)	ND (0.10) (0.10)	-	0.065 (0.031)	ND (1) (1)	ND (5) (1)	0.219 (0.10)	-	ND (10) (1)	ND (5) (1)	1.26 (1.0)	-
PYRENE	µg/L	130	24.1 (1.0)	-	6.4 (0.10)	1.1 (0.010)	0.35 (0.010)	7 (0.1)	2.9 (0.010)	ND (1) (1)	0.4 (0.021)	ND (5) (1)	ND (1.0)	-	ND (1) (1)	0.115 (0.10)	-	0.085 (0.010)	ND (1) (1)	ND (5) (1)	0.530 (0.10)	-	ND (10) (1)	ND (5) (1)	ND (1.0) (1.0)	-
Metals																										
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	-	-	-	-	ND (1) (0.18)	*ND (10)* (3)	ND (1) (0.047)	ND	-	-	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																										
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	194	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	***5.7 (3.0)***	***16.7 (0.13)***	2.1 (0.090)	4.7 (0.090)	ND (0.13) (0.13)	2.8 (0.09)	-	-	-	ND (0.047)	-	ND (0.050) (0.047)	-	ND (3.0) (3.0)	0.14 J (0.13)	-	-	-	4.2 (3.0)	-	-	-	ND (3.0) (3.0)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																										
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	616000	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	23300	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	1970	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	3540	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	7.49	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	900	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	13400	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	32000	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-48D																				B-92			
Sample Date			24-May-05	8-Jun-06	8-Apr-11	8-Apr-11	1-Jul-11	1-Jul-11	1-Jun-12	1-Jun-12	20-Aug-12	20-Aug-12	20-Aug-12	2-Nov-12	2-Nov-12	5-Feb-13	5-Feb-13	5-Feb-13	5-Feb-13	1-Apr-13	1-Apr-13	3-May-16	25-May-05	7-Jun-06	8-Jan-13	8-Jan-13
Sample ID			B48D-052405	B48D-060806	B-48D_04082011	B-48D_04082011 FILTERED	B-48D_07012011	B-48D_07012011 FILTERED	B-48D_6112	B-48D_6112	B-48D_082012	B-48D_082012	B-48D_082012	B-48D_110212	B-48D_110212	B-48D_020513	B-48D_020513	B-48D_020513	B-48D_020513	B-48D_40113	B-48D_40113	GW-11109613-B48D-05-03-16-AC-005	B92-052505	B92-060706	B92_010813	B92_010813
Sampling Company			--	--	--	--	--	--	--	--	--	--	--	--	--	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LANGAN	LANGAN	GHD	--	--	UNKNOWN	UNKNOWN
Laboratory			--	--	--	--	--	--	--	--	--	--	--	--	--	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	--	--	ACCUTEST	ACCUTEST
Laboratory Work Order			UNKNOWN	UNKNOWN	1241585	1241585	1254489	1254489	1312987	1312987	1330298	1330298	1330298	MC15557	MC15557	J828204	J828204	J828204R	J828204R	J832976	J832976	1657425	UNKNOWN	UNKNOWN	J825963	J825963
Laboratory Sample ID	Units	MSC-PA	4532026	4790622	6255424	6255425	6334734	6334735	6674608	6674609	6762330	6762331	6762332	MC15557-1	MC15557-1F	J828204-3	J828204-3F	J828204-3FR	J828204-3R	J832976-7	J832976-7F	8365508	4532840	4789405	J825963-4	J825963-4F
Field Parameters																										
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.62	-	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-83	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.44	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.27	-	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.1	-	-	-	-
Volatile Organic Compounds																										
BENZENE	µg/L	5	ND (5) (0.5)	ND (5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (0.50) (0.24)	-	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	*ND (2.0)* (0.50)	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (5) (1)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.63)	-	-	-	-	-	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (5) (0.8)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	1.0 (1.0)	-
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (5) (1)	ND (5) (1)	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.50)	-	-	-	-	-	ND (2.0) (0.45)	-	ND (2) (0.5)	9 (1)	7 (1)	11.0 (2.0)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (5) (0.5)	ND (5) (0.5)	4 (0.5)	-	4 (0.5)	-	6 (0.5)	-	7 (0.5)	-	-	6.2 (0.41)	-	-	-	-	-	6.2 (0.16)	-	12 (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (5) (0.7)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	-	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.35)	-	-	-	-	-	ND (2.0) (0.19)	-	ND (2) (0.5)	-	-	2.3 (2.0)	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	-	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.47)	-	-	-	-	-	ND (2.0) (0.36)	-	ND (2) (0.5)	-	-	ND (2.0) (2.0)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	ND (5) (0.8)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.58)	-	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	4.8 (1.0)	-
Volatile Organic Compounds (SW8011)																										
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0096)	ND (0.029) (0.0095)	ND (0.028) (0.010)	-	ND (0.0096) (0.010)	-	ND (0.0098) (0.010)	-	ND (0.0097) (0.010)	-	-	ND (0.014) (0.010)	-	-	-	-	-	ND (0.020) (0.011)	-	ND (0.029) (0.0096)	ND (0.029) (0.0097)	ND (0.028) (0.0094)	ND (0.020) (0.020)	-
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	ND (0.014) (0.012)	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																										
ANTHRACENE	µg/L	66	-	-	-	-	-	-	-	-	0.2 J (0.1)	-	-	0.36 B (0.018)	-	-	-	-	-	0.262 (0.020)	-	0.42 (0.010)	-	-	6.00 (1.0)	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.050) (0.030)	-	-	-	-	-	ND (0.10) (0.012)	-	0.044 J (0.010)	-	-	0.360 (0.10)	-
BENZO(A)PYRENE	µg/L	0.2	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.017)	-	-	-	-	-	ND (0.10) (0.012)	-	ND (0.050) (0.010)	-	-	0.133 (0.10)	-
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.050) (0.024)	-	-	-	-	-	ND (0.10) (0.010)	-	ND (0.050) (0.010)	-	-	ND (0.10) (0.10)	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.038)	-	-	-	-	-	ND (0.10) (0.016)	-	ND (0.050) (0.010)	-	-	ND (0.10) (0.10)	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	*ND (10)* (1)	*ND (5)* (1)	*ND (5)* (1)	-	ND (0.9) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.073)	-	-	-	-	-	ND (0.10) (0.012)	-	0.034 J (0.010)	*ND (10)* (1)	*ND (5)* (1)	0.315 (0.10)	-
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (0.9) (1)	-	0.9 (0.1)	-	0.3 J (0.1)	-	-	1.6 (0.046)	-	-	-	-	-	1.07 (0.017)	-	2.3 (0.010)	22 (1)	24 (1)	28.0 (1.0)	-
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (0.9) (1)	-	ND (0.09) (0.1)	-	0.2 J (0.1)	-	-	0.090 J (0.036)	-	-	-	-	-	ND (0.10) (0.036)	-	ND (0.060) (0.030)	ND (10) (1)	ND (5) (1)	1.18 (0.10)	-
PHENANTHRENE	µg/L	1100	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (0.9) (1)	-	0.3 J (0.1)	-	0.6 (0.1)	-	-	2.1 (0.013)	-	-	-	-	-	0.920 (0.021)	-	2.4 (0.030)	15 (1)	15 (1)	30.4 (1.0)	-
PYRENE	µg/L	130	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	1 J (1)	-	0.3 J (0.1)	-	0.3 J (0.1)	-	-	0.30 B (0.036)	-	-	-	-	-	0.270 (0.015)	-	0.43 (0.010)	ND (10) (1)	ND (5) (1)	2.91 (0.10)	-
Metals																										
ARSENIC	µg/L	10	-	-	ND (2.0) (0.95)	-	2.2 (0.95)	-	1.3 J (0.95)	-	1.3 J (0.40)	-	-	ND (4.0) (1.9)	-	ND (3.0) (3.0)	-	-	-	2.3 J (0.97)	-	-	-	-	-	-
COBALT	µg/L	35	-	-	ND (5.0) (2.3)	-	ND (0.62) (0.62)	-	ND (0.62) (0.62)	-	ND (0.66) (0.66)	-	-	*ND (50)* (0.40)	-	*ND (50)* (50)	-	-	-	*ND (50)* (0.59)	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	35100 (52.2)	-	39200 (14.1)	-	29300 (14.1)	-	26000 (33.3)	-	-	39700 (11)	-	33700 (100)	-	-	-	40100 (24)	-	-	-	-	-	-
LEAD	µg/L	5	ND (1) (0.18)	ND (1) (0.047)	ND (1.0) (0.052)	-	0.96 J (0.080)	-	ND (0.080) (0.080)	-	ND (0.034) (0.034)	-	-	ND (5.0) (2.1)	-	ND (3.0) (3.0)	-	-	-	***6.4 (1.7)***	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-
MANGANESE	µg/L	300	-	-	***2110 (0.84)***	-	***2030 (0.44)***	-	***1990 (0.44)***	-	***1880 (0.83)***	-	-	***2590 (0.54)***	-	***950 (15)***	-	-	-	***2210 (0.40)***	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	ND (0.070) (0.0081)	-	-	ND (0.20) (0.062)	-	-	-	-	ND (0.20) (0.20)	ND (0.20) (0.089)	-	-	-	-	-	-
Metals, Dissolved																										
ARSENIC	µg/L	10	-	-	-	ND (2.0) (0.95)	-	ND (2.0) (0.95)	-	ND (2.0) (0.95)	-	-	ND (2.0) (0.40)	-	ND (4.0) (1.9)	-	ND (3.0) (3.0)	-	-	-	1.8 J (0.97)	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	ND (5.0) (2.3)	-	ND (5.0) (0.62)	-	ND (5.0) (0.62)	-	-	ND (5.0) (0.66)	-	*ND (50)* (0.40)	-	*ND (50)* (50)	-	-	-	*ND (50)* (0.59)	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	9310 (52.2)	-	12500 (14.1)	-	21000 (14.1)	-	-	6430 (33.3)	-	28900 (11)	-	25200 (100)	-	-	-	24800 (24)	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	ND (1.0) (0.052)	-	ND (1.0) (0.080)	-	ND (1.0) (0.080)	-	-	ND (1.0) (0.034)	-	ND (5.0) (2.1)	-	ND (3.0) (3.0)	-	-	-	***6.2 (1.7)***	ND (1.0) (0.13)	-	-	-	4.1 (3.0)
MANGANESE	µg/L	300	-	-	-	***2050 (0.84)***	-	***1890 (0.44)***	-	***1960 (0.44)***	-	-	***1830 (0.83)***	-	***2490 (0.54)***	-	***2070 (15)***	-	-	-	***2110 (0.40)***	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.0081)	-	ND (0.20) (0.062)	-	-	ND (0.20) (0.20)	-	-	ND (0.20) (0.089)	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																										
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	272000 (460)	-	274000 (460)	-	-	-	280000 (700)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	ND (2000) (460)	-	ND (460) (460)	-	ND (700) (700)	-	ND (700) (700)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	272000 (460)	-	274000 (460)	-	274000 (700)	-	280000 (700)	-	-	340000 (5000)	-	-	-	-	-	350000 (5000)	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	274000 (700)	-	-	-	-	340000 (5000)	-	-	-	-	-	350000 (3500)	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	72300 (200)	-	74100 (200)	-	71200 (200)	-	82300 (200)	-	-	67700 (1000)	-	-	-	-	-	64500 (48)	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	160 (100)	-	-	-	-	-	150 B (5.1)	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	6700 (200)	-	8400 (200)	-	7000 (200)	-	8800 (200)	-	-	290 (100)	-	-	-	-	-	9500 (330)	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	ND (500) (50)	-	ND (250) (50)	-	300 J (50)	-	ND (250) (50)	-	-	210 (110)	-	-	-	-	-	20 B (5.6)	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	210 (100)	-	-	-	-	-	20 B (4.6)	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	ND (10) (10.0)	-	-	-	-	-	ND (10) (1)	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	ND (5000) (300)	-	3700 J (300)	-	3100 J (300)	-	ND (1500) (300)	-	-	ND (5000) (5000)	-	-	-	-	-	380 B (380)	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	ND (160) (54)	-	ND (54) (54)	-	ND (54) (54)	-	-	ND (54) (54)	-	ND (2000) (2000)	-	-	-	-	-	680 B (280)	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	6500 (1000)	-	-	-	-	-	4800 (240)	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	429000 (9700)	-	313000 (9700)	-	395000 (9700)	-	397000 (9700)	-	-	388000 (10000)	-	-	-	-	-	300000 (1800)	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	5500 (500)	-	7100 (500)	-	6100 (500)	-	5800 (500)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-94				B-95		B-115					B-116								B-117			
Sample Date			25-May-05	9-Jun-06	7-Jan-13	7-Jan-13	8-Jun-11	23-May-16	24-May-05	7-Jun-06	4-Jan-13	4-Jan-13	4-May-16	24-May-05	10-Aug-06	4-Jan-13	4-Jan-13	4-May-16	24-Aug-16	25-Aug-16	25-Aug-16	24-May-05	7-Jun-06	4-May-16	22-Aug-16
Sample ID			B94-052505	B94-060906	894_010713	894_010713	B-95 GP U 677-MW	B-95-20160523	B115-052405	B115-060706	B115_010413	B115_010413	GW-11109613-B115-05-04-16-AC-007	B116-052405	B116-081006	B116_010413	B116_010413	GW-11109613-B116-05-04-16-RM-006	GW-11109613-B-116-082416-AC-026	GW-11109613-B-116-082416-AC-027	GW-11109613-B-116D-082416-AC-028	B117-052405	B117-060706	GW-11109613-B117-05-04-16-AC-008	GW-11109613-B-117-082216-AC-006
Sampling Company			--	--	UNKNOWN	UNKNOWN	--	STANTEC	--	--	UNKNOWN	UNKNOWN	GHD	--	--	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	--	--	GHD	GHD
Laboratory			--	--	ACCUTEST	ACCUTEST	--	LL	--	--	ACCUTEST	ACCUTEST	LL	--	--	ACCUTEST	ACCUTEST	LL	LL	LL	LL	--	--	LL	LL
Laboratory Work Order			UNKNOWN	UNKNOWN	J825834	J825834	1250778	1666456	UNKNOWN	UNKNOWN	J825729	J825729	1657425	UNKNOWN	UNKNOWN	J825729	J825729	1657425	1700681	1700681	1700681	UNKNOWN	UNKNOWN	1657425	1699628
Laboratory Sample ID	Units	MSC-PA	4532838	4790632	J825834-1	J825834-1F	6311692	8402591	4532024	4789403	J825729-1	J825729-1F	8365510	4532025	4840112	J825729-2	J825729-2F	8365509	8553518	8553520	8553521	4532023	4789401	8365511	8548682
Field Parameters																									
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	0.866	-	-	-	-	1.44	-	1.42	1.42	-	-	1.67	1.4
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	2.5	-	-	-	-	4.88	-	-	-	-	0	-	7.38	7.38	-	-	0	1.83
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-83	-	-	-	-	-22	-	-	-	-	-66	-	111	111	-	-	-49	-128
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	7.49	-	-	-	-	6.67	-	-	-	-	6.29	-	6.55	6.55	-	-	6.11	6.57
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	0.518	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	17.52	-	-	-	-	13	-	-	-	-	13.3	-	23	23	-	-	13.4	22.94
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	0.331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	74.2	-	-	-	-	10	-	-	-	-	470	-	282	282	-	-	42	365
Volatile Organic Compounds																									
BENZENE	µg/L	5	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (1) (0.5)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (5) (0.8)	1.2 (1.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (5) (0.8)	ND (5) (0.8)	2.0 (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	ND (1) (0.5)	ND (1) (0.5)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (5) (1)	ND (5) (1)	ND (2.0) (2.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (5) (1)	ND (5) (1)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (5) (1)	ND (5) (1)	ND (2.0) (2.0)	-	0.5 J (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (5) (1)	ND (5) (1)	ND (2) (0.5)	ND (2) (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	***34 (0.5)***	20 (0.5)	12.3 (1.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (1) (0.5)	ND (1) (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	0.5	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	-	2.5 (2.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	-	-	3.7 (2.0)	-	ND (2) (0.5)	-	-	3.4 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	-	ND (2) (0.5)	ND (2) (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	-	ND (2.0) (2.0)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	-	-	ND (2.0) (2.0)	-	ND (2) (0.5)	-	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	-	ND (2) (0.5)	ND (2) (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	ND (5) (0.8)	4.7 (1.0)	-	0.5 J (0.5)	ND (0.5) (0.5)	ND (5) (0.8)	ND (5) (0.8)	7.4 (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	6.3 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	16 (0.8)	ND (1) (0.5)	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																									
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.028) (0.0095)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.0099) (0.010)	ND (0.0097) (0.010)	ND (0.029) (0.0097)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-	ND (0.028) (0.0095)	ND (0.029) (0.0097)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.029) (0.0096)	ND (0.029) (0.0096)	ND (0.028) (0.0095)	ND (0.028) (0.010)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																									
ANTHRACENE	µg/L	66	-	-	0.154 (0.10)	-	-	ND (0.1) (0.1)	-	-	ND (1.0) (1.0)	-	0.065 (0.010)	-	-	0.363 (0.10)	-	0.27 (0.010)	0.036 J (0.010)	0.11 (0.010)	0.080 (0.010)	-	-	1.8 (0.010)	1.0 (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	ND (0.10) (0.10)	-	-	0.2 J (0.1)	-	-	ND (1.0) (1.0)	-	0.034 J (0.010)	-	-	ND (0.10) (0.10)	-	0.058 (0.010)	0.021 J (0.010)	0.045 J (0.010)	0.028 J (0.010)	-	-	0.46 (0.010)	0.25 (0.010)
BENZO(A)PYRENE	µg/L	0.2	-	-	ND (0.10) (0.10)	-	-	***0.3 J (0.1)***	-	-	ND (1.0) (1.0)	-	ND (0.052) (0.010)	-	-	ND (0.10) (0.10)	-	0.013 J (0.010)	ND (0.050) (0.010)	0.018 J (0.010)	ND (0.051) (0.010)	-	-	***0.34 (0.010)***	0.19 J (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	ND (0.10) (0.10)	-	-	0.2 J (0.1)	-	-	ND (1.0) (1.0)	-	0.012 J (0.010)	-	-	ND (0.10) (0.10)	-	0.017 J (0.010)	ND (0.050) (0.010)	0.023 J (0.010)	ND (0.051) (0.010)	-	-	0.42 (0.010)	0.23 J (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	ND (0.10) (0.10)	-	-	0.2 J (0.1)	-	-	*ND (1.0)* (1.0)	-	ND (0.052) (0.010)	-	-	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (0.051) (0.010)	ND (0.051) (0.010)	-	-	0.22 (0.010)	0.13 J (0.010)
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	*ND (10)* (1)	*ND (5)* (1)	ND (0.10) (0.10)	-	0.18 J (0.080)	0.4 J (0.1)	*ND (10)* (1)	*ND (5)* (1)	ND (1.0) (1.0)	-	0.035 J (0.010)	*ND (10)* (1)	*ND (5)* (1)	ND (0.10) (0.10)	-	0.066 (0.010)	0.031 J (0.010)	0.059 (0.010)	0.039 J (0.010)	*ND (10)* (1)	*ND (5)* (1)	0.54 (0.010)	0.34 (0.010)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	ND (10) (1)	ND (5) (1)	1.16 (0.10)	-	-	ND (0.1) (0.1)	ND (10) (1)	ND (5) (1)	ND (1.0) (1.0)	-	0.13 (0.010)	ND (10) (1)	ND (5) (1)	1.50 (0.10)	-	1.5 (0.010)	0.054 (0.010)	1.1 (0.010)	0.91 (0.010)	ND (10) (1)	ND (5) (1)	0.74 (0.010)	0.24 (0.010)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (10) (1)	ND (5) (1)	0.601 (0.10)	-	ND (1) (1)	ND (0.1) (0.1)	ND (10) (1)	ND (5) (1)	1.24 (1.0)	-	ND (0.063) (0.031)	ND (10) (1)	ND (5) (1)	0.793 (0.10)	-	0.070 (0.030)	0.031 J (0.030)	ND (0.061) (0.030)	ND (0.062) (0.030)	ND (10) (1)	ND (5) (1)	0.11 (0.031)	ND (0.061) (0.030)
PHENANTHRENE	µg/L	1100	ND (10) (1)	ND (5) (1)	1.18 (0.10)	-	0.18 J (0.080)	ND (0.1) (0.1)	ND (10) (1)	ND (5) (1)	ND (1.0) (1.0)	-	0.40 (0.031)	ND (10) (1)	ND (5) (1)	0.946 (0.10)	-	0.054 J (0.030)	ND (0.060) (0.030)	ND (0.061) (0.030)	ND (0.062) (0.030)	ND (10) (1)	ND (5) (1)	0.94 (0.031)	1.1 (0.030)
PYRENE	µg/L	130	ND (10) (1)	ND (5) (1)	0.384 (0.10)	-	1.2 (0.10)	0.7 (0.1)	ND (10) (1)	ND (5) (1)	ND (1.0) (1.0)	-	0.24 (0.010)	ND (10) (1)	ND (5) (1)	0.383 (0.10)	-	0.65 (0.010)	0.29 (0.010)	0.39 (0.010)	0.32 (0.010)	ND (10) (1)	ND (5) (1)	3.3 (0.010)	2.4 (0.010)
Metals																									
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	ND (1) (0.18)	ND (1) (0.047)	-	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																									
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	ND (3.0) (3.0)	ND (0.052) (0.052)	ND (0.13) (0.13)	-	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	-	-	ND (3.0) (3.0)	0.88 J (0.13)	ND (1.0) (0.090)	0.14 J (0.090)	0.16 J (0.090)	-	-	ND (1.0) (0.13)	0.25 J (0.09)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																									
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-123				B-125						B-126						B-131											
Sample Date			25-May-05	7-Jun-06	8-Jan-13	8-Jan-13	24-May-05	6-Jun-06	8-Jan-13	8-Jan-13	9-May-16	23-Aug-16	24-May-05	6-Jun-06	7-Jan-13	7-Jan-13	10-May-16	23-Aug-16	1-Jan-95	1-Jan-96	1-Jan-97	1-Jan-98	1-Jan-99	1-Jan-00	1-Jan-01	1-Jan-02	13-Nov-03	21-Oct-04	24-May-05	9-Nov-05
Sample ID			B123-052505	B123-060706	B123_010813	B123_010813	B125-052405	B125-060606	B125_010813	B125_010813	GW-11109613-B125-05-09-16-MM-032	GW-11109613-B-125-082316-KC-010	B126-052405	B126-060606	B-126_010713	B-126_010713	GW-11109613-B126-05-10-16-MM-035	GW-11109613-B-126-082316-KC-008	B-131	B-131	B-131	B-131	B-131	B-131	B-131	B-131	B-131	B-131	B131-052405	B-131_11_9_2005
Sampling Company			--	--	UNKNOWN	UNKNOWN	--	--	UNKNOWN	UNKNOWN	GHD	GHD	--	--	UNKNOWN	UNKNOWN	GHD	GHD	--	--	--	--	--	--	--	--	--	--	--	--
Laboratory			--	--	ACCUTEST	ACCUTEST	--	--	ACCUTEST	ACCUTEST	LL	LL	--	--	ACCUTEST	ACCUTEST	LL	LL	--	--	--	--	--	--	--	--	--	--	--	--
Laboratory Work Order			UNKNOWN	UNKNOWN	JB25963	JB25963	UNKNOWN	UNKNOWN	JB25964	JB25964	1659064	1699628	UNKNOWN	UNKNOWN	JB25835	JB25835	1659064	1699628	20140718EZ	20140718EZ	20140718EZ	20140718EZ	20140718EZ	20140718EZ	20140718EZ	20140718EZ	20140718EZ	20140718EZ	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	4532839	4789404	JB25963-1	JB25963-1F	4532020	4788113	JB25964-1	JB25964-1F	8373137	8548687	4532019	4788114	JB25835-1	JB25835-1F	8373140	8548685	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	4532022	46746-25
Field Parameters																														
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	-	5.06	5.81	-	-	-	-	1.19	1.27	-	-	-	-	-	-	-	-	-	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	-	-	-	0.68	2.72	-	-	-	-	18.5	12.69	-	-	-	-	-	-	-	-	-	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-	-	-	-152	-146	-	-	-	-	-118	-168	-	-	-	-	-	-	-	-	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	6.8	6.92	-	-	-	-	7.07	7.07	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	-	-	-	15.6	23.2	-	-	-	-	13.3	23.4	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54	-	1.1	0.58	0.53	0.47	0.76	0.66	0.648	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	-	-	-	0	0.1	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																														
BENZENE	µg/L	5	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	***66 (0.5)***	***73 (0.5)***	***173 (1.0)***	-	***9 (0.5)***	***9 (0.5)***	***200 (0.5)***	***220 (0.5)***	***189 (5.0)***	-	***95 (5)***	***78 (0.5)***	ND	ND (0.3)	***12***	ND (1)	***19***	ND (1)	ND (1)	5	4.2	ND (1.0)	***20 (0.5)***	ND (1) (1)
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.020)	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	*ND (10)* (5)	ND (5) (0.5)	-	-	-	-	-	-	-	-	-	ND (5.0)	ND (5) (1)	ND (1) (1)
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (5) (0.8)	1.4 (1.0)	-	10 (0.8)	12 (0.8)	1.3 (1.0)	-	0.6 J (0.5)	ND (1) (0.5)	19 (0.8)	24 (0.8)	17.7 (1.0)	-	13 (5)	9 (0.5)	ND	ND (0.4)	2	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1.0)	ND (5.0)	ND (5) (0.8)	ND (1) (1)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) (1)
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	36 (1)	38 (1)	29.7 (2.0)	-	7 (1)	10 (1)	14.0 (2.0)	-	8 (0.5)	9 (0.5)	26 (1)	42 (1)	63.5 (2.0)	-	60 (5)	40 (0.5)	-	-	-	-	-	-	-	-	-	10	13 (1)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (10) (5)	ND (5) (0.5)	-	-	-	-	-	1.1	2	ND (1)	ND (1.0)	ND (5.0)	ND (5) (0.5)	ND (1) (1)
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-	75 (0.7)	79 (0.7)	6.1 (1.0)	-	3 (0.5)	4 (0.5)	50 (0.7)	61 (0.7)	43.1 (1.0)	-	40 (5)	29 (0.5)	ND	ND (0.3)	1	ND (1)	ND (1)	ND (1)	ND (1)	1	ND (1.0)	ND (5.0)	ND (5) (0.7)	ND (1) (1)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	26	1	20	ND	ND	8	5.13	ND	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	-	2.4 (2.0)	-	-	-	ND (2.0) (2.0)	-	2 J (0.5)	0.8 J (0.5)	-	-	12.3 (2.0)	-	8 J (5)	5 J (0.5)	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	-	ND (2.0) (2.0)	-	-	-	ND (2.0) (2.0)	-	3 (0.5)	2 (0.5)	-	-	6.6 (2.0)	-	7 J (5)	4 J (0.5)	-	-	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	ND (5) (0.8)	6.0 (1.0)	-	78 (0.8)	110 (0.8)	9.0 (1.0)	-	30 (0.5)	25 (0.5)	87 (0.8)	110 (0.8)	76.2 (1.0)	-	64 (5)	47 (0.5)	ND	ND (0.6)	11	1	1	ND (1)	ND (1)	2	0.93 J	ND (10)	ND (5) (0.8)	ND (1) (1)
Volatile Organic Compounds (SW8011)																														
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0097)	ND (0.029) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.028) (0.0094)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.028) (0.010)	ND (0.029) (0.0096)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.028) (0.010)	-	-	-	-	-	-	-	-	-	-	ND (0.029) (0.0096)	ND (0.02) (0.02)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																														
ANTHRACENE	µg/L	66	-	-	4.51 (0.11)	-	-	-	2.15 (0.10)	-	1.5 (0.010)	1.9 (0.010)	-	-	10.5 (1.0)	-	9.1 (0.010)	6.6 (0.010)	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	ND (0.11) (0.11)	-	-	-	0.559 (0.10)	-	0.45 (0.010)	0.16 (0.010)	-	-	0.363 (0.10)	-	0.71 (0.010)	0.82 (0.010)	ND (1)	-	ND (1)	ND (1)	1	ND (1)	ND (1)	ND (1)	0.60 J	-	-	0.3 (0.014)
BENZO(A)PYRENE	µg/L	0.2	-	-	ND (0.11) (0.11)	-	-	-	***0.262 (0.10)***	-	***0.23 (0.010)***	0.040 J (0.010)	-	-	0.119 (0.10)	-	***0.38 (0.010)***	***0.39 J (0.010)***	*ND (1)*	-	*ND (1)*	*ND (1)*	*ND (1)*	*ND (2)*	*ND (2)*	*ND (1)*	*ND (2.0)*	-	-	ND (0.1) (0.029)
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	ND (0.11) (0.11)	-	-	-	0.224 (0.10)	-	0.25 (0.010)	0.046 J (0.010)	-	-	ND (0.10) (0.10)	-	0.36 (0.010)	0.39 J (0.010)	ND (1)	-	ND (1)	ND (1)	ND (1)	*ND (3)*	*ND (3)*	ND (1)	*ND (2.0)*	-	-	0.1 (0.022)
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	ND (0.11) (0.11)	-	-	-	ND (0.10) (0.10)	-	0.070 (0.010)	0.012 J (0.010)	-	-	ND (0.10) (0.10)	-	0.11 (0.010)	0.14 J (0.010)	-	-	-	-	-	-	-	-	-	-	-	ND (0.1) (0.034)
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***11***	-	ND (1)	ND (1)	3	ND (3)	ND (3)	ND (1)	ND (2.0)	-	-	-
CHRYSENE	µg/L	1.9	*ND (10)* (1)	*ND (5)* (1)	ND (0.11) (0.11)	-	*ND (10)* (1)	*ND (5)* (1)	0.414 (0.10)	-	0.34 (0.010)	0.13 (0.010)	*ND (10)* (1)	*ND (5)* (1)	0.296 (0.10)	-	0.60 (0.010)	0.67 (0.010)	ND	ND (1)	ND (1)	ND (1)	1	ND (1)	ND (1)	*ND (2)*	*ND (2.0)*	0.35 J	*ND (10)* (1)	0.4 (0.014)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*ND (1)*	-	*ND (1)*	*ND (1)*	*ND (1)*	*ND (4)*	*ND (4)*	*ND (2)*	*ND (2.0)*	-	-	-
FLUORENE	µg/L	1900	31 (1)	45 (1)	14.4 (1.1)	-	15 (1)	17 (1)	5.77 (1.0)	-	4.8 (0.010)	6.6 (0.010)	12 (1)	36 (1)	49.5 (1.0)	-	43 (0.10)	39 (0.010)	-	-	-	-	-	-	-	-	-	ND (9.8)	ND (10) (1)	0.5 (0.024)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***10 J***	*ND (5)*	*ND (10)*	*ND (10)*	*ND (10)*	*ND (10)*	*ND (10)*	-	-	ND (0.1) (0.038)
NAPHTHALENE	µg/L	100	ND (10) (1)	ND (5) (1)	2.12 (0.11)	-	ND (10) (1)	7 (1)	1.16 (0.10)	-	0.40 (0.030)	0.31 (0.030)	ND (10) (1)	23 (1)	25.3 (1.0)	-	22 (0.31)	5.4 (0.030)	-	-	-	-	-	-	-	-	-	ND (5.0)	ND (10) (1)	ND (1) (1)
PHENANTHRENE	µg/L	1100	ND (10) (1)	17 (1)	5.34 (1.1)	-	ND (10) (1)	7 (1)	1.48 (0.10)	-	1.2 (0.030)	3.3 (0.030)	ND (10) (1)	16 (1)	54.4 (1.0)	-	53 (0.31)	5.1 (0.030)	-	-	-	-	-	-	-	-	-	ND (9.8)	ND (10) (1)	0.4 (0.03)
PYRENE	µg/L	130	ND (10) (1)	7 (1)	2.44 (0.11)	-	ND (10) (1)	7 (1)	2.55 (0.10)	-	2.1 (0.010)	1.4 (0.010)	ND (10) (1)	6 (1)	3.88 (0.10)	-	4.7 (0.010)	5.7 (0.010)	-	-	-	-	-	-	-	-	-	ND (9.8)	ND (10) (1)	3.3 (0.021)
Metals																														
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	ND (1) (0.18)	ND (1) (0.047)	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	-	ND (5.0)	-	ND (5.0)	***18***	***32***	*ND (10)*	***133***	*ND (10)*	***15.3***	-	ND (1) (0.18)	*ND (10)* (3)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																														
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5.0)	-	ND (5.0)	ND (8.0)	ND (8.0)	ND (8)	ND (8)	ND (8)	ND (5.0)	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	210	150	160	113	371	173	210	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (25)	-	ND (50)	ND (10)	ND (10)	ND (10)	37	ND (10)	ND (10)	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (25)	-	*ND (50)*	ND (10)	ND (10)	ND (10)	12	ND (10)	*ND (50)*	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	ND (3.0) (3.0)	-	-	-	4.4 (3.0)	0.24 J (0.13)	ND (1.0) (0.09)	-	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	ND (1.0) (0.09)	-	-	-	-	-	-	-	-	-	ND (5.0)	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5.0)	-	ND (5.0)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (5.0)	-	-	-
General Chemistry																														
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510000	-	860000	540000	510000	410000	640000	620000	556000	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13000	-	67000	18000	23000	210000	26700	28300	ND (20000)	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3200	-	990	1800	2100	3170	1160	640	580	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	-	6600	4300	3000	4670	12100	5190	6800	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	ND (50)	50	130	230	ND (100)	ND (100)	ND (100)	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.13	-	7.65	7	8.26	7	6.8	7.19	7.24	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	880	-	1500	940	840	690	1400	1272	1090	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000	-	11000	ND (2000)	ND (2000)	5100	609	9660	26500	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23000	-	28000	22000	28000	14400	22600	18900	14100	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-131																B-132			B-132D								
Sample Date			6-Jun-06	4-Dec-06	18-Dec-07	4-Nov-08	4-Nov-08	9-Nov-10	16-Nov-11	8-Jan-13	8-Jan-13	8-Apr-13	8-Apr-13	8-Apr-13	2-Jun-14	2-Jun-14	20-May-15	5-May-16	6-Jun-06	11-May-16	24-Aug-16	11-Apr-11	11-Apr-11	1-Jul-11	1-Jul-11	31-May-12	31-May-12	20-Aug-12	20-Aug-12	20-Aug-12
Sample ID			B131-060606	B-131	B-131	B-131	B-131_110408	B-131	B-131	B131_010813	B131_010813	B-131	B-131_040813	B-131_040813	B-131	B-131	B-131_20150520	GW-11109613-B131-05-05-16-RM-012	B132D-060606	GW-11109613-B132-05-11-16-AC-042	GW-11109613-B-132-082416-AC-018	B-132D_04112011	B-132D_04112011 FILTERED	B-132D_07012011	B-132D_07012011 FILTERED	B-132D_53112	B-132D_53112	B-132D_082012	B-132D_082012	B-132D_082012
Sampling Company			--	--	--	--	--	--	--	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	GHD	--	GHD	GHD	--	--	--	--	--	--	--	--	--
Laboratory			--	--	--	--	--	--	--	ACCUTEST	ACCUTEST	UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	--	LL	LL	--	--	--	--	--	--	--	--	--
Laboratory Work Order			UNKNOWN	20140718EZ	20140718EZ	20140718EZ	1118614	20140718EZ	20140718EZ	J825964	J825964	20140718EZ	J833644	J833644	J868336	J868336	1562821	1658374	UNKNOWN	1660120	1700681	1241791	1241791	1254490	1254490	1312987	1312987	1330298	1330298	1330298
Laboratory Sample ID	Units	MSC-PA	4788110	UNKNOWN	UNKNOWN	UNKNOWN	5519547	UNKNOWN	UNKNOWN	J825964-2	J825964-2F	UNKNOWN	J833644-16	J833644-16F	J868336-14	J868336-14F	7896253	8370267	4788107	8378038	8553510	6256333	6256334	6334740	6334741	6674591	6674592	6762321	6762322	6762323
Field Parameters																														
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.01	-	NM	-	-	-	-	-	-	-	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.55	0	-	NM	-	-	-	-	-	-	-	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-103	-95	-	NM	-	-	-	-	-	-	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.87	6.84	-	NM	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.956	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.17	11.9	-	NM	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.611	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.8	0	-	NM	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																														
BENZENE	µg/L	5	ND (5) (0.5)	4.0 J	ND (0.5)	-	ND (0.5) (0.5)	ND (0.5)	ND (0.5)	***19.7 (1.0)***	-	-	1.1 (0.24)	-	0.29 J (0.21)	-	2 (0.5)	1 (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	ND (0.0098)	ND (0.0096)	-	-	ND (0.0098)	ND (0.0097)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (1.0)	ND (0.5)	-	ND (0.5) (1)	ND (0.5)	ND (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (0.8)	ND (0.5)	-	ND (0.5) (0.8)	ND (0.5)	ND (0.5)	ND (1.0) (1.0)	-	-	0.32 J (0.23)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	17 (1)	11	9.0	-	6 (1)	10	5	10.6 (2.0)	-	-	13 (0.45)	-	12.1 (0.26)	-	11 (0.5)	8 (0.5)	ND (5) (1)	8 (0.5)	5 (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (5) (0.5)	ND (0.5)	-	-	ND (0.5) (0.5)	ND (0.5)	ND (0.5)	ND (1.0) (1.0)	-	-	ND (1) (0.16)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	1 (0.5)	-	1 (0.5)	-	2 (0.5)	-	2 (0.5)	-	-
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (0.7)	ND (0.5)	-	ND (0.5) (0.7)	ND (0.5)	ND (0.5)	ND (1.0) (1.0)	-	-	0.61 J (0.23)	-	0.30 J (0.22)	-	0.9 J (0.5)	ND (1) (0.5)	ND (5) (0.7)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
TOTAL BTEX	µg/L	n/v	-	4	ND	ND	-	0.5	ND	-	-	2.65	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	-	-	-	ND (0.5) (1)	ND (0.5)	ND (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-	ND (0.5) (0.5)	ND (2) (0.5)	-	ND (2) (0.5)	ND (2) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	-	-	-	ND (0.5) (1)	ND (0.5)	ND (0.5)	ND (2.0) (2.0)	-	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (2) (0.5)	-	ND (2) (0.5)	ND (2) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	ND (0.8)	ND (0.5)	-	ND (0.5) (0.8)	0.5 J	ND (0.5)	1.1 (1.0)	-	-	0.62 J (0.24)	-	0.56 J (0.20)	-	0.6 J (0.5)	0.6 J (0.5)	ND (5) (0.8)	ND (1) (0.5)	ND (1) (0.5)	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-
Volatile Organic Compounds (SW8011)																														
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0096)	-	-	-	ND (0.0098) (0.010)	-	-	ND (0.020) (0.020)	-	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-	ND (0.0096) (0.010)	ND (0.029) (0.0097)	ND (0.029) (0.0095)	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.0097) (0.010)	-	ND (0.0096) (0.010)	-	ND (0.0098) (0.010)	-	ND (0.0097) (0.010)	-	-
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																														
ANTHRACENE	µg/L	66	-	-	-	-	-	-	-	0.916 (0.10)	-	-	0.477 (0.02)	-	0.747 (0.020)	-	0.7 (0.1)	0.76 (0.010)	-	13 (0.10)	1.5 (0.010)	-	-	-	-	-	-	0.2 J (0.1)	-	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	-	-	-	-	-	0.356 (0.10)	-	-	0.169 (0.012)	-	0.258 (0.012)	-	0.4 J (0.1)	0.37 (0.010)	-	***7.7 (0.10)***	0.88 (0.010)	-	-	-	-	-	-	ND (1.0) (0.1)	-	-
BENZO(A)PYRENE	µg/L	0.2	-	-	-	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	0.2 J (0.1)	0.090 (0.010)	-	***4.4 (0.10)***	***0.49 (0.010)***	-	-	-	-	-	-	ND (1.0) (0.1)	-	-
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	-	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.01)	-	ND (0.10) (0.010)	-	0.2 J (0.1)	0.12 (0.010)	-	***5.6 (0.10)***	0.57 (0.010)	-	-	-	-	-	-	ND (1.0) (0.1)	-	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	-	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.016)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	0.021 J (0.010)	-	***1.5 (0.10)***	0.17 (0.010)	-	-	-	-	-	-	ND (1.0) (0.1)	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	*ND (5)* (1)	***2.0 J***	ND (1.0)	-	ND (1) (1)	ND (1)	***5.4***	0.331 (0.10)	-	-	0.132 (0.012)	-	0.206 (0.012)	-	0.4 J (0.1)	0.29 (0.010)	*ND (5)* (1)	***5.1 (0.10)***	0.61 (0.010)	ND (1) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (1.0) (0.1)	-	-
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	ND (5) (1)	2.0 J	2.0 J	-	-	3 J	4.0	1.41 (0.10)	-	-	1.08 (0.017)	-	1.74 (0.017)	-	2 (0.1)	1.9 (0.010)	ND (5) (1)	51 (0.10)	27 (0.010)	ND (1) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (1.0) (0.1)	-	-
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	ND (2.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (5) (1)	ND (1.0)	ND (1.0)	-	ND (1) (1)	ND (1)	ND (0.96)	ND (0.10) (0.10)	-	-	ND (0.1) (0.036)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	ND (0.061) (0.030)	ND (5) (1)	1.4 (0.31)	ND (0.060) (0.030)	ND (1) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	0.1 J (0.1)	-	-
PHENANTHRENE	µg/L	1100	ND (5) (1)	1.0 J	ND (1.0)	-	ND (1) (1)	ND (1)	0.65	0.496 (0.10)	-	-	0.43 (0.021)	-	0.333 (0.021)	-	0.4 J (0.1)	0.66 (0.030)	ND (5) (1)	74 (0.31)	20 (0.030)	ND (1) (1)	-	ND (1) (1)	-	0.3 J (0.1)	-	0.3 J (0.1)	-	-
PYRENE	µg/L	130	6 (1)	8.0	4.0 J	-	5 (1)	5	19	3.00 (0.10)	-	-	1.13 (0.015)	-	2.51 (0.015)	-	3 (0.1)	2.3 (0.010)	ND (5) (1)	19 (0.10)	3.4 (0.010)	ND (1) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	0.1 J (0.1)	-	-
Metals																														
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6 (0.95)	-	4.3 (0.95)	-	3.7 (0.95)	-	4.0 (0.40)	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2.3) (2.3)	-	ND (0.62) (0.62)	-	ND (0.62) (0.62)	-	ND (0.66) (0.66)	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37200 (52.2)	-	37100 (14.1)	-	38900 (14.1)	-	35100 (33.3)	-	-
LEAD	µg/L	5	ND (1) (0.047)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) (0.047)	-	-	ND (0.052) (0.052)	-	ND (0.080) (0.080)	-	0.099 J (0.080)	-	0.19 J (0.034)	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261 (0.84)	-	247 (0.44)	-	265 (0.44)	-	249 (0.83)	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.070) (0.0081)	-	-
Metals, Dissolved																														
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2.0) (0.95)	-	ND (2.0) (0.95)	-	ND (2.0) (0.95)	-	-	ND (2.0) (0.40)
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5.0) (2.3)	-	ND (5.0) (0.62)	-	ND (5.0) (0.62)	-	-	ND (5.0) (0.66)
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27000 (52.2)	-	18100 (14.1)	-	18700 (14.1)	-	-	11700 (33.3)
LEAD	µg/L	5	-	0.14 J	0.091 J	-	ND (0.050) (0.047)	ND (0.052)	ND (0.080)	-	3.5 (3.0)	-	-	ND (3) (1.7)	-	1.6 J (1.3)	0.13 J (0.082)	ND (1.0) (0.13)	-	ND (1.0) (0.13)	0.12 J (0.090)	-	ND (1.0) (0.052)	-	ND (1.0) (0.080)	-	ND (1.0) (0.080)	-	-	ND (1.0) (0.034)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	268 (0.84)	-	246 (0.44)	-	257 (0.44)	-	-	248 (0.83)
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.0081)
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																														
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	316000 (460)	-	307000 (460)	-	-	-	302000 (700)	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (460) (460)	-	ND (460) (460)	-	ND (700) (700)	-	ND (700) (700)	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	316000 (460)	-	307000 (460)	-	298000 (700)	-	302000 (700)	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	298000 (700)	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65700 (200)	-	68800 (200)	-	68500 (200)	-	71500 (200)	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25400 (200)	-	26400 (200)	-	24000 (200)	-	24000 (200)	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (250) (50)	-	ND (250) (50)	-	ND (250) (50)	-	ND (250) (50)	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1500) (300)	-	2300 J (300)	-	2000 J (300)	-	ND (1500) (300)	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (54) (54)	-	ND (54) (54)	-	ND (54) (54)	-	-	ND (54) (54)	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	340000 (9700)	-	343000 (9700)	-	375000 (9700)	-	395000 (9700)	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6600 (500)	-	8000 (500)	-	6400 (500)	-	7000 (500)	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-132D					B-133					B-133D															
Sample Date			1-Nov-12	1-Nov-12	29-Mar-13	29-Mar-13	3-May-16	9-Jan-13	9-Jan-13	5-May-16	25-Aug-16	25-Aug-16	6-Jun-06	8-Apr-11	8-Apr-11	1-Jul-11	1-Jul-11	31-May-12	31-May-12	20-Aug-12	20-Aug-12	20-Aug-12	2-Nov-12	2-Nov-12	29-Mar-13	29-Mar-13	3-May-16
Sample ID			B-132D_11112	B-132D_11112	B-132D_32913	B-132D_32913	GW-11109613-B132D-05-03-16-RM-002	B133_010913	B133_010913	GW-11109613-B133-05-05-16-RM-020	GW-11109613-B-133D-082416-AC-029	GW-11109613-B-133D-082416-AC-030	B133D-060606	B-133D_04082011	B-133D_04082011 FILTERED	B-133D_07012011	B-133D_07012011 FILTERED	B-133D_53112	B-133D_53112	B-133D_082012	B-133D_082012	B-133D_082012	B-133D_110212	B-133D_110212	B-133D_32913	B-133D_32913	GW-11109613-B133D-05-03-16-RM-004
Sampling Company			--	--	LANGAN	LANGAN	GHD	UNKNOWN	UNKNOWN	GHD	GHD	GHD	--	--	--	--	--	--	--	--	--	--	--	--	LANGAN	LANGAN	GHD
Laboratory			--	--	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	LL	LL	--	--	--	--	--	--	--	--	--	--	--	--	ACCUTEST	ACCUTEST	LL
Laboratory Work Order			MC15556	MC15556	J832843	J832843	1657425	J826467	J826467	1658374	1700681	1700681	UNKNOWN	1241585	1241585	1254489	1254489	1312987	1312987	1330298	1330298	1330298	MC15557	MC15557	J832843	J832843	1657425
Laboratory Sample ID	Units	MSC-PA	MC15556-11	MC15556-11F	J832843-2	J832843-2F	8365505	J826467-1	J826467-1F	8370275	8553522	8553523	4788101	6255430	6255431	6334730	6334731	6674597	6674598	6762327	6762328	6762329	MC15557-2	MC15557-2F	J832843-3	J832843-3F	8365507
Field Parameters																												
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	1.12	-	-	1.17	-	0.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.22
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-77	-	-	-98	-	-140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-86
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	6.13	-	-	6.46	-	6.51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.11
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	14.8	-	-	14.3	-	19.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.2
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	170	-	-	14	-	50.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69
Volatile Organic Compounds																												
BENZENE	µg/L	5	ND (0.50) (0.24)	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (0.50) (0.24)	-	ND (1.0) (0.24)	-	ND (1) (0.5)
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	*ND (2.0)* (0.50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*ND (2.0)* (0.50)	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1.0) (0.63)	-	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.63)	-	ND (1.0) (0.26)	-	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	ND (1.0) (0.51)	-	ND (1.0) (0.23)	-	ND (1) (0.5)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	ND (1.0) (0.23)	-	ND (1) (0.5)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (5.0) (0.50)	-	ND (2.0) (0.45)	-	ND (2) (0.5)	52.0 (2.0)	-	59 (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (5) (1)	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.50)	-	ND (2.0) (0.45)	-	ND (2) (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	2.0 (0.41)	-	2.1 (0.16)	-	2 (0.5)	3.2 (1.0)	-	1 (0.5)	ND (1) (0.5)	1 (0.5)	ND (5) (0.5)	2 (0.5)	-	2 (0.5)	-	2 (0.5)	-	2 (0.5)	-	-	3.3 (0.41)	-	1.6 (0.16)	-	1 (0.5)
TOLUENE	µg/L	1000	ND (1.0) (0.51)	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.7)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	ND (1.0) (0.23)	-	ND (1) (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	ND (5.0) (0.35)	-	ND (2.0) (0.19)	-	ND (2) (0.5)	3.6 (2.0)	-	0.7 J (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.35)	-	ND (2.0) (0.19)	-	ND (2) (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (5.0) (0.47)	-	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.47)	-	ND (2.0) (0.36)	-	ND (2) (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (1.0) (0.58)	-	ND (1.0) (0.24)	-	ND (1) (0.5)	9.1 (1.0)	-	2 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.58)	-	ND (1.0) (0.24)	-	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																												
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.015) (0.010)	-	ND (0.020) (0.011)	-	ND (0.028) (0.0094)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.029) (0.010)	ND (0.028) (0.0095)	ND (0.029) (0.010)	-	ND (0.0096) (0.010)	-	ND (0.0098) (0.010)	-	ND (0.0097) (0.010)	-	-	ND (0.015) (0.010)	-	ND (0.020) (0.011)	-	ND (0.029) (0.0095)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	ND (0.015) (0.013)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.015) (0.013)	-	-	-	-
Semi-Volatile Organic Compounds																												
ANTHRACENE	µg/L	66	0.055 J (0.018)	-	ND (0.10) (0.020)	-	0.088 (0.010)	5.66 (1.0)	-	11 (0.10)	ND (0.050) (0.010)	0.18 (0.010)	-	-	-	-	-	-	-	0.2 J (0.1)	-	-	0.10 B (0.018)	-	0.133 (0.020)	-	0.18 (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	ND (0.051) (0.030)	-	ND (0.10) (0.012)	-	0.018 J (0.010)	0.866 (0.10)	-	1.7 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.050) (0.030)	-	ND (0.10) (0.012)	-	0.024 J (0.010)
BENZO(A)PYRENE	µg/L	0.2	ND (0.10) (0.018)	-	ND (0.10) (0.012)	-	0.017 J (0.010)	***0.245 (0.10)***	-	***0.72 (0.10)***	ND (0.050) (0.010)	ND (0.050) (0.010)	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.017)	-	ND (0.10) (0.012)	-	0.017 J (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	ND (0.051) (0.024)	-	ND (0.10) (0.010)	-	0.018 J (0.010)	0.193 (0.10)	-	0.81 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.050) (0.024)	-	ND (0.10) (0.010)	-	0.015 J (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	ND (0.10) (0.038)	-	ND (0.10) (0.016)	-	0.013 J (0.010)	ND (0.10) (0.10)	-	0.23 J (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.038)	-	ND (0.10) (0.016)	-	0.010 J (0.010)
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	ND (0.10) (0.073)	-	ND (0.10) (0.012)	-	0.015 J (0.010)	0.663 (0.10)	-	1.3 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	*ND (5)* (1)	*ND (5)* (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.073)	-	ND (0.10) (0.012)	-	0.021 J (0.010)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	ND (0.10) (0.047)	-	ND (0.10) (0.017)	-	0.018 J (0.010)	26.4 (1.0)	-	33 (0.10)	ND (0.050) (0.010)	0.014 J (0.010)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.046)	-	ND (0.10) (0.017)	-	0.030 J (0.010)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	0.047 J (0.036)	-	ND (0.10) (0.036)	-	0.082 (0.030)	1.41 (0.10)	-	ND (0.61) (0.30)	0.039 J (0.030)	ND (0.060) (0.030)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.036)	-	ND (0.10) (0.036)	-	ND (0.060) (0.030)
PHENANTHRENE	µg/L	1100	0.17 (0.013)	-	0.180 (0.021)	-	0.18 (0.030)	32.7 (1.0)	-	56 (0.30)	ND (0.060) (0.030)	0.55 (0.030)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	0.7 (0.1)	-	0.6 (0.1)	-	-	0.48 (0.013)	-	0.415 (0.021)	-	0.49 (0.030)
PYRENE	µg/L	130	ND (0.10) (0.036)	-	ND (0.10) (0.015)	-	0.033 J (0.010)	4.45 (0.10)	-	7.4 (0.10)	ND (0.050) (0.010)	ND (0.050) (0.010)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.036)	-	ND (0.10) (0.015)	-	0.047 J (0.010)
Metals																												
ARSENIC	µg/L	10	2.4 J (1.9)	-	3.5 (0.97)	-	-	-	-	-	-	-	-	9.5 (0.95)	-	***10.9 (0.95)***	-	9.7 (0.95)	-	***11.2 (0.40)***	-	-	7.6 (1.9)	-	***10.2 (0.97)***	-	-
COBALT	µg/L	35	*ND (50)* (0.40)	-	*ND (50)* (0.59)	-	-	-	-	-	-	-	-	ND (5.0) (2.3)	-	2.4 J (0.62)	-	2.5 J (0.62)	-	2.7 J (0.66)	-	-	2.3 J (0.40)	-	1.1 J (0.59)	-	-
IRON	µg/L	n/v	39600 (11)	-	37100 (24)	-	-	-	-	-	-	-	-	35300 (52.2)	-	33200 (14.1)	-	34800 (14.1)	-	33000 (33.3)	-	-	38500 (11)	-	35600 (24)	-	-
LEAD	µg/L	5	ND (5.0) (2.1)	-	***5.8 (1.7)***	-	-	-	-	-	-	-	ND (1) (0.047)	ND (1.0) (0.052)	-	0.12 J (0.080)	-	ND (0.080) (0.080)	-	0.45 J (0.034)	-	-	ND (5.0) (2.1)	-	***8.5 (1.7)***	-	-
MANGANESE	µg/L	300	283 (0.54)	-	275 (0.40)	-	-	-	-	-	-	-	-	220 (0.84)	-	210 (0.44)	-	233 (0.44)	-	225 (0.83)	-	-	291 (0.54)	-	249 (0.40)	-	-
MERCURY	µg/L	2	ND (0.20) (0.062)	-	ND (0.20) (0.095)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.070) (0.0081)	-	-	ND (0.20) (0.062)	-	ND (0.20) (0.095)	-	-
Metals, Dissolved																												
ARSENIC	µg/L	10	-	ND (4.0) (1.9)	-	2.0 J (0.97)	-	-	-	-	-	-	-	-	ND (2.0) (0.95)	-	2.7 (0.95)	-	3.2 (0.95)	-	-	2.1 (0.40)	-	4.0 (1.9)	-	5.6 (0.97)	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	*ND (50)* (0.40)	-	*ND (50)* (0.59)	-	-	-	-	-	-	-	-	ND (5.0) (2.3)	-	ND (5.0) (0.62)	-	ND (5.0) (0.62)	-	-	ND (5.0) (0.66)	-	2.1 J (0.40)	-	0.80 J (0.59)	-
IRON	µg/L	n/v	-	29100 (11)	-	28400 (24)	-	-	-	-	-	-	-	-	11100 (52.2)	-	14300 (14.1)	-	19200 (14.1)	-	-	11200 (33.3)	-	26900 (11)	-	24600 (24)	-
LEAD	µg/L	5	-	ND (5.0) (2.1)	-	***6.4 (1.7)***	ND (1.0) (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	0.48 J (0.090)	ND (1.0) (0.090)	-	-	ND (1.0) (0.052)	-	ND (1.0) (0.080)	-	ND (1.0) (0.080)	-	-	ND (1.0) (0.034)	-	ND (5.0) (2.1)	-	***6.0 (1.7)***	1.4 (0.13)
MANGANESE	µg/L	300	-	264 (0.54)	-	274 (0.40)	-	-	-	-	-	-	-	-	197 (0.84)	-	199 (0.44)	-	229 (0.44)	-	-	204 (0.83)	-	278 (0.54)	-	229 (0.40)	-
MERCURY	µg/L	2	-	ND (0.20) (0.062)	-	ND (0.20) (0.095)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.0081)	-	ND (0.20) (0.062)	-	ND (0.20) (0.095)	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																												
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	296000 (460)	-	293000 (460)	-	-	-	286000 (700)	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	ND (2000) (460)	-	ND (460) (460)	-	ND (700) (700)	-	ND (700) (700)	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	348000 (5000)	-	295000 (5000)	-	-	-	-	-	-	-	-	296000 (460)	-	293000 (460)	-	295000 (700)	-	286000 (700)	-	-	338000 (5000)	-	286000 (5000)	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	348000 (5000)	-	298000 (2800)	-	-	-	-	-	-	-	-	-	-	-	-	295000 (700)	-	-	-	-	338000 (5000)	-	287000 (2800)	-	-
CHLORIDE (AS CL)	µg/L	n/v	75200 (1000)	-	75500 (48)	-	-	-	-	-	-	-	-	67300 (200)	-	66200 (200)	-	70600 (200)	-	82600 (200)	-	-	76200 (1000)	-	89600 (48)	-	-
FLUORIDE	µg/L	4000	200 (100)	-	170 B (5.1)	-	-	-	-	-	-	-	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	130 (100)	-	160 B (5.1)	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	260 (100)	-	24400 (1500)	-	-	-	-	-	-	-	-	28000 (200)	-	25200 (200)	-	26800 (200)	-	25900 (200)	-	-	28900 (2000)	-	26600 (1500)	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	220 (110)	-	ND (110) (5.6)	-	-	-	-	-	-	-	-	ND (500) (50)	-	ND (250) (50)	-	300 J (50)	-	ND (250) (50)	-	-	ND (110) (110)	-	ND (110) (5.6)	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	220 (100)	-	ND (100) (4.6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100) (100)	-	ND (100) (4.6)	-	-
NITROGEN, NITRITE	µg/L	1000	ND (10) (10.0)	-	ND (10) (1)	-	-	-	-	-	-	-	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	ND (10) (10.0)	-	ND (10) (1)	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	ND (5000) (5000)	-	ND (10000) (380)	-	-	-	-	-	-	-	-	ND (5000) (300)	-	2300 J (300)	-	3600 J (300)	-	ND (1500) (300)	-	-	ND (5000) (5000)	-	ND (10000) (380)	-	-
SULFIDE	µg/L	n/v	ND (2000) (2000)	-	410 B (280)	-	-	-	-	-	-	-	-	ND (160) (54)	-	ND (54) (54)	-	ND (54) (54)	-	-	ND (54) (54)	-	ND (2000) (2000)	-	680 B (280)	-	-
TOTAL CARBON	µg/L	n/v	5900 (1000)	-	6200 (240)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8100 (1000)	-	6300 (240)	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	353000 (10000)	-	302000 (1800)	-	-	-	-	-	-	-	-	328000 (9700)	-	344000 (9700)	-	369000 (9700)	-	376000 (9700)	-	-	318000 (10000)	-	367000 (1800)	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	7200 (500)	-	8700 (500)	-	7700 (500)	-	7600 (500)	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-134			B-134D																					B-135	
Sample Date			9-Jan-13	9-Jan-13	11-May-16	24-May-05	6-Jun-06	8-Apr-11	8-Apr-11	1-Jul-11	1-Jul-11	31-May-12	31-May-12	20-Aug-12	20-Aug-12	20-Aug-12	2-Nov-12	2-Nov-12	5-Feb-13	5-Feb-13	5-Feb-13	5-Feb-13	1-Apr-13	1-Apr-13	3-May-16	3-May-16	9-Jan-13	9-Jan-13
Sample ID			B134_010913	B134_010913	GW-11109613-B134-05-11-16-MM-041	B134D-052405	B134D-060606	B-134D_04082011	B-134D_04082011 FILTERED	B-134D_07012011	B-134D_07012011 FILTERED	B-134D_53112	B-134D_53112	B-134D_082012	B-134D_082012	B-134D_082012	B-134D_110212	B-134D_110212	B-134D_020513	B-134D_020513	B-134D_020513	B-134D_020513	B-134D_40113	B-134D_40113	GW-11109613-B134D-05-03-16-AC-001	GW-11109613-DUP1-05-03-16-AC-003	B135_010913	B135_010913
Sampling Company			UNKNOWN	UNKNOWN	GHD	--	--	--	--	--	--	--	--	--	--	--	--	--	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LANGAN	LANGAN	GHD	GHD	UNKNOWN	UNKNOWN
Laboratory			ACCUTEST	ACCUTEST	LL	--	--	--	--	--	--	--	--	--	--	--	--	--	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST
Laboratory Work Order			JB26467	JB26467	1660120	UNKNOWN	UNKNOWN	1241585	1241585	1254489	1254489	1312987	1312987	1330298	1330298	1330298	MC15557	MC15557	JB28204	JB28204	JB28204R	JB28204R	JB32976	JB32976	1657425	1657425	JB26467	JB26467
Laboratory Sample ID	Units	MSC-PA	JB26467-2	JB26467-2F	8378037	4532021	4788099	6255422	6255423	6334732	6334733	6674595	6674596	6762318	6762319	6762320	MC15557-3	MC15557-3F	JB28204-2	JB28204-2F	JB28204-2FR	JB28204-2R	JB32976-8	JB32976-8F	8365504	8365506	JB26467-3	JB26467-3F
Field Parameters																												
CONDUCTIVITY	mS/cm	n/v	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.698	0.698	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.17	2.17	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-76	-76	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.63	6.63	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.95	14.95	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.2	50.2	-	-
Volatile Organic Compounds																												
BENZENE	µg/L	5	ND (1.0) (1.0)	-	2 (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (0.50) (0.24)	-	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	2.9 (1.0)	-
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*ND (2.0)* (0.50)	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.63)	-	-	-	-	-	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
ETHYLBENZENE	µg/L	700	1.9 (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	3.2 (1.0)	-
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	67.8 (2.0)	-	100 (0.5)	ND (5) (1)	ND (5) (1)	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.50)	-	-	-	-	-	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	33.6 (2.0)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	2.5 (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	2 (0.5)	-	1 (0.5)	-	2 (0.5)	-	2 (0.5)	-	-	3.4 (0.41)	-	-	-	-	-	1.8 (0.16)	-	2 (0.5)	1 (0.5)	ND (1.0) (1.0)	-
TOLUENE	µg/L	1000	ND (1.0) (1.0)	-	0.6 J (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	-	-	-	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	1.9 (1.0)	-
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	4.7 (2.0)	-	ND (2) (0.5)	-	-	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.35)	-	-	-	-	-	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	4.3 (2.0)	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	2.0 (2.0)	-	0.7 J (0.5)	-	-	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.47)	-	-	-	-	-	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	2.0 (2.0)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	11.2 (1.0)	-	0.5 J (0.5)	ND (5) (0.8)	ND (5) (0.8)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.58)	-	-	-	-	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	17.7 (1.0)	-
Volatile Organic Compounds (SW8011)																												
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.029) (0.0096)	ND (0.028) (0.0094)	ND (0.029) (0.010)	-	ND (0.0096) (0.010)	-	ND (0.0097) (0.010)	-	ND (0.0097) (0.010)	-	-	ND (0.015) (0.010)	-	-	-	-	-	ND (0.020) (0.011)	-	ND (0.029) (0.0095)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.015) (0.013)	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																												
ANTHRACENE	µg/L	66	5.26 (1.0)	-	2.0 (0.010)	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.018)	-	-	-	-	-	ND (0.10) (0.020)	-	0.069 (0.010)	0.039 J (0.010)	9.34 (1.0)	-
BENZO(A)ANTHRACENE	µg/L	4.9	0.148 (0.10)	-	0.46 (0.010)	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	0.18 (0.030)	-	-	-	-	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	0.011 J (0.010)	***7.94 (1.0)***	-
BENZO(A)PYRENE	µg/L	0.2	ND (0.10) (0.10)	-	***0.25 (0.010)***	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.017)	-	-	-	-	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	0.012 J (0.010)	***4.02 (0.10)***	-
BENZO(B)FLUORANTHENE	µg/L	1.2	ND (0.10) (0.10)	-	0.30 (0.010)	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	0.068 (0.024)	-	-	-	-	-	ND (0.10) (0.010)	-	ND (0.051) (0.010)	0.013 J (0.010)	***4.35 (0.10)***	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	ND (0.10) (0.10)	-	0.075 (0.010)	-	-	-	-	-	-	-	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.038)	-	-	-	-	-	ND (0.10) (0.016)	-	ND (0.051) (0.010)	0.017 J (0.010)	***1.46 (0.10)***	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	0.121 (0.10)	-	0.39 (0.010)	*ND (10)* (1)	*ND (5)* (1)	*ND (5)* (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.073)	-	-	-	-	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.051) (0.010)	***4.87 (0.10)***	-
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	31.9 (1.0)	-	8.7 (0.010)	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.046)	-	-	-	-	-	ND (0.10) (0.017)	-	0.012 J (0.010)	0.011 J (0.010)	37.6 (1.0)	-
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	0.964 (0.10)	-	ND (0.062) (0.031)	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	ND (0.10) (0.036)	-	-	-	-	-	ND (0.10) (0.036)	-	ND (0.061) (0.030)	ND (0.061) (0.030)	1.86 (0.10)	-
PHENANTHRENE	µg/L	1100	29.0 (1.0)	-	7.1 (0.031)	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	0.3 J (0.1)	-	0.2 J (0.1)	-	-	0.19 (0.013)	-	-	-	-	-	0.162 (0.021)	-	0.27 (0.030)	0.27 (0.030)	32.7 (1.0)	-
PYRENE	µg/L	130	1.93 (0.10)	-	1.8 (0.010)	ND (10) (1)	ND (5) (1)	ND (5) (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	ND (0.09) (0.1)	-	-	0.044 J (0.036)	-	-	-	-	-	ND (0.10) (0.015)	-	0.017 J (0.010)	0.020 J (0.010)	19.6 (1.0)	-
Metals																												
ARSENIC	µg/L	10	-	-	-	-	-	3.9 (0.95)	-	4.3 (0.95)	-	4.1 (0.95)	-	5.4 (0.40)	-	-	2.6 J (1.9)	-	ND (3.0) (3.0)	-	-	-	5.5 (0.97)	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	ND (5.0) (2.3)	-	0.73 J (0.62)	-	0.79 J (0.62)	-	1.7 J (0.66)	-	-	1.8 J (0.40)	-	*ND (50)* (0.59)	-	-	-	*ND (50)* (0.59)	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	36600 (52.2)	-	35200 (14.1)	-	33800 (14.1)	-	50500 (33.3)	-	-	39400 (11)	-	27600 (100)	-	-	-	33300 (24)	-	-	-	-	-
LEAD	µg/L	5	-	-	-	ND (1) (0.18)	ND (1) (0.047)	ND (1.0) (0.052)	-	ND (0.080) (0.080)	-	ND (0.080) (0.080)	-	1.9 (0.034)	-	-	ND (5.0) (2.1)	-	ND (3.0) (3.0)	-	-	-	***7.3 (1.7)***	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	245 (0.84)	-	247 (0.44)	-	230 (0.44)	-	***460 (0.83)***	-	-	***369 (0.54)***	-	284 (15)	-	-	-	238 (0.40)	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	ND (0.070) (0.0081)	-	-	ND (0.20) (0.062)	-	-	-	-	ND (0.20) (0.20)	ND (0.20) (0.089)	-	-	-	-	-
Metals, Dissolved																												
ARSENIC	µg/L	10	-	-	-	-	-	-	ND (2.0) (0.95)	-	ND (2.0) (0.95)	-	ND (2.0) (0.95)	-	-	ND (2.0) (0.40)	-	ND (4.0) (1.9)	-	ND (3.0) (3.0)	-	-	-	2.0 J (0.97)	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	ND (5.0) (2.3)	-	ND (5.0) (0.62)	-	ND (5.0) (0.62)	-	-	ND (5.0) (0.66)	-	0.70 J (0.40)	-	*ND (50)* (50)	-	-	-	0.90 J (0.59)	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	7170 (52.2)	-	15300 (14.1)	-	19200 (14.1)	-	-	17200 (33.3)	-	19100 (11)	-	22000 (100)	-	-	-	9890 (24)	-	-	-	-
LEAD	µg/L	5	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	-	-	ND (1.0) (0.052)	-	ND (1.0) (0.080)	-	ND (1.0) (0.080)	-	-	ND (1.0) (0.034)	-	ND (5.0) (2.1)	-	ND (3.0) (3.0)	-	-	-	***6.6 (1.7)***	0.14 J (0.13)	0.14 J (0.13)	-	ND (3.0) (3.0)
MANGANESE	µg/L	300	-	-	-	-	-	-	229 (0.84)	-	235 (0.44)	-	227 (0.44)	-	-	***371 (0.83)***	-	293 (0.54)	-	***1850 (15)***	-	-	-	219 (0.40)	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.0081)	-	ND (0.20) (0.062)	-	-	ND (0.20) (0.20)	-	-	ND (0.20) (0.089)	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																												
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	301000 (460)	-	308000 (460)	-	-	-	314000 (700)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	ND (2000) (460)	-	ND (460) (460)	-	ND (700) (700)	-	ND (700) (700)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	301000 (460)	-	308000 (460)	-	296000 (700)	-	314000 (700)	-	-	349000 (5000)	-	-	-	-	-	416000 (5000)	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	296000 (700)	-	-	-	-	349000 (5000)	-	-	-	-	-	417000 (3500)	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	52600 (200)	-	51200 (200)	-	54100 (200)	-	54800 (200)	-	-	57200 (1000)	-	-	-	-	-	56800 (48)	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	120 (100)	-	-	-	-	-	160 B (5.1)	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	***30500 (200)***	-	28900 (200)	-	29700 (200)	-	***32000 (200)***	-	-	***33400 (2000)***	-	-	-	-	-	***31700 (1600)***	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	ND (500) (50)	-	ND (250) (50)	-	ND (250) (50)	-	ND (250) (50)	-	-	190 (110)	-	-	-	-	-	19 B (5.6)	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190 (100)	-	-	-	-	-	19 B (4.6)	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	ND (10) (10.0)	-	-	-	-	-	ND (10) (1)	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	ND (5000) (300)	-	ND (1500) (300)	-	ND (1500) (300)	-	ND (1500) (300)	-	-	ND (5000) (5000)	-	-	-	-	-	ND (10000) (380)	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	ND (160) (54)	-	ND (54) (54)	-	ND (54) (54)	-	-	ND (54) (54)	-	ND (2000) (2000)	-	-	-	-	-	540 B (280)	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7700 (1000)	-	-	-	-	-	5900 (240)	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	297000 (9700)	-	320000 (9700)	-	294000 (9700)	-	343000 (9700)	-	-	288000 (10000)	-	-	-	-	-	285000 (1800)	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	7700 (500)	-	9500 (500)	-	7800 (500)	-	11000 (500)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-144			B-145						B-148		B-149						B-150				B-151			B-152				
Sample Date			8-Jan-13	8-Jan-13	11-May-16	26-May-05	9-Jun-06	8-Jan-13	8-Jan-13	9-May-16	24-Aug-16	17-Oct-02	19-Nov-02	17-Oct-02	19-Nov-02	25-May-05	9-Jun-06	7-Jan-13	7-Jan-13	17-Oct-02	19-Nov-02	11-May-16	24-Aug-16	8-Jun-06	7-Jan-13	7-Jan-13	9-Jun-06	7-Jan-13	7-Jan-13	9-May-16	9-May-16
Sample ID			B144_010813	B144_010813	GW-11109613-B144-05-11-16-AC-044	B145-052605	B145-060906	B145_010813	B145_010813	GW-11109613-B145-05-09-16-AC-029	GW-11109613-B-145-082416-KC-016	MW-1	MW-1	MW-2	MW-2	B149-052505	B149-060806	B-149_010713	B-149_010713	MW-3	MW-3	GW-11109613-B150-05-11-16-AC-046	GW-11109613-B-150-082416-AC-019	B151-060806	B-151_010713	B-151_010713	B152-060906	B-152_010713	B-152_010713	GW-11109613-B152-05-09-16-AC-025	GW-11109613-DUP3-05-09-16-AC-027
Sampling Company			UNKNOWN	UNKNOWN	GHD	--	--	UNKNOWN	UNKNOWN	GHD	GHD	--	--	--	--	--	--	UNKNOWN	UNKNOWN	--	--	GHD	GHD	--	UNKNOWN	UNKNOWN	--	UNKNOWN	UNKNOWN	GHD	GHD
Laboratory			ACCUTEST	ACCUTEST	LL	--	--	ACCUTEST	ACCUTEST	LL	LL	--	--	--	--	--	--	ACCUTEST	ACCUTEST	--	--	LL	LL	--	ACCUTEST	ACCUTEST	--	ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order			JB25963	JB25963	1660120	UNKNOWN	UNKNOWN	JB25963	JB25963	1659064	1700681	827401	831613	827401	831613	UNKNOWN	UNKNOWN	JB25835	JB25835	827401	831613	1660120	1700681	UNKNOWN	JB25835	JB25835	UNKNOWN	JB25835	JB25835	1659064	1659064
Laboratory Sample ID	Units	MSC-PA	JB25963-2	JB25963-2F	8378040	4533807	4790636	JB25963-3	JB25963-3F	8373134	8553508	3922244	3944152	3922245	3944153	4532843	4790629	JB25835-2	JB25835-2F	3922246	3944154	8378042	8553511	4790625	JB25835-3	JB25835-3F	4790631	JB25835-4	JB25835-4F	8373130	8373132
Field Parameters																															
CONDUCTIVITY	mS/cm	n/v	-	-	NM	-	-	-	-	0.272	0.24	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-	-	-	-	0.433	0.433
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	NM	-	-	-	-	2.38	3.06	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-	-	-	-	1.96	1.96
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	NM	-	-	-	-	-120	-169	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-	-	-	-	-108	-108
pH, FIELD MEASURED	S.U.	n/v	-	-	NM	-	-	-	-	7.28	7.35	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-	-	-	-	6.69	6.69
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	NM	-	-	-	-	16.32	23.4	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-	-	-	-	15.65	15.65
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	NM	-	-	-	-	17.5	0	-	-	-	-	-	-	-	-	-	-	NM	-	-	-	-	-	-	-	12.1	12.1
Volatile Organic Compounds																															
BENZENE	µg/L	5	***77.5 (1.0)***	-	***130 (1)***	***38 (0.5)***	***43 (0.5)***	***18.0 (1.0)***	-	***6 (0.5)***	***6 (0.5)***	***32***	***61***	***28000***	***52000***	***140000 (500)***	***79000 (250)***	***47400 (500)***	-	***610000***	***500000***	***480000 (10000)***	***320000 (0.5)***	ND (5) (0.5)	***15.2 (1.0)***	-	***78 (0.5)***	***38.8 (1.0)***	-	***42 (0.5)***	***39 (0.5)***
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (5) (3)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	-	-	-	-	*ND (5000)* (1000)	*ND (250)* (50)	*ND (200)* (200)	-	-	-	*ND (200)* (100)	*ND (50)* (0.5)	ND (5) (1)	ND (1.0) (1.0)	-	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	101 (1.0)	-	260 (3)	ND (5) (0.8)	ND (5) (0.8)	2.3 (1.0)	-	1 (0.5)	1 (0.5)	ND (5)	7	ND (250)	*ND (1000)*	*ND (5000)* (800)	ND (250) (40)	ND (200) (200)	-	*ND (5000)*	*ND (5000)*	320 (100)	270 (0.5)	ND (5) (0.8)	1.3 (1.0)	-	ND (5) (0.8)	3.5 (1.0)	-	3 (0.5)	3 (0.5)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	60.0 (2.0)	-	35 (3)	62 (1)	78 (1)	58.8 (2.0)	-	77 (0.5)	74 (0.5)	16	12	2000	1800	*ND (5000)* (1000)	810 (50)	1750 (400)	-	*ND (5000)*	*ND (5000)*	***12000 (100)***	***7500 (0.5)***	ND (5) (1)	15.6 (2.0)	-	94 (1)	104 (2.0)	-	120 (0.5)	110 (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (1.0) (1.0)	-	ND (5) (3)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5)	ND (5)	*ND (250)*	*ND (1000)*	*ND (5000)* (500)	*ND (250)* (25)	*ND (200)* (200)	-	*ND (5000)*	*ND (5000)*	*ND (200)* (100)	*ND (50)* (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (5) (0.5)	1.6 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)
TOLUENE	µg/L	1000	35.6 (1.0)	-	74 (3)	5 (0.7)	ND (5) (0.7)	2.9 (1.0)	-	2 (0.5)	2 (0.5)	5	ND (5)	ND (250)	ND (1000)	*ND (5000)* (700)	***2200 (35)***	357 (200)	-	***59000***	***62000***	***55000 (1000)***	***33000 (0.5)***	ND (5) (0.7)	4.4 (1.0)	-	6 (0.7)	16.8 (1.0)	-	16 (0.5)	15 (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	***212 (10)***	-	***460 (3)***	-	-	2.9 (2.0)	-	1 J (0.5)	1 J (0.5)	-	-	-	-	-	-	*ND (400)* (400)	-	-	-	*ND (400)* (100)	***76 J (0.5)***	-	ND (2.0) (2.0)	-	-	6.0 (2.0)	-	5 (0.5)	4 (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	64.4 (2.0)	-	140 (3)	-	-	2.0 (2.0)	-	1 J (0.5)	2 J (0.5)	-	-	-	-	-	-	ND (400) (400)	-	-	-	ND (400) (100)	31 J (0.5)	-	ND (2.0) (2.0)	-	-	4.7 (2.0)	-	3 (0.5)	3 (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	506 (5.0)	-	1600 (3)	13 (0.8)	11 (0.8)	8.1 (1.0)	-	6 (0.5)	6 (0.5)	ND (5)	7	ND (250)	ND (1000)	ND (5000) (800)	ND (250) (40)	ND (200) (200)	-	ND (5000)	ND (5000)	1400 (100)	1100 (0.5)	ND (5) (0.8)	6.2 (1.0)	-	5 (0.8)	29.0 (1.0)	-	28 (0.5)	25 (0.5)
Volatile Organic Compounds (SW8011)																															
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.029) (0.0096)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.030) (0.0099)	ND (0.028) (0.010)	-	-	-	-	ND (0.029) (0.0096)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	-	-	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.029) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.029) (0.0097)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																															
ANTHRACENE	µg/L	66	0.270 (0.10)	-	5.4 (0.10)	-	-	4.92 (0.10)	-	7.4 (0.010)	13 (0.010)	-	-	-	-	-	-	1.33 (0.10)	-	-	-	0.86 (0.10)	0.15 J (0.010)	-	0.522 (0.10)	-	-	1.41 (0.10)	-	2.6 (0.010)	2.1 (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	ND (0.10) (0.10)	-	2.0 (0.10)	-	-	0.397 (0.10)	-	0.68 (0.010)	0.67 (0.010)	-	-	-	-	-	-	0.193 (0.10)	-	-	-	0.52 (0.10)	0.10 J (0.010)	-	ND (0.10) (0.10)	-	-	ND (0.10) (0.10)	-	0.12 (0.010)	0.14 (0.010)
BENZO(A)PYRENE	µg/L	0.2	ND (0.10) (0.10)	-	***1.2 (0.10)***	-	-	0.141 (0.10)	-	***0.33 (0.010)***	***0.22 (0.010)***	-	-	-	-	-	-	0.122 (0.10)	-	-	-	***0.40 (0.10)***	*ND (0.50)* (0.010)	-	ND (0.10) (0.10)	-	-	ND (0.10) (0.10)	-	0.088 (0.010)	0.11 (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	ND (0.10) (0.10)	-	***1.6 (0.10)***	-	-	0.137 (0.10)	-	0.36 (0.010)	0.29 (0.010)	-	-	-	-	-	-	ND (0.10) (0.10)	-	-	-	0.53 (0.10)	ND (0.50) (0.010)	-	ND (0.10) (0.10)	-	-	ND (0.10) (0.10)	-	0.11 (0.010)	0.13 (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	ND (0.10) (0.10)	-	***0.42 J (0.10)***	-	-	ND (0.10) (0.10)	-	0.11 (0.010)	0.071 (0.010)	-	-	-	-	-	-	ND (0.10) (0.10)	-	-	-	0.22 J (0.10)	*ND (0.50)* (0.010)	-	ND (0.10) (0.10)	-	-	ND (0.10) (0.10)	-	0.058 (0.010)	0.081 (0.010)
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	ND (0.10) (0.10)	-	***2.0 (0.10)***	*ND (10)* (1)	*ND (5)* (1)	0.341 (0.10)	-	0.47 (0.010)	0.49 (0.010)	-	-	-	-	*ND (10)* (1)	*ND (5)* (1)	0.141 (0.10)	-	-	-	0.53 (0.10)	ND (0.50) (0.010)	*ND (5)* (1)	ND (0.10) (0.10)	-	*ND (5)* (1)	ND (0.10) (0.10)	-	0.13 (0.010)	0.14 (0.010)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	2.14 (0.10)	-	1.1 (0.10)	41 (1)	50 (1)	19.4 (1.0)	-	34 (0.10)	50 (0.010)	-	-	-	-	ND (10) (1)	ND (5) (1)	4.66 (0.10)	-	-	-	2.8 (0.10)	0.90 (0.010)	ND (5) (1)	1.64 (0.10)	-	7 (1)	4.72 (0.10)	-	2.3 (0.010)	2.3 (0.010)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	4.01 (0.10)	-	19 (0.30)	11 (1)	11 (1)	3.40 (0.10)	-	4.4 (0.030)	3.3 (0.030)	ND (5)	ND (5)	*ND (250)*	*ND (1000)*	32 (1)	7 (1)	27.7 (1.0)	-	*ND (5000)*	*ND (5000)*	52 (0.31)	31 (0.030)	ND (5) (1)	0.453 (0.10)	-	ND (5) (1)	1.46 (0.10)	-	ND (0.060) (0.030)	ND (0.061) (0.030)
PHENANTHRENE	µg/L	1100	0.917 (0.10)	-	6.6 (0.30)	24 (1)	43 (1)	11.7 (1.0)	-	23 (0.30)	41 (0.030)	-	-	-	-	ND (10) (1)	ND (5) (1)	7.35 (1.0)	-	-	-	4.5 (0.31)	1.2 (0.030)	ND (5) (1)	0.114 (0.10)	-	ND (5) (1)	2.30 (0.10)	-	4.9 (0.030)	3.8 (0.030)
PYRENE	µg/L	130	0.123 (0.10)	-	4.3 (0.10)	14 (1)	12 (1)	2.79 (0.10)	-	4.2 (0.010)	5.4 (0.010)	-	-	-	-	ND (10) (1)	ND (5) (1)	1.01 (0.10)	-	-	-	0.93 (0.10)	0.15 J (0.010)	ND (5) (1)	0.433 (0.10)	-	ND (5) (1)	1.04 (0.10)	-	1.5 (0.010)	1.6 (0.010)
Metals																															
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	-	-	-	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	-	-	-	ND (1) (0.047)	-	-	ND (1) (0.047)	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																															
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	4.2 (3.0)	0.24 J (0.13)	-	-	-	3.7 (3.0)	0.70 J (0.13)	0.13 J (0.090)	-	-	-	-	-	-	-	ND (3.0) (3.0)	-	-	ND (1.0) (0.13)	0.12 J (0.090)	-	-	ND (3.0) (3.0)	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	ND (1.0) (0.13)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																															
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-153				B-154				B-155				B-156			B-157	B-158												
Sample Date			9-Jun-06	4-Jan-13	4-Jan-13	4-May-16	8-Jun-06	7-Jan-13	7-Jan-13	10-May-16	8-Jun-06	7-Jan-13	7-Jan-13	5-May-16	7-Jan-13	7-Jan-13	10-May-16	9-Jun-06	8-Jun-06	9-Nov-10	16-Nov-11	7-Jan-13	7-Jan-13	8-Apr-13	8-Apr-13	8-Apr-13	2-Jun-14	2-Jun-14	20-May-15	9-May-16	22-Aug-16
Sample ID			B153-060906	B-153_010413	B-153_010413	GW-11109613-B153-05-04-16-RM-010	B154-060806	B-154_010713	B-154_010713	GW-11109613-B154-05-10-16-MM-038	B155-060806	B-155_010713	B-155_010713	GW-11109613-B155-05-05-16-AC-013	B-156_010713	B-156_010713	GW-11109613-B154-05-10-16-MM-036	B157-060906	B158-060806	B-158	B-158	B-158_010713	B-158_010713	B-158	B-158_040813	B-158_040813	B-158	B-158	B-158_20150520	GW-11109613-B158-05-09-16-AC-033	GW-11109613-B-158-082216-AC-002
Sampling Company			--	UNKNOWN	UNKNOWN	GHD	--	UNKNOWN	UNKNOWN	GHD	--	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	GHD	--	--	--	--	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	GHD	GHD
Laboratory			--	ACCUTEST	ACCUTEST	LL	--	ACCUTEST	ACCUTEST	LL	--	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	LL	--	--	--	--	ACCUTEST	ACCUTEST	UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory Work Order			UNKNOWN	J825728	J825728	1657425	UNKNOWN	J825835	J825835	1660120	UNKNOWN	J825835	J825835	1658374	J825835	J825835	1660120	UNKNOWN	UNKNOWN	20140718EZ	20140718EZ	J825835	J825835	20140718EZ	J833644	J833644	J868336	J868336	1562821	1659064	1699628
Laboratory Sample ID	Units	MSC-PA	4790630	J825728-4	J825728-4F	8365513	4790626	J825835-5	J825835-5F	8378043	4790628	J825835-6	J825835-6F	8370268	J825835-7	J825835-7F	8378032	4790638	4790620	UNKNOWN	UNKNOWN	J825835-8	J825835-8F	UNKNOWN	J833644-14	J833644-14F	J868336-15	J868336-15F	7896251	8373138	8548678
Field Parameters																															
CONDUCTIVITY	mS/cm	n/v	-	-	-	1.17	-	-	-	0.246	-	-	-	0.593	-	-	0.629	-	-	-	-	-	-	-	-	-	-	-	-	0.376	0.4
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	0.41	-	-	-	2.46	-	-	-	2.56	-	-	19.15	-	-	-	-	-	-	-	-	-	-	-	2.01	6.95	1.68
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-38	-	-	-	-71	-	-	-	-70	-	-	-90	-	-	-	-	-	-	-	-	-	-	-	52	-70	-88
pH, FIELD MEASURED	S.U.	n/v	-	-	-	6.8	-	-	-	7.21	-	-	-	6.56	-	-	6.93	-	-	-	-	-	-	-	-	-	-	-	8.04	7.65	7.59
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.479	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	13.9	-	-	-	13.21	-	-	-	15.61	-	-	14.02	-	-	-	-	-	-	-	-	-	-	-	14.94	15.33	26.06
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.644	-	-	-	-	-	-	-	-	NM	-	-
TURBIDITY	NTU	n/v	-	-	-	0	-	-	-	0	-	-	-	57.3	-	-	284	-	-	-	-	-	-	-	-	-	-	-	141	15.5	0
Volatile Organic Compounds																															
BENZENE	µg/L	5	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	***450000 (1000)***	***238000 (5000)***	-	***51000 (1000)***	***280000 (1000)***	***77800 (500)***	-	***120000 (1000)***	***301 (5.0)***	-	***49 (0.5)***	***68 (0.5)***	ND (5) (0.5)	ND (0.5)	***180***	ND (1.0) (1.0)	-	-	ND (1) (0.24)	-	ND (0.50) (0.21)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0097)	ND (0.0096)	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	*ND (1000)* (200)	*ND (1000)* (1000)	-	*ND (200)* (100)	*ND (1000)* (200)	*ND (500)* (500)	-	*ND (50)* (25)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (0.5)	ND (1)	ND (1.0) (1.0)	-	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (1.0) (1.0)	-	ND (1) (0.5)	*ND (1000)* (160)	*ND (1000)* (1000)	-	ND (200) (100)	*ND (1000)* (160)	ND (500) (500)	-	120 (25)	5.5 (1.0)	-	4 (0.5)	14 (0.8)	ND (5) (0.8)	ND (0.5)	13	ND (1.0) (1.0)	-	-	ND (1) (0.23)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	9 (1)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (1000) (200)	ND (2000) (2000)	-	150 J (100)	ND (1000) (200)	ND (1000) (1000)	-	79 J (25)	101 (2.0)	-	120 (0.5)	6 (1)	ND (5) (1)	ND (0.5)	2 J	ND (2.0) (2.0)	-	-	ND (2) (0.45)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	*ND (1000)* (100)	*ND (1000)* (1000)	-	*ND (200)* (100)	*ND (1000)* (100)	*ND (500)* (500)	-	*ND (50)* (25)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (0.5)	ND (1)	ND (1.0) (1.0)	-	-	ND (1) (0.16)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (1.0) (1.0)	-	ND (1) (0.5)	***6200 (140)***	***1100 (1000)***	-	180 J (100)	ND (1000) (140)	ND (500) (500)	-	820 (25)	21.0 (1.0)	-	13 (0.5)	40 (0.7)	ND (5) (0.7)	ND (0.5)	250	ND (1.0) (1.0)	-	-	ND (1) (0.23)	-	ND (1.0) (0.22)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	573	-	-	ND	-	-	-	-	ND	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	ND (2.0) (2.0)	-	ND (2) (0.5)	-	*ND (2000)* (2000)	-	*ND (400)* (100)	-	*ND (1000)* (1000)	-	62 J (25)	5.5 (2.0)	-	4 (0.5)	-	-	ND (0.5)	4 J	ND (2.0) (2.0)	-	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	ND (2.0) (2.0)	-	ND (2) (0.5)	-	*ND (2000)* (2000)	-	ND (400) (100)	-	ND (1000) (1000)	-	ND (100) (25)	5.6 (2.0)	-	5 (0.5)	-	-	ND (0.5)	3 J	ND (2.0) (2.0)	-	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	1.4 (1.0)	-	ND (1) (0.5)	ND (1000) (160)	ND (1000) (1000)	-	ND (200) (100)	ND (1000) (160)	ND (500) (500)	-	150 (25)	33.2 (1.0)	-	22 (0.5)	79 (0.8)	ND (5) (0.8)	ND (0.5)	130	ND (1.0) (1.0)	-	-	ND (1) (0.24)	-	ND (1.0) (0.20)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																															
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0095)	ND (0.029) (0.0097)	ND (0.020) (0.020)	-	ND (0.029) (0.0095)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.029) (0.0095)	ND (0.029) (0.0096)	-	-	ND (0.020) (0.020)	-	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-	ND (0.0095) (0.010)	ND (0.029) (0.0096)	ND (0.028) (0.010)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																															
ANTHRACENE	µg/L	66	-	0.190 (0.10)	-	0.099 (0.010)	-	3.10 (0.10)	-	1.5 (0.010)	-	1.74 (0.10)	-	3.7 (0.010)	1.79 (0.10)	-	4.7 (0.010)	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.02)	-	ND (0.10) (0.020)	-	ND (0.1) (0.1)	0.027 J (0.010)	0.037 J (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	-	ND (0.10) (0.10)	-	0.052 (0.010)	-	ND (0.10) (0.10)	-	0.12 (0.010)	-	ND (0.10) (0.10)	-	0.31 (0.010)	0.184 (0.10)	-	1.7 (0.010)	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.058 (0.010)	0.055 (0.010)
BENZO(A)PYRENE	µg/L	0.2	-	ND (0.10) (0.10)	-	0.038 J (0.010)	-	ND (0.10) (0.10)	-	0.10 (0.010)	-	ND (0.10) (0.10)	-	***0.25 (0.010)***	ND (0.10) (0.10)	-	***1.4 (0.010)***	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.045 J (0.010)	0.042 J (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	-	ND (0.10) (0.10)	-	0.040 J (0.010)	-	ND (0.10) (0.10)	-	0.084 (0.010)	-	ND (0.10) (0.10)	-	0.24 (0.010)	ND (0.10) (0.10)	-	***1.5 (0.010)***	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.01)	-	ND (0.10) (0.010)	-	ND (0.1) (0.1)	0.051 (0.010)	0.046 J (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	ND (0.10) (0.10)	-	0.018 J (0.010)	-	ND (0.10) (0.10)	-	0.054 (0.010)	-	ND (0.10) (0.10)	-	0.088 (0.010)	ND (0.10) (0.10)	-	***0.50 (0.010)***	-	-	-	-	ND (0.10) (0.10)	-	-	ND (0.1) (0.016)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	0.029 J (0.010)	0.027 J (0.010)
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	*ND (5)* (1)	ND (0.10) (0.10)	-	0.058 (0.010)	*ND (5)* (1)	ND (0.10) (0.10)	-	0.099 (0.010)	*ND (5)* (1)	ND (0.10) (0.10)	-	0.27 (0.010)	0.161 (0.10)	-	1.4 (0.010)	***6 (1)***	*ND (5)* (1)	ND (1)	0.35	ND (0.10) (0.10)	-	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.051 (0.010)	0.045 J (0.010)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	ND (5) (1)	0.192 (0.10)	-	0.018 J (0.010)	21 (1)	15.8 (1.0)	-	7.0 (0.010)	10 (1)	6.74 (1.0)	-	6.6 (0.010)	8.16 (1.0)	-	10 (0.010)	14 (1)	ND (5) (1)	ND (1)	0.23 J	ND (0.10) (0.10)	-	-	ND (0.1) (0.017)	-	ND (0.10) (0.017)	-	ND (0.1) (0.1)	0.064 (0.010)	0.094 (0.010)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (5) (1)	0.466 (0.10)	-	ND (0.061) (0.030)	76 (1)	57.3 (1.0)	-	20 (0.31)	29 (1)	52.4 (1.0)	-	42 (0.61)	1.65 (0.10)	-	3.3 (0.031)	ND (5) (1)	ND (5) (1)	ND (1)	ND (0.96)	0.155 (0.10)	-	-	ND (0.1) (0.036)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	0.042 J (0.030)	0.078 (0.030)
PHENANTHRENE	µg/L	1100	ND (5) (1)	ND (0.10) (0.10)	-	0.043 J (0.030)	18 (1)	17.0 (1.0)	-	4.9 (0.031)	14 (1)	8.73 (1.0)	-	12 (0.61)	9.87 (1.0)	-	17 (0.31)	25 (1)	ND (5) (1)	ND (1)	0.19 J	ND (0.10) (0.10)	-	-	ND (0.1) (0.021)	-	ND (0.10) (0.021)	-	ND (0.1) (0.1)	0.040 J (0.030)	0.043 J (0.030)
PYRENE	µg/L	130	ND (5) (1)	0.213 (0.10)	-	0.27 (0.010)	ND (5) (1)	0.983 (0.10)	-	0.51 (0.010)	ND (5) (1)	0.746 (0.10)	-	1.3 (0.010)	0.883 (0.10)	-	3.4 (0.010)	20 (1)	ND (5) (1)	1 J	0.80	0.196 (0.10)	-	-	ND (0.1) (0.015)	-	0.126 (0.015)	-	0.2 J (0.1)	0.22 (0.010)	0.31 (0.010)
Metals																															
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	ND (1) (0.047)	-	-	-	ND (1) (0.047)	-	-	-	ND (1) (0.047)	-	-	-	-	-	-	***16.6 (0.047)***	ND (1) (0.047)	ND	-	-	-	-	-	-	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																															
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	194	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	-	0.072 J	0.10 J	-	ND (3.0) (3.0)	-	-	ND (3) (1.7)	-	1.7 J (1.3)	0.14 J (0.082)	1.2 (0.13)	0.99 J (0.09)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																															
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	616000	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23300	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1970	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3540	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.49	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13400	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32000	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-159	B-160			B-162				B-163				B-164					B-165						B-166	
Sample Date			8-Jun-06	8-Jun-06	7-Jan-13	7-Jan-13	10-Aug-06	4-Jan-13	4-Jan-13	10-May-16	9-Jun-06	7-Jan-13	7-Jan-13	10-May-16	6-Jun-06	8-Jan-13	8-Jan-13	9-May-16	23-Aug-16	4-Jan-13	4-Jan-13	3-Jun-14	3-Jun-14	20-May-15	5-May-16	7-Jan-13	7-Jan-13
Sample ID			B159-060806	B160-060806	B160_010713	B160_010713	B162-081006	B162_010413	B162_010413	GW-11109613-B162-05-10-16-AC-039	B163-060906	B-163_010713	B-163_010713	GW-11109613-B163-05-10-16-AC-037	B164-060606	B164_010813	B164_010813	GW-11109613-B164-05-09-16-AC-031	GW-11109613-B-164-082316-KC-014	B-165_010413	B-165_010413	B-165	B-165	B-165_20150520	GW-11109613-B165-05-05-16-AC-015	B166_010713	B166_010713
Sampling Company			--	--	UNKNOWN	UNKNOWN	--	UNKNOWN	UNKNOWN	GHD	--	UNKNOWN	UNKNOWN	GHD	--	UNKNOWN	UNKNOWN	GHD	GHD	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	GHD	UNKNOWN	UNKNOWN
Laboratory			--	--	ACCUTEST	ACCUTEST	--	ACCUTEST	ACCUTEST	LL	--	ACCUTEST	ACCUTEST	LL	--	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	ACCUTEST	ACCUTEST
Laboratory Work Order			UNKNOWN	UNKNOWN	J825834	J825834	UNKNOWN	J825729	J825729	1660120	UNKNOWN	J825835	J825835	1660120	UNKNOWN	J825964	J825964	1659064	1699628	J825728	J825728	J868336	J868336	1562821	1658374	J825834	J825834
Laboratory Sample ID	Units	MSC-PA	4790624	4790623	J825834-4	J825834-4F	4840111	J825729-3	J825729-3F	8378035	4790635	J825835-9	J825835-9F	8378033	4788111	J825964-3	J825964-3F	8373136	8548691	J825728-1	J825728-1F	J868336-19	J868336-19F	7896252	8370270	J825834-2	J825834-2F
Field Parameters																											
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	0.658	-	-	-	0.391	-	-	-	0.406	0.48	-	-	-	-	-	0.687	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	-	-	33.3	-	-	-	26.08	-	-	-	10.51	15.59	-	-	-	-	1.12	1.1	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-	-	-74	-	-	-	-83	-	-	-	120	53	-	-	-	-	-115	-122	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	-	-	6.31	-	-	-	6.92	-	-	-	7.74	7.33	-	-	-	-	7.79	7.07	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	-	-	14.49	-	-	-	17.36	-	-	-	15.53	21.5	-	-	-	-	18.25	15.68	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.663	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	-	-	90.1	-	-	-	0	-	-	-	105	20.6	-	-	-	-	32.4	23.4	-	-
Volatile Organic Compounds																											
BENZENE	µg/L	5	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	*ND (25)* (3)	ND (1.0) (1.0)	-	ND (1) (0.5)	***4800 (25)***	***373 (5.0)***	-	0.9 J (0.5)	ND (5) (0.5)	***99.1 (1.0)***	-	ND (1) (0.5)	1 (0.5)	ND (1.0) (1.0)	-	ND (0.50) (0.21)	-	ND (0.5) (0.5)	4 (0.5)	ND (1.0) (1.0)	-
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	*ND (25)* (5)	ND (1.0) (1.0)	-	ND (1) (0.5)	*ND (25)* (5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (5) (0.8)	4.1 (1.0)	-	ND (25) (4)	1.7 (1.0)	-	ND (1) (0.5)	ND (25) (4)	1.8 (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (1) (0.5)	1.1 (1.0)	-
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (5) (1)	ND (5) (1)	2.9 (2.0)	-	ND (25) (5)	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (25) (5)	3.5 (2.0)	-	ND (2) (0.5)	7 (1)	7.2 (2.0)	-	5 (0.5)	5 (0.5)	3.0 (2.0)	-	3.4 (0.26)	-	6 (0.5)	5 (0.5)	2.1 (2.0)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	*ND (25)* (3)	ND (1.0) (1.0)	-	ND (1) (0.5)	*ND (25)* (3)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	0.34 J (0.26)	-	0.6 J (0.5)	2 (0.5)	ND (1.0) (1.0)	-
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (5) (0.7)	1.7 (1.0)	-	ND (25) (4)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (25) (4)	6.4 (1.0)	-	ND (1) (0.5)	ND (5) (0.7)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.22)	-	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	-	7.9 (2.0)	-	-	3.3 (2.0)	-	ND (2) (0.5)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	0.23 J (0.19)	-	ND (0.5) (0.5)	ND (2) (0.5)	2.3 (2.0)	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	-	2.2 (2.0)	-	-	ND (2.0) (2.0)	-	ND (2) (0.5)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (2.0)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	ND (5) (0.8)	15.3 (1.0)	-	ND (25) (4)	6.3 (1.0)	-	ND (1) (0.5)	ND (25) (4)	3.5 (1.0)	-	ND (1) (0.5)	ND (5) (0.8)	1.2 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (0.20)	-	ND (0.5) (0.5)	ND (1) (0.5)	3.9 (1.0)	-
Volatile Organic Compounds (SW8011)																											
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0096)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.020) (0.020)	-	ND (0.020) (0.011)	-	ND (0.0096) (0.010)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																											
ANTHRACENE	µg/L	66	-	-	ND (10) (10)	-	-	ND (1.0) (1.0)	-	0.62 (0.010)	-	0.156 (0.10)	-	0.044 J (0.010)	-	ND (0.10) (0.10)	-	0.026 J (0.010)	0.057 (0.010)	0.790 (0.10)	-	0.416 (0.020)	-	0.6 (0.1)	0.48 (0.010)	ND (0.10) (0.10)	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	*ND (10)* (10)	-	-	ND (1.0) (1.0)	-	0.41 (0.010)	-	ND (0.10) (0.10)	-	0.097 (0.010)	-	ND (0.10) (0.10)	-	0.027 J (0.010)	0.017 J (0.010)	0.223 (0.10)	-	0.196 (0.012)	-	0.2 J (0.1)	0.17 (0.010)	ND (0.10) (0.10)	-
BENZO(A)PYRENE	µg/L	0.2	-	-	*ND (10)* (10)	-	-	*ND (1.0)* (1.0)	-	***0.32 (0.010)***	-	ND (0.10) (0.10)	-	0.090 (0.010)	-	ND (0.10) (0.10)	-	0.047 J (0.010)	0.019 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	0.039 J (0.010)	ND (0.10) (0.10)	-
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	*ND (10)* (10)	-	-	ND (1.0) (1.0)	-	0.34 (0.010)	-	ND (0.10) (0.10)	-	0.17 (0.010)	-	ND (0.10) (0.10)	-	0.049 J (0.010)	0.021 J (0.010)	ND (0.10) (0.10)	-	0.124 (0.010)	-	0.1 J (0.1)	0.050 J (0.010)	ND (0.10) (0.10)	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	*ND (10)* (10)	-	-	*ND (1.0)* (1.0)	-	0.17 (0.010)	-	ND (0.10) (0.10)	-	0.064 (0.010)	-	ND (0.10) (0.10)	-	0.035 J (0.010)	0.018 J (0.010)	ND (0.10) (0.10)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	0.025 J (0.010)	ND (0.10) (0.10)	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	*ND (5)* (1)	*ND (5)* (1)	*ND (10)* (10)	-	*ND (5)* (1)	ND (1.0) (1.0)	-	0.47 (0.010)	*ND (5)* (1)	ND (0.10) (0.10)	-	0.13 (0.010)	*ND (5)* (1)	ND (0.10) (0.10)	-	0.027 J (0.010)	0.013 J (0.010)	0.148 (0.10)	-	0.134 (0.012)	-	0.2 J (0.1)	0.13 (0.010)	ND (0.10) (0.10)	-
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	9 (1)	ND (5) (1)	ND (10) (10)	-	ND (5) (1)	1.51 (1.0)	-	1.4 (0.010)	35 (1)	8.24 (1.0)	-	1.2 (0.010)	ND (5) (1)	0.184 (0.10)	-	0.081 (0.010)	0.069 (0.010)	2.03 (0.10)	-	1.67 (0.017)	-	2 (0.1)	1.4 (0.010)	0.420 (0.10)	-
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (5) (1)	ND (5) (1)	ND (10) (10)	-	ND (5) (1)	ND (1.0) (1.0)	-	0.61 (0.030)	ND (5) (1)	0.491 (0.10)	-	ND (0.061) (0.031)	ND (5) (1)	0.304 (0.10)	-	ND (0.062) (0.031)	0.037 J (0.030)	1.29 (0.10)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	ND (0.063) (0.031)	0.438 (0.10)	-
PHENANTHRENE	µg/L	1100	ND (5) (1)	ND (5) (1)	ND (10) (10)	-	ND (5) (1)	ND (1.0) (1.0)	-	0.56 (0.030)	20 (1)	0.170 (0.10)	-	0.037 J (0.031)	ND (5) (1)	ND (0.10) (0.10)	-	ND (0.062) (0.031)	0.045 J (0.030)	0.446 (0.10)	-	0.223 (0.021)	-	0.1 J (0.1)	0.37 (0.031)	ND (0.10) (0.10)	-
PYRENE	µg/L	130	ND (5) (1)	ND (5) (1)	ND (10) (10)	-	ND (5) (1)	ND (1.0) (1.0)	-	1.1 (0.010)	ND (5) (1)	0.177 (0.10)	-	0.27 (0.010)	ND (5) (1)	0.123 (0.10)	-	0.043 J (0.010)	0.047 J (0.010)	1.65 (0.10)	-	1.14 (0.015)	-	2 (0.1)	1.2 (0.010)	0.135 (0.10)	-
Metals																											
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	ND (1) (0.047)	ND (1) (0.047)	-	-	ND (1) (0.047)	-	-	-	ND (1) (0.047)	-	-	-	5 (0.047)	-	-	-	-	-	-	-	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																											
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	ND (3.0) (3.0)	-	-	ND (3.0) (3.0)	0.31 J (0.13)	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	-	ND (3.0) (3.0)	1.1 (0.13)	1.9 (0.09)	-	ND (3.0) (3.0)	-	1.4 J (1.3)	0.11 J (0.082)	1.0 (0.13)	-	ND (3.0) (3.0)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																											
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			B-167		B-168			B-169						B-170			B-172			B-173		B-174		B-175	
Sample Date			7-Jan-13	7-Jan-13	4-Jan-13	4-Jan-13	4-May-16	4-Jan-13	4-Jan-13	9-Jan-13	9-Jan-13	9-May-16	22-Aug-16	5-May-16	5-May-16	22-Aug-16	5-May-16	23-Aug-16	23-Aug-16	5-May-16	23-Aug-16	5-May-16	22-Aug-16	11-May-16	23-Aug-16
Sample ID			B167_010713	B167_010713	B-168_010413	B-168_010413	GW-11109613-B168-05-04-16-AC-009	B-169_010413	B-169_010413	B-169_010913	B-169_010913	GW-11109613-B169-05-09-16-MM-024	GW-11109613-B-169-082216-KC-001	GW-11109613-B170-05-05-16-AC-017	GW-11109613-DUP2-05-05-16-AC-019	GW-11109613-B-170-082216-KC-003	GW-11109613-B172-05-05-16-AC-021	GW-11109613-B-172-082316-AC-009	GW-11109613-B-172D-082316-AC-011	GW-11109613-B173-05-05-16-RM-018	GW-11109613-B-173-082316-KC-012	GW-11109613-B174-05-05-16-RM-016	GW-11109613-B-174-082216-KC-007	GW-11109613-B175-05-11-16-MM-045	GW-11109613-B-175-082316-AC-015
Sampling Company			UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory			ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order			J825834	J825834	J825728	J825728	1657425	J825728	J825728	J826465	J826465	1659064	1699628	1658374	1658374	1699628	1658374	1699628	1699628	1658374	1699628	1658374	1699628	1660120	1699628
Laboratory Sample ID	Units	MSC-PA	J825834-3	J825834-3F	J825728-2	J825728-2F	8365512	J825728-3	J825728-3F	J826465-4	J826465-4F	8373129	8548677	8370272	8370274	8548679	8370276	8548686	8548688	8370273	8548689	8370271	8548683	8378041	8548692
Field Parameters																									
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	0.472	-	-	-	-	0.317	0.58	0.596	0.596	0.55	418	0.45	0.45	1.64	1.56	1.57	1.66	NM	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	9.68	-	-	-	-	19.8	14.4	1.17	1.17	6.44	2.38	4.72	4.72	0	1.61	0	3.26	NM	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-67	-	-	-	-	-135	-207	-125	-125	-157	-25	-99	-99	-96	-146	-92	-133	NM	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	7.35	-	-	-	-	7.11	6.75	8.27	8.27	6.76	7.2	7.07	7.07	6.47	6.61	7.02	6.85	NM	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	13.65	-	-	-	-	14.25	21.8	14.25	14.25	21.7	13.44	24.7	24.7	13	20.7	12.6	24.6	NM	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	13.1	-	-	-	-	14	8.9	0	0	9.4	26.6	10.9	10.9	130	0	2	49.2	NM	-
Volatile Organic Compounds																									
BENZENE	µg/L	5	***10.2 (1.0)***	-	ND (1.0) (1.0)	-	ND (1) (0.5)	***5.2 (1.0)***	-	***6.4 (1.0)***	-	0.7 J (0.5)	ND (1) (0.5)	5 (0.5)	5 (0.5)	3 (0.5)	***13 (0.5)***	***160 (0.5)***	***160 (0.5)***	***14 (5)***	***17 (0.5)***	ND (1) (0.5)	ND (1) (0.5)	***260 (3)***	***65 (0.5)***
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	*ND (10)* (5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (3)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	3.9 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	1.8 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	4 (0.5)	ND (1) (0.5)	ND (1) (0.5)	25 (3)	5 (0.5)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	81.6 (2.0)	-	3.8 (2.0)	-	2 J (0.5)	8.3 (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	6 (0.5)	5 (0.5)	5 (0.5)	7 (0.5)	ND (10) (0.5)	ND (10) (0.5)	27 (5)	33 (0.5)	ND (2) (0.5)	ND (2) (0.5)	150 (3)	63 (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1.0) (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	ND (1) (0.5)	5 (0.5)	7 (0.5)	ND (5) (3)	ND (1) (0.5)
TOLUENE	µg/L	1000	4.5 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	2.0 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	5 J (5)	5 (0.5)	ND (1) (0.5)	ND (1) (0.5)	70 (3)	15 (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	4.0 (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	4.7 (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (10) (0.5)	ND (10) (0.5)	ND (20) (5)	5 (0.5)	ND (2) (0.5)	ND (2) (0.5)	4 J (3)	2 J (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2.0) (2.0)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (10) (0.5)	ND (10) (0.5)	13 J (5)	14 (0.5)	ND (2) (0.5)	ND (2) (0.5)	51 (3)	10 (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	17.4 (1.0)	-	2.0 (1.0)	-	0.5 J (0.5)	6.3 (1.0)	-	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	2 (0.5)	1 (0.5)	0.7 J (0.5)	0.6 J (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (10) (5)	8 (0.5)	ND (1) (0.5)	ND (1) (0.5)	33 (3)	11 (0.5)
Volatile Organic Compounds (SW8011)																									
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	ND (0.028) (0.0094)	ND (0.020) (0.020)	-	ND (0.020) (0.020)	-	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.029) (0.0095)	ND (0.029) (0.0096)	ND (0.029) (0.010)	ND (0.029) (0.0097)	ND (0.028) (0.010)	ND (0.028) (0.010)	0.020 J (0.0097)	ND (0.028) (0.010)	ND (0.029) (0.0095)	ND (0.028) (0.010)	ND (0.029) (0.0096)	ND (0.028) (0.010)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																									
ANTHRACENE	µg/L	66	ND (0.10) (0.10)	-	0.503 (0.10)	-	0.52 (0.010)	0.377 (0.10)	-	0.217 (0.10)	-	0.084 (0.010)	ND (0.057) (0.010)	0.36 (0.010)	0.37 (0.010)	0.26 (0.010)	0.33 (0.010)	0.33 J (0.010)	0.10 J (0.010)	6.0 (0.10)	6.1 (0.010)	0.096 (0.010)	0.095 (0.010)	1.7 (0.010)	0.78 (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	ND (0.10) (0.10)	-	0.254 (0.10)	-	0.066 (0.010)	0.197 (0.10)	-	0.187 (0.10)	-	0.17 (0.010)	0.013 J (0.010)	0.10 (0.010)	0.10 (0.010)	0.065 (0.010)	0.49 (0.010)	0.27 J (0.010)	0.13 J (0.010)	2.1 (0.10)	1.2 (0.010)	0.048 J (0.010)	0.080 (0.010)	1.3 (0.010)	0.36 (0.010)
BENZO(A)PYRENE	µg/L	0.2	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.037 J (0.010)	ND (0.10) (0.10)	-	***0.227 (0.10)***	-	0.17 (0.010)	0.015 J (0.010)	0.11 (0.010)	0.090 (0.010)	0.043 J (0.010)	***0.45 (0.010)***	0.18 J (0.010)	0.092 J (0.010)	***1.0 (0.10)***	***0.51 J (0.010)***	0.032 J (0.010)	0.060 J (0.010)	***0.89 (0.010)***	***0.27 J (0.010)***
BENZO(B)FLUORANTHENE	µg/L	1.2	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.038 J (0.010)	ND (0.10) (0.10)	-	0.222 (0.10)	-	0.19 (0.010)	0.020 J (0.010)	0.12 (0.010)	0.088 (0.010)	0.044 J (0.010)	0.50 (0.010)	0.18 J (0.010)	0.094 J (0.010)	1.0 (0.10)	0.55 J (0.010)	0.038 J (0.010)	0.065 J (0.010)	1.1 (0.010)	0.27 J (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	ND (0.10) (0.10)	-	ND (0.10) (0.10)	-	0.016 J (0.010)	ND (0.10) (0.10)	-	0.173 (0.10)	-	0.12 (0.010)	0.016 J (0.010)	0.047 J (0.010)	0.043 J (0.010)	0.020 J (0.010)	0.19 (0.010)	0.085 J (0.010)	0.041 J (0.010)	0.25 J (0.10)	0.12 J (0.010)	0.015 J (0.010)	0.034 J (0.010)	***0.38 (0.010)***	0.096 J (0.010)
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	ND (0.10) (0.10)	-	0.190 (0.10)	-	0.063 (0.010)	0.131 (0.10)	-	0.268 (0.10)	-	0.17 (0.010)	0.017 J (0.010)	0.11 (0.010)	0.11 (0.010)	0.069 (0.010)	0.51 (0.010)	0.25 (0.010)	0.15 (0.010)	1.4 (0.10)	0.90 (0.010)	0.042 J (0.010)	0.081 (0.010)	1.2 (0.010)	0.33 (0.010)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	0.316 (0.10)	-	3.09 (0.10)	-	2.1 (0.010)	1.98 (0.10)	-	0.527 (0.10)	-	0.043 J (0.010)	ND (0.057) (0.010)	2.5 (0.010)	2.3 (0.010)	0.61 (0.010)	0.42 (0.010)	0.56 J (0.010)	0.23 J (0.010)	16 (0.10)	18 (0.010)	0.25 (0.010)	0.27 (0.010)	5.9 (0.010)	3.2 (0.010)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	2.08 (0.10)	-	1.38 (0.10)	-	ND (0.061) (0.030)	41.7 (0.10)	-	0.165 (0.10)	-	0.071 (0.030)	ND (0.069) (0.030)	2.3 (0.031)	4.8 (0.031)	ND (0.068) (0.030)	0.27 (0.031)	ND (0.061) (0.030)	ND (0.064) (0.030)	13 (0.31)	12 (0.030)	0.099 (0.030)	0.083 (0.030)	ND (0.061) (0.030)	ND (0.062) (0.030)
PHENANTHRENE	µg/L	1100	0.289 (0.10)	-	0.172 (0.10)	-	0.92 (0.030)	1.44 (0.10)	-	0.296 (0.10)	-	0.069 (0.030)	ND (0.069) (0.030)	1.3 (0.031)	1.8 (0.031)	0.99 (0.030)	0.38 (0.031)	0.26 J (0.030)	0.036 J (0.030)	23 (0.31)	22 (0.030)	0.43 (0.030)	0.48 (0.030)	8.7 (0.030)	3.5 (0.030)
PYRENE	µg/L	130	ND (0.10) (0.10)	-	1.07 (0.10)	-	0.41 (0.010)	0.646 (0.10)	-	0.587 (0.10)	-	0.27 (0.010)	0.035 J (0.010)	0.35 (0.010)	0.34 (0.010)	0.31 (0.010)	1.4 (0.010)	1.0 (0.010)	0.86 (0.010)	6.4 (0.10)	4.8 (0.010)	0.19 (0.010)	0.33 (0.010)	2.3 (0.010)	0.93 (0.010)
Metals																									
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																									
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	ND (3.0) (3.0)	-	ND (3.0) (3.0)	ND (1.0) (0.13)	-	ND (3.0) (3.0)	-	ND (3.0) (3.0)	***33.8 (0.13)***	***6.5 (0.09)***	ND (1.0) (0.13)	ND (1.0) (0.13)	ND (1.0) (0.09)	0.18 J (0.13)	0.30 J (0.09)	0.25 J (0.09)	0.75 J (0.13)	1.4 (0.09)	ND (1.0) (0.13)	1.9 (0.09)	***6.9 (0.13)***	3.1 (0.09)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																									
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			C-134D																U-1	U-2	U-4					U-5	URS-1
Sample Date			20-Jul-10	8-Apr-11	8-Apr-11	1-Jul-11	1-Jul-11	31-May-12	31-May-12	20-Aug-12	20-Aug-12	20-Aug-12	2-Nov-12	2-Nov-12	1-Apr-13	1-Apr-13	20-Jul-16	19-Aug-16	6-Jun-06	6-Jun-06	6-Jun-06	9-Jan-13	9-Jan-13	5-May-16	22-Aug-16	6-Jun-06	6-Jun-06
Sample ID			C-134D_072010	C-134D_04082011	C-134D_04082011 FILTERED	C-134D_07012011	C-134D_07012011 FILTERED	C-134D_53112	C-134D_53112	C-134D_082012	C-134D_082012	C-134D_082012	C-134D_110212	C-134D_110212	C-134D_40113	C-134D_40113	GW-11109614-C-134D-072016-AC-002	GW-11109614-C134D-081916-AC-02	U1-060606	U2-060606	U4-060606	U4_010913	U4_010913	GW-11109613-U4-05-05-16-AC-022	GW-11109613-U-4-082216-AC-004	U5-060606	URS1-060606
Sampling Company			--	--	--	--	--	--	--	--	--	--	--	--	LANGAN	LANGAN	GHD	GHD	--	--	--	UNKNOWN	UNKNOWN	GHD	GHD	--	--
Laboratory			--	--	--	--	--	--	--	--	--	--	--	--	ACCUTEST	ACCUTEST	LL	LL	--	--	--	ACCUTEST	ACCUTEST	LL	LL	--	--
Laboratory Work Order			1204282	1241585	1241585	1254489	1254489	1312987	1312987	1330298	1330298	1330298	MC15557	MC15557	J832976	J832976	1686199	1698036	UNKNOWN	UNKNOWN	UNKNOWN	J826467	J826467	1658374	1699628	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	6039474	6255432	6255433	6334736	6334737	6674605	6674606	6762315	6762316	6762317	MC15557-4	MC15557-4F	J832976-6	J832976-6F	8489350	8541532	4788103	4788104	4788105	J826467-4	J826467-4F	8370277	8548680	4788106	4788108
Field Parameters																											
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.725	-	-	-	-	-	-	0.597	0.66	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.83	-	-	-	-	-	-	2.6	2.76	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-48	-	-	-	-	-	-	-103	-153	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.58	-	-	-	-	-	-	7.59	7.56	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.45	-	-	-	-	-	-	13.7	28.07	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76.4	-	-	-	-	-	-	3.7	0	-	-
Volatile Organic Compounds																											
BENZENE	µg/L	5	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (0.50) (0.24)	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (5) (0.5)	1.4 (1.0)	-	2 (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	*ND (2.0)* (0.50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.63)	-	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (5) (1)
ETHYLBENZENE	µg/L	700	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	ND (5) (0.8)	1.7 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (0.5) (0.5)	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.50)	-	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	ND (5) (1)	ND (5) (1)	ND (5) (1)	3.4 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	ND (5) (1)	ND (5) (1)
METHYL TERTIARY BUTYL ETHER	µg/L	20	1 (0.5)	1 (0.5)	-	0.7 J (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	2.3 (0.41)	-	0.92 J (0.16)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	8 (0.5)
TOLUENE	µg/L	1000	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.51)	-	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.7)	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-	0.9 J (0.5)	ND (1) (0.5)	ND (5) (0.7)	ND (5) (0.7)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	0.5 J (0.5)	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.35)	-	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	-	-	-	2.9 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	-	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (0.5) (0.5)	ND (2) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (5.0) (0.47)	-	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	-	-	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	ND (0.5) (0.5)	-	-	ND (1.0) (0.58)	-	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)	ND (5) (0.8)	8.3 (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (5) (0.8)
Volatile Organic Compounds (SW8011)																											
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.0097) (0.010)	ND (0.029) (0.010)	-	ND (0.0096) (0.010)	-	ND (0.0098) (0.010)	-	ND (0.0097) (0.010)	-	-	ND (0.015) (0.011)	-	ND (0.020) (0.011)	-	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.0095)	ND (0.029) (0.0096)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-	ND (0.029) (0.0095)	ND (0.028) (0.010)	ND (0.028) (0.0095)	ND (0.029) (0.0096)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	ND (0.015) (0.013)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																											
ANTHRACENE	µg/L	66	-	-	-	-	-	-	-	ND (0.1) (0.1)	-	-	ND (0.10) (0.018)	-	ND (0.10) (0.020)	-	0.011 J (0.010)	ND (0.050) (0.010)	-	-	-	1.18 (0.10)	-	0.058 (0.010)	0.32 J (0.010)	-	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	-	-	-	-	-	0.1 J (0.1)	-	-	ND (0.050) (0.030)	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	-	-	-	0.997 (0.10)	-	0.42 (0.010)	0.99 (0.010)	-	-
BENZO(A)PYRENE	µg/L	0.2	-	-	-	-	-	-	-	ND (0.1) (0.1)	-	-	ND (0.10) (0.017)	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	-	-	-	***0.686 (0.10)***	-	***0.78 (0.010)***	***2.7 J (0.010)***	-	-
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	-	-	-	-	-	ND (0.1) (0.1)	-	-	ND (0.050) (0.024)	-	ND (0.10) (0.010)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	-	-	-	0.350 (0.10)	-	0.33 (0.010)	1.1 J (0.010)	-	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	-	-	-	-	-	ND (0.1) (0.1)	-	-	ND (0.10) (0.038)	-	ND (0.10) (0.016)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	-	-	-	***0.344 (0.10)***	-	***0.44 (0.010)***	***2.4 J (0.010)***	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	ND (1) (1)	*ND (5)* (1)	-	ND (1) (1)	-	ND (0.09) (0.1)	-	0.2 J (0.1)	-	-	ND (0.10) (0.073)	-	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	***810 (10)***	*ND (5)* (1)	*ND (5)* (1)	1.59 (0.10)	-	1.1 (0.010)	***4.5 (0.010)***	*ND (5)* (1)	*ND (5)* (1)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	ND (1) (1)	ND (5) (1)	-	2 J (1)	-	0.3 J (0.1)	-	0.1 J (0.1)	-	-	0.075 J (0.046)	-	ND (0.10) (0.017)	-	0.075 (0.010)	ND (0.050) (0.010)	550 (10)	ND (5) (1)	ND (5) (1)	1.91 (0.10)	-	0.085 (0.010)	0.22 J (0.010)	ND (5) (1)	ND (5) (1)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (1) (1)	ND (5) (1)	-	1 J (1)	-	0.5 J (0.1)	-	0.2 J (0.1)	-	-	0.099 J (0.036)	-	ND (0.10) (0.036)	-	ND (0.061) (0.030)	ND (0.060) (0.030)	60 (10)	ND (5) (1)	ND (5) (1)	0.692 (0.10)	-	ND (0.062) (0.031)	9.3 (0.030)	ND (5) (1)	ND (5) (1)
PHENANTHRENE	µg/L	1100	ND (1) (1)	ND (5) (1)	-	2 J (1)	-	0.2 J (0.1)	-	0.3 J (0.1)	-	-	0.062 (0.013)	-	ND (0.10) (0.021)	-	ND (0.061) (0.030)	ND (0.060) (0.030)	1100 (10)	ND (5) (1)	ND (5) (1)	3.29 (0.10)	-	ND (0.062) (0.031)	ND (0.60) (0.030)	ND (5) (1)	ND (5) (1)
PYRENE	µg/L	130	ND (1) (1)	ND (5) (1)	-	ND (1) (1)	-	0.1 J (0.1)	-	0.4 J (0.1)	-	-	0.053 J (0.036)	-	ND (0.10) (0.015)	-	0.033 J (0.010)	ND (0.050) (0.010)	***2600 (50)***	ND (5) (1)	ND (5) (1)	2.59 (0.10)	-	1.1 (0.010)	2.9 (0.010)	ND (5) (1)	ND (5) (1)
Metals																											
ARSENIC	µg/L	10	-	***10.7 (0.95)***	-	5.8 (0.95)	-	2.2 (0.95)	-	4.5 (0.40)	-	-	6.3 (1.9)	-	4.9 (0.97)	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	ND (5.0) (2.3)	-	0.76 J (0.62)	-	ND (0.62) (0.62)	-	ND (0.66) (0.66)	-	-	0.50 J (0.40)	-	*ND (50)* (0.59)	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	8100 (52.2)	-	649 (14.1)	-	2880 (14.1)	-	13100 (33.3)	-	-	46800 (11)	-	17100 (24)	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	1.1 (0.052)	-	0.16 J (0.080)	-	ND (0.080) (0.080)	-	0.067 J (0.034)	-	-	ND (5.0) (2.1)	-	***5.7 (1.7)***	-	-	-	ND (1) (0.047)	ND (1) (0.047)	ND (1) (0.047)	-	-	-	-	3.6 (0.047)	ND (1) (0.047)
MANGANESE	µg/L	300	-	***374 (0.84)***	-	43.0 (0.44)	-	***823 (0.44)***	-	***717 (0.83)***	-	-	***1490 (0.54)***	-	***785 (0.40)***	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	ND (0.070) (0.0081)	-	-	ND (0.20) (0.062)	-	ND (0.20) (0.089)	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																											
ARSENIC	µg/L	10	-	-	6.4 (0.95)	-	2.3 (0.95)	-	ND (2.0) (0.95)	-	-	ND (2.0) (0.40)	-	ND (4.0) (1.9)	-	2.1 J (0.97)	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	ND (5.0) (2.3)	-	ND (5.0) (0.62)	-	ND (5.0) (0.62)	-	-	ND (5.0) (0.66)	-	0.40 J (0.40)	-	*ND (50)* (0.59)	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	ND (200) (52.2)	-	ND (200) (14.1)	-	ND (200) (14.1)	-	-	1660 (33.3)	-	25.1 J (11)	-	1150 (24)	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	ND (0.050) (0.050)	-	ND (1.0) (0.052)	-	ND (1.0) (0.080)	-	ND (1.0) (0.080)	-	-	ND (1.0) (0.034)	-	ND (5.0) (2.1)	-	***6.0 (1.7)***	ND (1.0) (0.090)	ND (1.0) (0.090)	-	-	-	-	ND (3.0) (3.0)	0.50 J (0.13)	0.78 J (0.09)	-	-
MANGANESE	µg/L	300	-	-	ND (5.0) (0.84)	-	ND (5.0) (0.44)	-	***778 (0.44)***	-	-	***660 (0.83)***	-	***1360 (0.54)***	-	***711 (0.40)***	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	ND (0.20) (0.0081)	-	ND (0.20) (0.062)	-	ND (0.20) (0.089)	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																											
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	239000 (460)	-	222000 (460)	-	-	-	354000 (700)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	45200 (460)	-	157000 (460)	-	ND (700) (700)	-	ND (700) (700)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	149000 (460)	-	ND (460) (460)	-	346000 (700)	-	354000 (700)	-	-	430000 (5000)	-	382000 (5000)	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	346000 (700)	-	-	-	-	430000 (5000)	-	383000 (3500)	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	79200 (200)	-	82900 (200)	-	59800 (200)	-	95500 (200)	-	-	74700 (1000)	-	136000 (48)	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	ND (500) (80)	-	ND (400) (80)	-	1600 (80)	-	1200 (80)	-	-	1400 (100)	-	740 (5.1)	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	26400 (200)	-	18600 (200)	-	7500 (200)	-	12800 (200)	-	-	16000 (1000)	-	16200 (1200)	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	ND (500) (50)	-	ND (250) (50)	-	ND (250) (50)	-	ND (250) (50)	-	-	270 (110)	-	30 B (5.6)	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	270 (100)	-	30 B (4.6)	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	ND (500) (80)	-	ND (400) (80)	-	ND (400) (80)	-	ND (400) (80)	-	-	ND (10) (10.0)	-	ND (10) (1)	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	7200 (300)	-	18600 (300)	-	3700 J (300)	-	16800 (300)	-	-	13900 (5000)	-	11200 (380)	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	560 (54)	-	1100 (54)	-	620 (54)	-	-	1400 (54)	-	ND (2000) (2000)	-	410 B (280)	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	8500 (1000)	-	2900 (240)	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	312000 (9700)	-	402000 (9700)	-	465000 (9700)	-	530000 (9700)	-	-	506000 (10000)	-	544000 (1800)	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	23400 (500)	-	37000 (500)	-	4300 (500)	-	5500 (500)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			URS-1				URS-2			URS-3					URS-4			URS-5							WP9-1	WP16-5	
Sample Date			9-Jan-13	9-Jan-13	9-May-16	23-Aug-16	6-Jun-06	9-Jan-13	9-Jan-13	25-May-05	6-Jun-06	9-May-16	24-Aug-16	24-Aug-16	6-Jun-06	9-Jan-13	9-Jan-13	9-May-16	24-Aug-16	6-Jun-06	10-May-16	24-Aug-16	24-Aug-16	25-May-05	26-May-05	9-Jun-06
Sample ID			URS-1_010913	URS-1_010913	GW-11109613-URS1-05-09-16-MM-028	GW-11109613-URS-1-082316-AC-013	URS2-060606	URS2_010913	URS2_010913	B134U-052505	URS3-060606	GW-11109613-URS3-05-09-16-MM-030	GW-11109613-URS-3-082416-KC-024	GW-11109613-URS-3-082416-KC-025	URS4-060606	URS-4_010913	URS-4_010913	GW-11109613-URS4-05-09-16-MM-026	GW-11109613-URS-4-082416-AC-017	URS5-060606	GW-11109613-URS5-05-10-16-MM-040	GW-11109613-URS-5-082416-AC-020	GW-11109613-URS-5-082416-KC-021	WP9-1-052505	WP16-5-052605	WP16-5-060906
Sampling Company			UNKNOWN	UNKNOWN	GHD	GHD	--	UNKNOWN	UNKNOWN	--	--	GHD	GHD	GHD	--	UNKNOWN	UNKNOWN	GHD	GHD	--	GHD	GHD	GHD	--	--	--
Laboratory			ACCUTEST	ACCUTEST	LL	LL	--	ACCUTEST	ACCUTEST	--	--	LL	LL	LL	--	ACCUTEST	ACCUTEST	LL	LL	--	LL	LL	LL	--	--	--
Laboratory Work Order			JB26465	JB26465	1659064	1699628	UNKNOWN	JB26467	JB26467	UNKNOWN	UNKNOWN	1659064	1700681	1700681	UNKNOWN	JB26465	JB26465	1659064	1700681	UNKNOWN	1660120	1700681	1700681	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	JB26465-1	JB26465-1F	8373133	8548690	4788102	JB26467-5	JB26467-5F	4532842	4788100	8373135	8553516	8553517	4788109	JB26465-2	JB26465-2F	8373131	8553509	4788112	8378036	8553512	8553513	4532841	4533805	4790637
Field Parameters																											
CONDUCTIVITY	mS/cm	n/v	-	-	0.352	0.44	-	-	-	-	-	0.72	-	0.68	-	-	-	0.34	0.41	-	1.24	-	0.94	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	7.7	0.12	-	-	-	-	-	0.75	-	33.82	-	-	-	2.45	2.79	-	1.29	-	3.22	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-101	-135	-	-	-	-	-	-146	-	-154	-	-	-	-96	-142	-	-319	-	-319	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	6.89	7.17	-	-	-	-	-	6.46	-	6.79	-	-	-	6.64	6.99	-	7.77	-	7.59	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	13.9	21.9	-	-	-	-	-	14.5	-	22.6	-	-	-	18.98	24.11	-	14.23	-	22.44	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	0	0	-	-	-	-	-	3.3	-	67.4	-	-	-	760	264	-	70	-	413	-	-	-
Volatile Organic Compounds																											
BENZENE	µg/L	5	***13.0 (1.0)***	-	ND (1) (0.5)	ND (1) (0.5)	***8 (0.5)***	3.4 (1.0)	-	***12 (0.5)***	***18 (0.5)***	4 (0.5)	2 (0.5)	1 (0.5)	ND (5) (0.5)	***46.8 (1.0)***	-	ND (1) (0.5)	ND (1) (0.5)	***5900 (25)***	***4000 (13)***	***2300 (0.5)***	***4900 (0.5)***	***1700 (10)***	ND (5) (0.5)	ND (5) (0.5)
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (1.0) (1.0)	-	ND (5) (1)	ND (5) (1)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (1)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	***140 (5)***	*ND (25)* (13)	*ND (10)* (0.5)	*ND (20)* (0.5)	*ND (100)* (20)	ND (5) (1)	ND (5) (1)
ETHYLBENZENE	µg/L	700	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	3.8 (1.0)	-	ND (5) (0.8)	ND (5) (0.8)	0.6 J (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.8)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	600 (4)	560 (13)	280 (0.5)	530 (0.5)	ND (100) (16)	ND (5) (0.8)	ND (5) (0.8)
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	11 (1)	7.7 (2.0)	-	5 (1)	18 (1)	55 (0.5)	2 J (0.5)	17 (0.5)	ND (5) (1)	2.8 (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	37 (5)	22 J (13)	13 J (0.5)	31 J (0.5)	ND (100) (20)	ND (5) (1)	ND (5) (1)
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-	ND (5) (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	4.7 (1.0)	-	2 (0.5)	2 (0.5)	*ND (25)* (3)	*ND (25)* (13)	ND (10) (0.5)	ND (20) (0.5)	*ND (100)* (10)	ND (5) (0.5)	ND (5) (0.5)
TOLUENE	µg/L	1000	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.7)	2.3 (1.0)	-	ND (5) (0.7)	ND (5) (0.7)	2 (0.5)	0.9 J (0.5)	1 (0.5)	ND (5) (0.7)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	***4900 (35)***	***8600 (130)***	***1500 (0.5)***	***6500 (0.5)***	ND (100) (14)	ND (5) (0.7)	ND (5) (0.7)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	-	6.2 (2.0)	-	-	-	ND (2) (0.5)	ND (2) (0.5)	0.5 J (0.5)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	-	***190 (13)***	***92 (0.5)***	***230 (0.5)***	-	-	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	-	2.2 (2.0)	-	-	-	0.8 J (0.5)	0.7 J (0.5)	0.8 J (0.5)	-	ND (2.0) (2.0)	-	ND (2) (0.5)	ND (2) (0.5)	-	56 (13)	27 (0.5)	72 (0.5)	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	7 (0.8)	19.9 (1.0)	-	9 (0.8)	9 (0.8)	9 (0.5)	8 (0.5)	7 (0.5)	ND (5) (0.8)	ND (1.0) (1.0)	-	ND (1) (0.5)	ND (1) (0.5)	2900 (40)	3000 (13)	1500 (0.5)	2800 (0.5)	ND (100) (16)	ND (5) (0.8)	ND (5) (0.8)
Volatile Organic Compounds (SW8011)																											
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.020) (0.020)	-	ND (0.029) (0.0098)	ND (0.029) (0.010)	ND (0.029) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0098)	ND (0.028) (0.0094)	0.011 J (0.0096)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.0095)	ND (0.020) (0.020)	-	ND (0.029) (0.0098)	ND (0.028) (0.010)	ND (0.029) (0.0096)	ND (0.029) (0.0097)	***0.089 (0.010)***	ND (0.040) (0.010)	ND (0.028) (0.0094)	ND (0.03) (0.011)	ND (0.029) (0.0098)
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																											
ANTHRACENE	µg/L	66	ND (0.10) (0.10)	-	0.33 (0.010)	0.62 (0.010)	-	1.23 (0.10)	-	-	-	21 (0.10)	0.17 (0.010)	9.6 (0.010)	-	ND (0.10) (0.10)	-	0.052 (0.010)	0.027 J (0.010)	-	5.6 (0.10)	3.3 (0.010)	4.8 (0.010)	-	-	-
BENZO(A)ANTHRACENE	µg/L	4.9	ND (0.10) (0.10)	-	0.038 J (0.010)	0.017 J (0.010)	-	0.787 (0.10)	-	-	-	***66 (0.10)***	***5.3 (0.010)***	***17 (0.010)***	-	ND (0.10) (0.10)	-	0.012 J (0.010)	ND (0.050) (0.010)	-	0.96 (0.10)	0.23 (0.010)	0.46 J (0.010)	-	-	-
BENZO(A)PYRENE	µg/L	0.2	ND (0.10) (0.10)	-	0.028 J (0.010)	0.053 UJ (0.010)	-	***0.407 (0.10)***	-	-	-	***47 (0.10)***	***4.5 (0.010)***	***12 (0.010)***	-	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)	-	***0.27 J (0.10)***	0.058 (0.010)	0.15 J (0.010)	-	-	-
BENZO(B)FLUORANTHENE	µg/L	1.2	ND (0.10) (0.10)	-	0.034 J (0.010)	0.053 UJ (0.010)	-	0.333 (0.10)	-	-	-	***56 (0.10)***	***5.4 (0.010)***	***14 (0.010)***	-	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)	-	0.24 J (0.10)	0.056 (0.010)	0.14 J (0.010)	-	-	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	ND (0.10) (0.10)	-	0.012 J (0.010)	0.053 UJ (0.010)	-	***0.314 (0.10)***	-	-	-	***14 (0.10)***	***1.4 (0.010)***	***3.2 (0.010)***	-	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)	-	*ND (0.51)* (0.10)	0.017 J (0.010)	*ND (0.51)* (0.010)	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	ND (0.10) (0.10)	-	0.035 J (0.010)	0.012 J (0.010)	*ND (5)* (1)	0.805 (0.10)	-	*ND (10)* (1)	***45 (1)***	***46 (0.10)***	***3.9 (0.010)***	***12 (0.010)***	*ND (5)* (1)	ND (0.10) (0.10)	-	ND (0.050) (0.010)	ND (0.050) (0.010)	*ND (5)* (1)	0.53 (0.10)	0.11 (0.010)	0.25 J (0.010)	*ND (10)* (1)	*ND (10)* (1)	*ND (5)* (1)
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	µg/L	1900	1.37 (0.10)	-	5.2 (0.010)	16 (0.010)	ND (5) (1)	1.61 (0.10)	-	29 (1)	98 (1)	27 (0.10)	4.9 (0.010)	28 (0.010)	ND (5) (1)	0.144 (0.10)	-	0.019 J (0.010)	0.022 J (0.010)	17 (1)	14 (0.10)	1.5 (0.010)	14 (0.010)	ND (10) (1)	ND (10) (1)	ND (5) (1)
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	1.74 (0.10)	-	0.29 (0.030)	4.4 (0.030)	ND (5) (1)	1.24 (0.10)	-	ND (10) (1)	ND (5) (1)	3.2 (0.31)	ND (0.065) (0.030)	ND (0.061) (0.030)	ND (5) (1)	0.268 (0.10)	-	ND (0.060) (0.030)	ND (0.060) (0.030)	***270 (5)***	***260 (3.0)***	***150 (0.030)***	***220 (0.030)***	ND (10) (1)	ND (10) (1)	ND (5) (1)
PHENANTHRENE	µg/L	1100	0.127 (0.10)	-	0.73 (0.030)	0.98 (0.030)	6 (1)	1.99 (0.10)	-	21 (1)	260 (5)	55 (0.31)	2.5 (0.030)	40 (0.030)	ND (5) (1)	0.113 (0.10)	-	0.055 J (0.030)	ND (0.060) (0.030)	25 (1)	20 (0.30)	12 (0.030)	21 (0.030)	14 (1)	ND (10) (1)	ND (5) (1)
PYRENE	µg/L	130	0.218 (0.10)	-	0.18 (0.010)	0.32 (0.010)	ND (5) (1)	2.09 (0.10)	-	15 (1)	***160 (5)***	130 (0.51)	8.4 (0.010)	31 (0.010)	ND (5) (1)	0.443 (0.10)	-	0.074 (0.010)	0.067 (0.010)	ND (5) (1)	3.5 (0.10)	1.7 (0.010)	2.8 (0.010)	22 (1)	ND (10) (1)	ND (5) (1)
Metals																											
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	-	ND (1) (0.047)	-	-	ND (1) (0.18)	ND (1) (0.047)	-	-	-	ND (1) (0.047)	-	-	-	-	ND (1) (0.047)	-	-	-	ND (1) (0.18)	1.5 (0.18)	ND (1) (0.047)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																											
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	ND (3.0) (3.0)	ND (1.0) (0.13)	0.22 J (0.09)	-	-	3.5 (3.0)	-	-	1.3 (0.13)	-	2.1 (0.090)	-	-	ND (3.0) (3.0)	ND (1.0) (0.13)	ND (1.0) (0.090)	-	ND (1.0) (0.13)	ND (1.0) (0.090)	0.14 J (0.090)	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																											
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			WPM-8		WPM-11			
Sample Date			26-May-05	9-Jun-06	26-May-05	9-Jun-06	9-Jan-13	9-Jan-13
Sample ID			WPM8-052605	WPM8-060906	WPM11-052605	WPM11-060906	WPM-11_010913	WPM-11_010913
Sampling Company			--	--	--	--	UNKNOWN	UNKNOWN
Laboratory			--	--	--	--	ACCUTEST	ACCUTEST
Laboratory Work Order			UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	J826465	J826465
Laboratory Sample ID	Units	MSC-PA	4533803	4790633	4533804	4790634	J826465-3	J826465-3F
Field Parameters								
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	-
Volatile Organic Compounds								
BENZENE	µg/L	5	***27 (0.5)***	ND (5) (0.5)	ND (5) (0.5)	ND (5) (0.5)	***20.5 (1.0)***	-
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (5) (1)	ND (5) (1)	ND (5) (1)	ND (5) (1)	ND (1.0) (1.0)	-
ETHYLBENZENE	µg/L	700	ND (5) (0.8)	ND (5) (0.8)	ND (5) (0.8)	ND (5) (0.8)	ND (1.0) (1.0)	-
2-HEXANONE	µg/L	n/v	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	27 (1)	40 (1)	ND (5) (1)	ND (5) (1)	ND (2.0) (2.0)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	***24 (0.5)***	***23 (0.5)***	ND (5) (0.5)	ND (5) (0.5)	ND (1.0) (1.0)	-
TOLUENE	µg/L	1000	ND (5) (0.7)	ND (5) (0.7)	ND (5) (0.7)	ND (5) (0.7)	ND (1.0) (1.0)	-
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	-	-	-	ND (2.0) (2.0)	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	-	-	-	ND (2.0) (2.0)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (5) (0.8)	ND (5) (0.8)	ND (5) (0.8)	ND (5) (0.8)	2.2 (1.0)	-
Volatile Organic Compounds (SW8011)								
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.0097)	ND (0.029) (0.0097)	*ND (0.29)* (0.097)	ND (0.029) (0.0096)	ND (0.020) (0.020)	-
1,2-DIBROMO-3-CHLOROPROPANE	µg/L	0.2	-	-	-	-	-	-
Semi-Volatile Organic Compounds								
ANTHRACENE	µg/L	66	-	-	-	-	24.8 (0.50)	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	-	-	-	***96.0 (5.0)***	-
BENZO(A)PYRENE	µg/L	0.2	-	-	-	-	***115 (5.0)***	-
BENZO(B)FLUORANTHENE	µg/L	1.2	-	-	-	-	***161 (5.0)***	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	-	-	-	***118 (5.0)***	-
BIS(2-ETHYLHEXYL) PHTHALATE	µg/L	6	-	-	-	-	-	-
CHRYSENE	µg/L	1.9	***2 (1)***	*ND (5)* (1)	***300 (5)***	***28 (1)***	***149 (5.0)***	-
DIBENZ(A,H)ANTHRACENE	µg/L	0.6	-	-	-	-	-	-
FLUORENE	µg/L	1900	6 (1)	ND (5) (1)	36 (5)	6 (1)	18.0 (0.50)	-
INDENO(1,2,3-C,D)PYRENE	µg/L	2.8	-	-	-	-	-	-
NAPHTHALENE	µg/L	100	ND (1) (1)	ND (5) (1)	ND (5) (5)	ND (5) (1)	1.86 (0.50)	-
PHENANTHRENE	µg/L	1100	2 (1)	ND (5) (1)	200 (5)	14 (1)	96.5 (5.0)	-
PYRENE	µg/L	130	9 (1)	ND (5) (1)	***400 (5)***	50 (1)	***265 (5.0)***	-
Metals								
ARSENIC	µg/L	10	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-
LEAD	µg/L	5	ND (1) (0.18)	ND (1) (0.047)	ND (1) (0.18)	ND (1) (0.047)	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-
Metals, Dissolved								
ARSENIC	µg/L	10	-	-	-	-	-	-
BARIUM	µg/L	2000	-	-	-	-	-	-
CHROMIUM	µg/L	100	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	-	-	ND (3.0) (3.0)
MANGANESE	µg/L	300	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-
SELENIUM	µg/L	50	-	-	-	-	-	-
General Chemistry								
ALKALINITY TO pH 4.5	ugcaco3/L	n/v	-	-	-	-	-	-
ALKALINITY TO pH 8.3	ugcaco3/L	n/v	-	-	-	-	-	-
ALKALINITY, BICARBONATE (AS CACO3)	µg/L	n/v	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CACO3)	µg/L	n/v	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	-	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	µmhos/cm	n/v	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	µg/L	n/v	-	-	-	-	-	-

Table K.1

Historical Groundwater Analytical Results Summary - AOI 6
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Groundwater - Used Aquifer, Non Residential, TDS ≤ 2500
6.5	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
ND (2.4) (1.2)	Analyte was not detected at a concentration greater than the laboratory reporting limit. The first value in parenthesis is the reporting limit. The method detection limit is shown in the second set of parenthesis.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
--	Laboratory and Sampling Company data not available.
NM	Not measured.
B	Indicates the analyte is detected in the associated blank as well as in the sample.
J	Indicates an estimated value.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
µg/L	Micrograms per liter.
mg/L	Milligrams per liter.
mV	Millivolts.
S.U.	Standard Units.
mS/cm	Microsiemens per centimeter.
deg c	Degrees Celcius.
g/L	Grams per liter.
NTU	Nephelometric Turbidity Units.
LL	Eurofins Lancaster Laboratories Environmental

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-104	AOI6 BH-12-106	AOI6 BH-12-107	AOI6 BH-12-108	AOI6 BH-12-111		AOI6 BH-12-112	AOI6 BH-12-114	AOI6 BH-12-115	AOI6 BH-12-119
Sample Date				4-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	4-Dec-12
Sample ID				BH-12-104_0.5-1'	BH-12-106_1-1.5'	BH-12-107_1-1.5'	BH-12-108_1'	BH-12-111_0.5-1'	BH-12-111_1-1.5'	BH-12-112_0.5-1'	BH-12-114_1-1.5'	BH-12-115_1-2'	BH-12-119_0.5-1'
Sample Depth				0.5 - 1 ft	1 - 1.5 ft	1 - 1.5 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	0.5 - 1 ft	1 - 1.5 ft	1 - 2 ft	0.5 - 1 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22962	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22962
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-14	JB22822-8	JB22822-2	JB22822-6	JB22822-10	JB22822-11	JB22822-1	JB22822-15	JB22822-12	JB22962-11
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.063) (0.0075)	***88.2***[B] (0.076)	0.0124 (0.00011)	***23.6***[B] (0.030)	0.207 J (0.030)	0.404 (0.027)	0.0016 (0.00011)	ND (0.00094) (0.00011)	0.0013 (0.00011)	0.00056 J (0.00012)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.063)* (0.0080)	*ND (0.064)* (0.0081)	ND (0.00092) (0.00012)	*ND (0.25)* (0.032)	*ND (0.25)* (0.032)	*ND (0.23)* (0.029)	ND (0.00095) (0.00012)	ND (0.00094) (0.00012)	ND (0.00094) (0.00012)	ND (0.0010) (0.00013)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.063) (0.0085)	ND (0.064) (0.0086)	ND (0.00092) (0.00012)	ND (0.25) (0.034)	ND (0.25) (0.033)	ND (0.23) (0.031)	ND (0.00095) (0.00013)	ND (0.00094) (0.00013)	ND (0.00094) (0.00013)	ND (0.0010) (0.00014)
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.063) (0.017)	0.452 (0.017)	0.00039 J (0.00024)	57.1 (1.3)	0.0992 J (0.065)	0.116 J (0.061)	0.00044 J (0.00025)	ND (0.00094) (0.00025)	ND (0.00094) (0.00025)	ND (0.0010) (0.00027)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	0.0351 J (0.0047)	31.2 (0.048)	0.00026 J (0.000069)	25.2 (0.019)	0.295 J (0.018)	0.200 J (0.017)	ND (0.0048) (0.000071)	ND (0.0047) (0.000070)	ND (0.0047) (0.000070)	0.00026 J (0.000076)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.063) (0.015)	ND (0.064) (0.015)	ND (0.00092) (0.00022)	ND (0.25) (0.059)	ND (0.25) (0.058)	ND (0.23) (0.054)	ND (0.00095) (0.00022)	ND (0.00094) (0.00022)	ND (0.00094) (0.00022)	ND (0.0010) (0.00024)
NAPHTHALENE	mg/kg	760[A]	25[B]	ND (0.32) (0.0077)	0.994 (0.0078)	ND (0.0046) (0.00011)	***25.9***[B] (0.031)	0.282 J (0.030)	0.285 J (0.028)	ND (0.0048) (0.00012)	ND (0.0047) (0.00011)	ND (0.0047) (0.00011)	ND (0.0051) (0.00012)
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	0.0154 J (0.0066)	5.34 (0.0067)	0.0017 (0.000097)	10.3 (0.026)	0.172 J (0.026)	0.217 J (0.024)	0.0022 (0.00010)	ND (0.00094) (0.000099)	0.00045 J (0.000099)	ND (0.0010) (0.00011)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.32) (0.013)	0.717 (0.013)	ND (0.0046) (0.00019)	***306***[B] (1.0)	0.301 J (0.052)	0.277 J (0.048)	ND (0.0048) (0.00020)	0.00055 J (0.00020)	ND (0.0047) (0.00020)	ND (0.0051) (0.00021)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.32) (0.010)	0.272 J (0.010)	ND (0.0046) (0.00015)	119 (0.80)	0.624 J (0.040)	0.0943 J (0.037)	ND (0.0048) (0.00015)	ND (0.0047) (0.00015)	ND (0.0047) (0.00015)	ND (0.0051) (0.00016)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.063) (0.0088)	1.14 (0.0089)	0.00094 (0.00013)	314 (0.70)	0.638 (0.034)	0.652 (0.032)	0.00062 J (0.00013)	0.00044 J (0.00013)	0.00052 J (0.00013)	0.00037 J (0.00014)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	ND (0.038) (0.013)	1.24 (0.060)	0.715 (0.024)	1.70 (0.011)	0.472 (0.061)	0.0920 J (0.057)	0.151 (0.012)	0.0343 J (0.012)	0.224 (0.013)	0.219 (0.026)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.0863 (0.012)	3.68 (0.056)	2.32 (0.022)	4.55 (0.21)	1.10 (0.057)	0.171 (0.053)	0.411 (0.011)	0.0569 (0.011)	0.499 (0.012)	0.266 (0.024)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.0630 (0.012)	4.06 (0.052)	2.61 (0.021)	4.83 (0.20)	1.43 (0.053)	0.142 J (0.050)	0.484 (0.010)	0.0748 (0.011)	0.783 (0.011)	0.320 (0.023)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.103 (0.013)	4.41 (0.057)	2.32 (0.023)	2.89 (0.011)	0.924 (0.058)	0.119 J (0.055)	0.626 (0.011)	0.0956 (0.012)	0.333 (0.012)	0.395 (0.025)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.0866 (0.014)	2.17 (0.064)	1.81 (0.026)	3.54 (0.24)	1.44 (0.065)	0.127 J (0.061)	0.335 (0.013)	0.100 (0.013)	0.766 (0.013)	0.587 (0.027)
CHRYSENE	mg/kg	760[A]	230[B]	0.0989 (0.013)	3.49 (0.058)	2.37 (0.023)	5.36 (0.22)	2.93 (0.059)	0.258 (0.055)	0.557 (0.012)	0.0876 (0.012)	1.03 (0.012)	0.295 (0.025)
FLUORENE	mg/kg	130000[A]	3800[B]	ND (0.038) (0.013)	1.02 (0.056)	0.439 (0.022)	15.2 (0.21)	1.23 (0.057)	0.641 (0.054)	0.206 (0.011)	0.0227 J (0.012)	0.0803 (0.012)	0.0540 J (0.024)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.0288 J (0.017)	5.80 (0.078)	3.02 (0.031)	14.9 (0.29)	1.74 (0.079)	0.680 (0.074)	0.510 (0.016)	0.0550 (0.016)	0.200 (0.016)	0.170 (0.034)
PYRENE	mg/kg	96000[A]	2200[B]	0.0825 (0.015)	6.80 (0.066)	5.05 (0.026)	7.95 (0.25)	3.64 (0.067)	0.588 (0.063)	0.718 (0.013)	0.103 (0.013)	1.57 (0.014)	0.301 (0.028)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	161 (0.14)	***897***[B] (0.13)	221 (0.12)	380 (0.13)	163 (0.13)	34.6 (0.11)	427 (0.26)	49.1 (0.24)	126 (0.28)	237 (0.14)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	82.3 ()	83.0 ()	87.3 ()	87.2 ()	89.4 ()	93.9 ()	83.5 ()	88.5 ()	81.9 ()	81.9 ()

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-120	AOI6 BH-12-122	AOI6 BH-12-123	AOI6 BH-12-129	AOI6 BH-12-130	AOI6 BH-12-131	AOI6 BH-12-135	AOI6 BH-12-136	AOI6 BH-12-137	AOI6 BH-12-138
Sample Date				4-Dec-12	3-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12
Sample ID				BH-12-120_0-1'	BH-12-122_1-1.5'	BH-12-123_1-1.5'	BH-12-129_1.5-2'	BH-12-130_1-2'	BH-12-131_1-2'	BH-12-135_1-1.5'	BH-12-136_1-1.5'	BH-12-137_0-1'	BH-12-138_0-1'
Sample Depth				0 - 1 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	0 - 1 ft	0 - 1 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22962	JB22822	JB22962	JB22962	JB22962	JB22962	JB23100	JB23100	JB23100	JB23100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-13	JB22822-18	JB22962-1	JB22962-6	JB22962-15	JB22962-16	JB23100-11	JB23100-9	JB23100-10	JB23100-6
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.0013) (0.00015)	0.0034 (0.00011)	ND (0.0010) (0.00012)	***91.6***[B] (0.57)	0.337 J (0.060)	0.110 (0.0068)	ND (0.00091) (0.00011)	ND (0.00084) (0.000099)	ND (0.00091) (0.00011)	ND (0.0015) (0.00018)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.0013) (0.00016)	ND (0.00088) (0.00011)	ND (0.0010) (0.00013)	*ND (0.048)* (0.0061)	*ND (0.50)* (0.064)	*ND (0.057)* (0.0072)	ND (0.00091) (0.00012)	ND (0.00084) (0.00011)	ND (0.00091) (0.00012)	ND (0.0015) (0.00019)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.0013) (0.00017)	ND (0.00088) (0.00012)	ND (0.0010) (0.00014)	ND (0.048) (0.0064)	ND (0.50) (0.068)	ND (0.057) (0.0077)	ND (0.00091) (0.00012)	ND (0.00084) (0.00011)	ND (0.00091) (0.00012)	ND (0.0015) (0.00020)
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.0013) (0.00033)	0.0021 (0.00023)	ND (0.0010) (0.00027)	0.837 (0.013)	ND (0.50) (0.13)	0.136 (0.015)	ND (0.00091) (0.00024)	ND (0.00084) (0.00022)	ND (0.00091) (0.00024)	ND (0.0015) (0.00039)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.0063) (0.000093)	0.0082 (0.000066)	0.00034 J (0.000077)	311 (0.35)	32.9 (0.037)	0.245 J (0.0042)	ND (0.0045) (0.000068)	ND (0.0042) (0.000062)	ND (0.0046) (0.000068)	ND (0.0074) (0.00011)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.0013) (0.00029)	ND (0.00088) (0.00021)	ND (0.0010) (0.00024)	ND (0.048) (0.011)	ND (0.50) (0.12)	ND (0.057) (0.013)	ND (0.00091) (0.00021)	ND (0.00084) (0.00020)	ND (0.00091) (0.00021)	ND (0.0015) (0.00035)
NAPHTHALENE	mg/kg	760[A]	25[B]	ND (0.0063) (0.00015)	0.0051 (0.00011)	ND (0.0052) (0.00013)	0.0543 J (0.0058)	ND (2.5) (0.061)	0.360 (0.0069)	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.0013) (0.00013)	0.0033 (0.000093)	ND (0.0010) (0.00011)	***116***[B] (0.50)	0.175 J (0.053)	0.211 (0.0060)	ND (0.00091) (0.000095)	ND (0.00084) (0.000088)	ND (0.00091) (0.000096)	ND (0.0015) (0.00016)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.0063) (0.00026)	0.0079 (0.00018)	ND (0.0052) (0.00022)	0.705 (0.010)	ND (2.5) (0.11)	0.0814 J (0.012)	ND (0.0045) (0.00019)	ND (0.0042) (0.00017)	ND (0.0046) (0.00019)	ND (0.0074) (0.00031)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.0063) (0.00020)	0.0049 (0.00014)	ND (0.0052) (0.00017)	0.257 (0.0076)	ND (2.5) (0.081)	0.0211 J (0.0091)	ND (0.0045) (0.00015)	ND (0.0042) (0.00013)	ND (0.0046) (0.00015)	ND (0.0074) (0.00024)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.0013) (0.00017)	0.0080 (0.00012)	ND (0.0010) (0.00014)	3.69 (0.0066)	ND (0.50) (0.070)	0.216 (0.0079)	ND (0.00091) (0.00013)	ND (0.00084) (0.00012)	ND (0.00091) (0.00013)	ND (0.0015) (0.00021)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	0.185 (0.015)	0.210 (0.011)	0.597 (0.014)	ND (0.033) (0.012)	3.58 (0.25)	0.0602 (0.012)	ND (0.037) (0.013)	0.0941 (0.012)	0.142 (0.013)	0.118 (0.014)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.127 (0.014)	0.589 (0.010)	1.79 (0.013)	0.0699 (0.011)	3.52 (0.012)	0.0983 (0.012)	0.0614 (0.012)	0.267 (0.011)	0.374 (0.012)	0.145 (0.013)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.118 (0.013)	0.816 (0.0097)	2.11 (0.012)	0.0627 (0.010)	6.52 (0.22)	0.116 (0.011)	0.0757 (0.011)	0.234 (0.011)	0.296 (0.011)	0.168 (0.013)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.198 (0.014)	0.874 (0.011)	2.15 (0.013)	0.0687 (0.011)	11.3 (0.24)	0.0976 (0.012)	0.0894 (0.012)	0.265 (0.012)	0.307 (0.012)	0.215 (0.014)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.555 (0.016)	0.915 (0.012)	1.59 (0.014)	0.0498 (0.012)	4.33 (0.27)	0.178 (0.013)	0.0597 (0.014)	0.122 (0.013)	0.141 (0.013)	0.169 (0.015)
CHRYSENE	mg/kg	760[A]	230[B]	0.236 (0.015)	0.730 (0.011)	1.87 (0.013)	0.0711 (0.011)	9.88 (0.25)	0.136 (0.012)	0.0655 (0.012)	0.237 (0.012)	0.332 (0.012)	0.148 (0.014)
FLUORENE	mg/kg	130000[A]	3800[B]	0.0220 J (0.014)	0.0605 (0.010)	0.307 (0.013)	ND (0.033) (0.011)	34.6 (0.24)	0.122 (0.012)	ND (0.037) (0.012)	0.0334 J (0.012)	0.0342 J (0.012)	ND (0.041) (0.014)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	ND (0.037) (0.010)	ND (0.035) (0.0096)	ND (0.036) (0.0098)	0.0191 J (0.011)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.243 (0.020)	0.456 (0.015)	1.49 (0.018)	0.0395 (0.015)	10.0 (0.33)	0.174 (0.016)	0.0353 J (0.017)	0.373 (0.016)	0.556 (0.016)	0.138 (0.019)
PYRENE	mg/kg	96000[A]	2200[B]	0.300 (0.017)	0.937 (0.012)	2.51 (0.015)	0.121 (0.013)	12.1 (0.28)	0.140 (0.014)	0.0708 (0.014)	0.415 (0.014)	0.594 (0.014)	0.202 (0.016)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	309 (0.15)	75.2 (0.12)	224 (0.14)	48.0 (0.12)	84.4 (0.13)	111 (0.13)	106 (0.12)	***853***[B] (0.25)	137 (0.28)	***483***[B] (0.13)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	73.8 ()	91.2 ()	84.4 ()	90.0 ()	87.0 ()	85.1 ()	87.3 ()	88.0 ()	85.5 ()	80.0 ()

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-139	AOI6 BH-12-140	AOI6 BH-12-144	AOI6 BH-12-146	AOI6 BH-12-147	AOI6 BH-12-148	AOI6 BH-12-149	AOI6-BH-16-001	AOI6-BH-16-002	AOI6-BH-16-003
Sample Date				5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	5-Dec-12	4-Dec-12	12-Apr-16	12-Apr-16	12-Apr-16
Sample ID				BH-12-139_1-1.5'	BH-12-140_0-0.5'	BH-12-144_0-0.5'	BH-12-146_0-1'	BH-12-147_1-1.5'	BH-12-148_0-1'	BH-12-149_1-1.5'	AOI6-BH-16-001-0-2-SOIL	AOI6-BH-16-002-0-2-SOIL	AOI6-BH-16-003-0-2-SOIL
Sample Depth				1 - 1.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 1 ft	1 - 1.5 ft	0 - 1 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory Work Order		A	B	JB23100	JB23100	JB23100	JB23100	JB23100	JB23100	JB22962	1651423	1651423	1651423
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB23100-8	JB23100-3	JB23100-5	JB23100-4	JB23100-2	JB23100-1	JB22962-4	8336826	8336823	8336825
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.00097) (0.00012)	ND (0.0012) (0.00014)	ND (0.00083) (0.000098)	ND (0.00098) (0.00012)	ND (0.00089) (0.00011)	ND (0.0011) (0.00013)	0.0506 J (0.0083)	0.002 J (0.0005)	0.001 J (0.0005)	ND (0.005) (0.0005)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.00097) (0.00012)	ND (0.0012) (0.00015)	ND (0.00083) (0.00010)	ND (0.00098) (0.00012)	ND (0.00089) (0.00011)	ND (0.0011) (0.00014)	*ND (0.070)* (0.0088)	*ND (0.006)* (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.00097) (0.00013)	ND (0.0012) (0.00016)	ND (0.00083) (0.00011)	ND (0.00098) (0.00013)	ND (0.00089) (0.00012)	ND (0.0011) (0.00014)	ND (0.070) (0.0094)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.00097) (0.00025)	ND (0.0012) (0.00031)	ND (0.00083) (0.00022)	ND (0.00098) (0.00026)	ND (0.00089) (0.00023)	ND (0.0011) (0.00028)	ND (0.070) (0.018)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.0048) (0.000072)	ND (0.0059) (0.000087)	ND (0.0041) (0.000061)	ND (0.0049) (0.000073)	ND (0.0044) (0.000066)	ND (0.0053) (0.000079)	0.147 J (0.0052)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.00097) (0.00023)	ND (0.0012) (0.00028)	ND (0.00083) (0.00019)	ND (0.00098) (0.00023)	ND (0.00089) (0.00021)	ND (0.0011) (0.00025)	ND (0.070) (0.016)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	ND (0.35) (0.0085)	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.00097) (0.00010)	ND (0.0012) (0.00012)	ND (0.00083) (0.000087)	ND (0.00098) (0.00010)	ND (0.00089) (0.000093)	ND (0.0011) (0.00011)	0.0223 J (0.0073)	0.003 J (0.001)	0.001 J (0.001)	ND (0.005) (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.0048) (0.00020)	ND (0.0059) (0.00025)	ND (0.0041) (0.00017)	ND (0.0049) (0.00020)	ND (0.0044) (0.00019)	ND (0.0053) (0.00022)	ND (0.35) (0.015)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.0048) (0.00015)	ND (0.0059) (0.00019)	ND (0.0041) (0.00013)	ND (0.0049) (0.00016)	ND (0.0044) (0.00014)	ND (0.0053) (0.00017)	ND (0.35) (0.011)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.00097) (0.00013)	ND (0.0012) (0.00016)	ND (0.00083) (0.00011)	ND (0.00098) (0.00014)	ND (0.00089) (0.00012)	ND (0.0011) (0.00015)	ND (0.070) (0.0097)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	0.0718 (0.013)	0.290 (0.012)	ND (0.033) (0.012)	0.0787 (0.013)	0.0166 J (0.012)	0.155 (0.014)	ND (0.037) (0.013)	0.730 (0.003)	0.340 (0.003)	0.410 (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.214 (0.012)	0.0701 (0.012)	0.0373 (0.011)	0.603 (0.012)	0.0519 (0.011)	0.328 (0.013)	0.0518 (0.012)	0.950 (0.003)	1.700 (0.003)	1.900 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.221 (0.011)	0.0915 (0.011)	0.0397 (0.010)	1.02 (0.012)	0.0650 (0.010)	0.327 (0.013)	0.0576 (0.011)	1.100 (0.003)	1.700 (0.003)	1.900 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.240 (0.012)	0.103 (0.012)	0.0560 (0.011)	1.36 (0.013)	0.0787 (0.011)	0.334 (0.014)	0.0670 (0.012)	1.500 (0.003)	2.200 (0.003)	2.600 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.144 (0.013)	0.0844 (0.013)	0.0289 J (0.012)	0.982 (0.014)	0.0542 (0.013)	0.205 (0.015)	0.0459 (0.014)	1.300 (0.003)	0.850 (0.003)	1.500 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	0.219 (0.012)	0.0825 (0.012)	0.0422 (0.011)	0.818 (0.013)	0.0608 (0.012)	0.307 (0.014)	0.0640 (0.013)	1.100 (0.003)	1.700 (0.003)	1.900 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	ND (0.036) (0.012)	ND (0.036) (0.012)	ND (0.033) (0.011)	0.0195 J (0.012)	ND (0.034) (0.011)	0.0308 J (0.014)	ND (0.037) (0.012)	0.320 (0.003)	0.079 J (0.003)	0.110 (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	0.0204 J (0.0098)	ND (0.036) (0.0097)	ND (0.033) (0.0090)	0.0158 J (0.010)	ND (0.034) (0.0093)	ND (0.041) (0.011)	-	6.900 (0.003)	0.630 (0.003)	0.510 (0.003)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.260 (0.016)	0.0474 (0.016)	0.0219 J (0.015)	0.329 (0.017)	0.0321 J (0.016)	0.425 (0.019)	0.0283 J (0.017)	2.000 (0.003)	0.870 (0.003)	1.700 (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	0.340 (0.014)	0.108 (0.014)	0.0613 (0.013)	1.36 (0.015)	0.0774 (0.013)	0.469 (0.016)	0.0804 (0.014)	1.600 (0.003)	2.000 (0.003)	2.800 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	***1120*** [B] (0.13)	***766*** [B] (0.44)	17.1 (0.12)	184 (0.13)	286 (0.13)	***745*** [B] (0.13)	27.9 (0.14)	288 (0.510)	180 (0.510)	***549*** [B] (0.510)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	14.6 (0.50)	24.8 (0.50)	12.2 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	84.8 ()	78.7 ()	91.8 ()	86.5 ()	90.9 ()	80.7 ()	81.3 ()	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-004			AOI6-BH-16-005	AOI6-BH-16-006		AOI6-BH-16-007	AOI6-BH-16-008	AOI6-BH-16-009	AOI6-BH-16-010
Sample Date				21-Apr-16	21-Apr-16	21-Apr-16	12-Apr-16	22-Apr-16	22-Apr-16	8-Apr-16	8-Apr-16	8-Apr-16	11-Apr-16
Sample ID				AOI6-BH16-DUP-SOIL-002	AOI6-BH-16-004-0-2-SOIL	AOI6-BH-16-004-2-4-SOIL	AOI6-BH-16-005-0-2-SOIL	AOI6-BH-16-006-0-2-SOIL	AOI6-BH-16-006-2-4-SOIL	AOI6-BH-16-007-0-2-SOIL	AOI6-BH-16-008-0-2-SOIL	AOI6-BH-16-009-0-2-SOIL	AOI6-BH-16-010-0-2-SOIL
Sample Depth					0.75 - 1.75 ft	1.75 - 2.3 ft	0 - 0.5 ft	1 - 1.5 ft	1.5 - 2.25 ft	1 - 2 ft	1 - 2 ft	1.5 - 1.75 ft	0.5 - 0.9 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1653975	1653975	1653975	1651423	1653975	1653975	1649742	1649742	1649742	1649742
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8349806	8349805	8349807	8336824	8349808	8349809	8329537	8329540	8329542	8329545
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	0.002 J (0.0005)	0.001 J (0.0005)	0.001 J (0.0005)	0.0004 J (0.0005)	ND (0.280) (0.028)	0.023 J (0.022)	0.003 J (0.0005)	0.001 J (0.0005)	0.005 J (0.0005)	0.011 (0.0005)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	*ND (0.280)* (0.055)	*ND (0.220)* (0.044)	*ND (0.006)* (0.001)	ND (0.005) (0.001)	*ND (0.006)* (0.001)	ND (0.005) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)
ETHYLBENZENE	mg/kg	890[A]	70[B]	0.001 J (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.280) (0.028)	ND (0.220) (0.022)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0005)	ND (0.005) (0.0005)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	0.003 J (0.001)	0.003 J (0.0009)	0.002 J (0.0009)	ND (0.004) (0.001)	0.088 J (0.055)	0.073 J (0.044)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	0.004 J (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	0.002 J (0.001)	0.0009 J (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.005) (0.001)	ND (0.005) (0.0009)	ND (0.005) (0.0009)	ND (0.004) (0.001)	ND (0.280) (0.055)	ND (0.220) (0.044)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	0.005 J (0.001)	0.004 J (0.0009)	0.001 J (0.0009)	ND (0.004) (0.001)	0.063 J (0.055)	0.065 J (0.044)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	0.600 (0.008)	0.430 (0.008)	0.550 (0.007)	0.016 J (0.003)	0.700 (0.008)	0.430 (0.007)	0.200 (0.003)	2.300 (0.003)	4.300 (0.003)	0.079 (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	1.700 (0.008)	1.100 (0.008)	1.600 (0.007)	0.110 (0.003)	1.200 (0.008)	0.750 (0.007)	0.720 (0.003)	5.500 (0.003)	5.200 (0.003)	0.210 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	1.500 (0.008)	1.100 (0.008)	1.500 (0.007)	0.130 (0.003)	1.200 (0.008)	0.740 (0.007)	0.670 (0.003)	4.800 (0.003)	3.300 (0.003)	0.260 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	1.900 (0.008)	1.300 (0.008)	1.700 (0.007)	0.180 (0.003)	1.300 (0.008)	1.000 (0.007)	0.950 (0.003)	6.300 (0.003)	4.000 (0.003)	0.410 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.940 (0.008)	0.700 (0.008)	0.840 (0.007)	0.150 (0.003)	0.760 (0.008)	0.520 (0.007)	0.510 (0.003)	3.300 (0.003)	1.900 (0.003)	0.230 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	1.700 (0.008)	1.100 (0.008)	1.500 (0.007)	0.120 (0.003)	1.300 (0.008)	0.820 (0.007)	0.850 (0.003)	5.600 (0.003)	5.100 (0.003)	0.280 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	0.190 (0.008)	0.160 (0.008)	0.200 (0.007)	0.005 J (0.003)	0.360 (0.008)	0.270 (0.007)	0.070 (0.003)	1.700 (0.003)	1.400 (0.003)	0.012 J (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	1.300 (0.008)	1.200 (0.008)	1.100 (0.007)	0.025 (0.003)	1.600 (0.008)	1.600 (0.007)	0.630 (0.003)	2.900 (0.003)	1.900 (0.003)	0.220 (0.003)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	1.700 (0.008)	1.100 (0.008)	1.200 (0.007)	0.053 (0.003)	1.500 (0.008)	1.100 (0.007)	0.720 (0.003)	10.000 (0.003)	14.000 (0.003)	0.230 (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	2.300 (0.008)	1.300 (0.008)	1.900 (0.007)	0.150 (0.003)	2.000 (0.008)	1.200 (0.007)	1.200 (0.003)	10.000 (0.003)	13.000 (0.003)	0.430 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	***529*** [B] (0.452)	399 (0.411)	189 (0.398)	68.7 (0.510)	142 (0.510)	225 (0.435)	***803*** [B] (0.510)	298 (0.510)	149 (0.510)	***1460*** [B] (0.510)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	12.5 (0.50)	13.2 (0.50)	11.0 (0.50)	4.9 (0.50)	14.5 (0.50)	11.8 (0.50)	14.7 (0.50)	13.6 (0.50)	11.5 (0.50)	19.7 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-011	AOI6-BH-16-012		AOI6-BH-16-013	AOI6-BH-16-014		AOI6-BH-16-015		AOI6-BH-16-016	
Sample Date				11-Apr-16	11-Apr-16	11-Apr-16	11-Apr-16	5-Apr-16	11-Jul-16	5-Apr-16	11-Jul-16	4-Apr-16	11-Jul-16
Sample ID				AOI6-BH-16-011-0-2-SOIL	AOI6-BH16-012-0-2-SOIL-R	AOI6-BH-16-012-0-2-SOIL	AOI6-BH-16-013-0-2-SOIL	AOI6-BH-16-014-0-2-SOIL	AOI6-BH-16-014-0-2-071116	AOI6-BH-16-015-0-2-SOIL	AOI6-BH-16-015-0-2-071116	AOI6-BH-16-016-0-2-SOIL	AOI6-BH-16-016-0-2-071116
Sample Depth				0.5 - 0.83 ft	0.5 - 1 ft	1 - 1.1 ft	0.5 - 1 ft	1 - 1.5 ft	1.25 - 1.83 ft	1.5 - 2 ft	1 - 1.41 ft	1 - 1.5 ft	1.5 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1649742	1649742	1649742	1649742	1647893	1682991	1647893	1682991	1647893	1682991
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8329546	8329549	8329548	8329550	8321192	8475490	8321190	8475488	8321184	8475486
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.270) (0.0005)	ND (0.250) (0.0005)	ND (0.230) (0.0005)	ND (0.230) (0.0005)	0.240 J (0.0005)	-	0.053 J (0.0005)	-	0.004 J (0.0005)	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.270)* (0.001)	*ND (0.250)* (0.001)	*ND (0.230)* (0.001)	*ND (0.230)* (0.001)	*ND (0.330)* (0.001)	-	*ND (0.330)* (0.001)	-	*ND (0.006)* (0.001)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	ND (0.330) (0.001)	-	ND (0.330) (0.001)	-	ND (0.006) (0.001)	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	0.095 J (0.001)	-	ND (0.330) (0.001)	-	ND (0.006) (0.001)	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.270) (0.001)	2.000 (0.001)	0.250 (0.001)	ND (0.230) (0.001)	ND (0.330) (0.001)	-	0.770 (0.001)	-	ND (0.006) (0.001)	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.270) (0.0005)	ND (0.250) (0.0005)	ND (0.230) (0.0005)	ND (0.230) (0.0005)	ND (0.330) (0.0005)	-	ND (0.330) (0.0005)	-	ND (0.006) (0.0005)	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	0.260 J (0.001)	-	0.130 J (0.001)	-	0.003 J (0.001)	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	0.110 J (0.001)	-	0.110 J (0.001)	-	ND (0.006) (0.001)	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.270) (0.001)	ND (0.250) (0.001)	ND (0.230) (0.001)	ND (0.230) (0.001)	ND (0.330) (0.001)	-	ND (0.330) (0.001)	-	ND (0.006) (0.001)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.270) (0.001)	0.061 J (0.001)	0.047 J (0.001)	ND (0.230) (0.001)	0.280 J (0.001)	-	0.470 (0.001)	-	ND (0.006) (0.001)	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	1.700 (0.003)	1.300 (0.003)	0.690 (0.003)	0.400 (0.003)	-	6.200 (0.003)	-	5.400 (0.003)	-	1.900 (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.990 (0.003)	0.940 (0.003)	1.900 (0.003)	0.460 (0.003)	-	7.800 (0.003)	-	2.000 J (0.003)	-	1.700 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.990 (0.003)	0.890 (0.003)	1.800 (0.003)	0.280 (0.003)	-	8.300 (0.003)	-	1.600 J (0.003)	-	1.700 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	1.300 (0.003)	1.600 (0.003)	2.300 (0.003)	0.340 (0.003)	-	8.200 (0.003)	-	2.900 (0.003)	-	2.300 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.690 (0.003)	0.740 (0.003)	1.400 (0.003)	0.210 (0.003)	-	6.300 (0.003)	-	2.200 (0.003)	-	1.600 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	1.000 (0.003)	2.700 (0.003)	1.800 (0.003)	1.600 (0.003)	-	8.900 (0.003)	-	5.800 (0.003)	-	2.000 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	8.500 (0.003)	66.000 (0.003)	0.330 (0.003)	2.500 (0.003)	-	9.300 (0.003)	-	7.400 (0.003)	-	5.100 (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	ND (0.220) (0.003)	1.300 (0.003)	0.440 (0.003)	ND (0.200) (0.003)	-	21.000 (0.003)	-	2.800 (0.003)	-	9.300 (0.003)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	10.000 (0.003)	20.000 (0.003)	2.000 (0.003)	0.960 (0.003)	-	24.000 (0.003)	-	16.000 (0.003)	-	9.600 (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	1.900 (0.003)	1.800 (0.003)	3.300 (0.003)	0.810 (0.003)	-	12.000 (0.003)	-	8.400 (0.003)	-	2.400 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	***734*** [B] (0.510)	141 (0.510)	194 (0.510)	32.0 (0.510)	344 (0.510)	-	***671*** [B] (0.510)	-	313 (0.510)	-
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	22.8 (0.50)	20.0 (0.50)	8.2 (0.50)	14.8 (0.50)	33.7 (0.50)	34.4 (0.50)	26.7 (0.50)	19.9 (0.50)	12.5 (0.50)	29.2 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-017	AOI6-BH-16-018	AOI6-BH-16-019			AOI6-BH-16-020	AOI6-BH-16-021	AOI6-BH-16-022	AOI6-BH-16-023	
Sample Date				11-Apr-16	11-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	21-Apr-16	6-Apr-16	21-Apr-16	22-Apr-16
Sample ID				AOI6-BH-16-017-0-2-SOIL	AOI6-BH-16-018-0-2-SOIL	AOI6-BH16-DUP-SOIL-001	AOI6-BH-16-019-0-2-SOIL	AOI6-BH-16-019-2-4-SOIL	AOI6-BH-16-020-0-2-SOIL	AOI6-BH-16-021-0-2-SOIL	AOI6-BH-16-022-0-2-SOIL	AOI6-BH-16-023-0-2-SOIL	AOI6-BH16-DUP-04-22-16-003
Sample Depth				0.5 - 1 ft	0.75 - 1 ft		0.8 - 1.8 ft	1.8 - 3 ft	0 - 1.1 ft	0 - 0.5 ft	0.5 - 1 ft	1.5 - 1.9 ft	
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1649742	1649742	1653975	1653975	1653975	1653975	1653975	1648963	1653975	1653975
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8329544	8329543	8349803	8349802	8349804	8349801	8349800	8325910	8349798	8349812
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	0.001 J (0.0005)	0.071 (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0006)	0.002 J (0.0006)	0.039 J (0.030)	0.062 J (0.024)	0.089 J (0.0005)	0.130 J (0.047)	***2.600*** [B] (0.021)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	*ND (0.006)* (0.001)	*ND (0.006)* (0.001)	*ND (0.300)* (0.061)	*ND (0.240)* (0.048)	*ND (0.240)* (0.001)	*ND (0.470)* (0.094)	*ND (0.210)* (0.043)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	ND (0.240) (0.048)	ND (0.240) (0.001)	ND (0.470) (0.094)	ND (0.210) (0.043)
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.004) (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	ND (0.240) (0.048)	0.052 J (0.001)	0.100 J (0.094)	0.110 J (0.043)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.004) (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	0.002 J (0.001)	0.420 (0.061)	ND (0.240) (0.048)	ND (0.240) (0.001)	0.340 J (0.094)	2.600 (0.043)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.004) (0.0005)	ND (0.004) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0006)	ND (0.006) (0.0006)	ND (0.300) (0.030)	ND (0.240) (0.024)	ND (0.240) (0.0005)	ND (0.470) (0.047)	ND (0.210) (0.021)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.004) (0.001)	0.005 (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	0.002 J (0.001)	ND (0.300) (0.061)	0.100 J (0.048)	0.150 J (0.001)	0.200 J (0.094)	0.750 (0.043)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.004) (0.001)	0.001 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	0.110 J (0.048)	ND (0.240) (0.001)	0.120 J (0.094)	0.096 J (0.043)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.300) (0.061)	0.082 J (0.048)	ND (0.240) (0.001)	ND (0.470) (0.094)	ND (0.210) (0.043)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.004) (0.001)	0.002 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.006) (0.001)	0.072 J (0.061)	0.100 J (0.048)	0.180 J (0.001)	0.210 J (0.094)	0.480 (0.043)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	0.350 (0.003)	0.670 (0.003)	1.400 (0.008)	1.400 (0.009)	0.390 (0.009)	3.700 (0.019)	1.000 (0.007)	2.100 (0.003)	2.100 (0.010)	4.900 (0.018)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	3.300 (0.003)	1.400 (0.003)	1.300 (0.008)	1.200 (0.009)	1.400 (0.009)	7.400 (0.019)	2.400 (0.007)	3.400 (0.003)	1.300 (0.010)	3.800 (0.018)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	4.200 (0.003)	1.900 (0.003)	1.400 (0.008)	1.300 (0.009)	1.400 (0.009)	7.800 (0.019)	2.200 (0.007)	4.100 (0.003)	1.700 (0.010)	2.700 (0.018)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	6.700 (0.003)	2.300 (0.003)	1.700 (0.008)	1.500 (0.009)	1.700 (0.009)	9.800 (0.019)	3.000 (0.007)	5.300 (0.003)	1.800 (0.010)	3.200 (0.018)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	4.800 (0.003)	1.500 (0.003)	1.500 (0.008)	1.400 (0.009)	0.880 (0.009)	5.100 (0.019)	1.400 (0.007)	3.300 (0.003)	1.800 (0.010)	1.000 (0.018)
CHRYSENE	mg/kg	760[A]	230[B]	4.900 (0.003)	1.900 (0.003)	1.400 (0.008)	1.300 (0.009)	1.400 (0.009)	7.700 (0.019)	2.300 (0.007)	4.900 (0.003)	1.500 (0.010)	3.200 (0.018)
FLUORENE	mg/kg	130000[A]	3800[B]	0.081 (0.003)	0.480 (0.003)	0.610 (0.008)	0.590 (0.009)	0.200 (0.009)	2.200 (0.019)	0.530 (0.007)	1.600 (0.003)	1.900 (0.010)	4.400 (0.018)
NAPHTHALENE	mg/kg	760[A]	25[B]	0.120 (0.003)	2.100 (0.003)	8.300 (0.008)	7.700 (0.009)	1.500 (0.009)	3.300 (0.019)	1.100 (0.007)	3.500 (0.003)	12.000 (0.010)	0.480 (0.018)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	2.400 (0.003)	1.600 (0.003)	3.200 (0.008)	3.300 (0.009)	1.100 (0.009)	13.000 (0.019)	3.200 (0.007)	5.400 (0.003)	4.800 (0.010)	14.000 (0.018)
PYRENE	mg/kg	96000[A]	2200[B]	8.100 (0.003)	2.400 (0.003)	1.600 (0.008)	1.600 (0.009)	1.400 (0.009)	13.000 (0.019)	3.900 (0.007)	7.900 (0.003)	2.400 (0.010)	6.600 (0.018)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	180 (0.510)	138 (0.510)	***6690*** [AB] (2.34)	***2920*** [AB] (2.34)	***1370*** [B] (2.81)	199 (0.503)	223 (2.43)	236 (0.510)	393 (0.593)	10.2 (0.480)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	9.4 (0.50)	8.6 (0.50)	20.3 (0.50)	22.8 (0.50)	24.9 (0.50)	12.6 (0.50)	9.6 (0.50)	12.5 (0.50)	34.9 (0.50)	9.1 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-025		AOI6-BH-16-026	AOI6-BH-16-027	AOI6-BH-16-028	AOI6-BH-16-029	AOI6-BH-16-030	AOI6-BH-16-031	AOI6-BH-16-032	AOI6-BH-16-033
Sample Date				22-Apr-16	22-Apr-16	22-Apr-16	13-Apr-16	13-Apr-16	13-Apr-16	14-Apr-16	14-Apr-16	13-Apr-16	13-Apr-16
Sample ID				AOI6-BH-16-025-0-2-SOIL	AOI6-BH-16-025-2-4-SOIL	AOI6-BH-16-026-0-2-SOIL	AOI6-BH-16-027-0-2-SOIL	AOI6-BH-16-028-0-2-SOIL	AOI6-BH-16-029-0-2-SOIL	AOI6-BH-16-030-0-2-SOIL	AOI6-BH-16-031-0-2-SOIL	AOI6-BH-16-032-0-2-SOIL	AOI6-BH-16-033-0-2-SOIL
Sample Depth				1.5 - 1.9 ft	1.9 - 2.2 ft	0.4 - 1.3 ft	1.75 - 2 ft	0.25 - 0.5 ft	1.75 - 2 ft	1.5 - 2 ft	1 - 2 ft	1 - 2 ft	1.5 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1653975	1653975	1653975	1651423	1651423	1651423	1651423	1651423	1651423	1651423
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8349810	8349811	8349813	8336830	8336829	8336827	8336847	8336849	8336838	8336836
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	***2.700*** [B] (0.022)	***1400.000 J*** [AB] (2.400)	***7.600*** [B] (0.022)	ND (0.005) (0.0005)	0.460 (0.0005)	***0.990*** [B] (0.0005)	***9.400*** [B] (0.0005)	***0.630*** [B] (0.0005)	0.120 J (0.0005)	0.003 J (0.0005)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.220)* (0.045)	*ND (24.000)* (4.800)	*ND (0.220)* (0.044)	ND (0.005) (0.001)	*ND (0.260)* (0.001)	*ND (0.250)* (0.001)	*ND (4.400)* (0.001)	*ND (0.220)* (0.001)	*ND (0.220)* (0.001)	ND (0.004) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.220) (0.045)	*ND (24.000)* (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	ND (0.260) (0.001)	ND (0.250) (0.001)	*ND (4.400)* (0.001)	ND (0.220) (0.001)	ND (0.220) (0.001)	ND (0.004) (0.001)
ETHYLBENZENE	mg/kg	890[A]	70[B]	0.120 J (0.045)	61.000 J (4.800)	0.082 J (0.044)	ND (0.005) (0.001)	0.100 J (0.001)	0.300 (0.001)	ND (4.400) (0.001)	0.053 J (0.001)	0.051 J (0.001)	ND (0.004) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	2.900 (0.045)	2200.000 J (48.000)	1.800 (0.044)	ND (0.005) (0.001)	0.220 J (0.001)	1.700 (0.001)	18.000 (0.001)	4.000 (0.001)	1.700 (0.001)	0.019 (0.001)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.220) (0.022)	*ND (24.000)* (2.400)	ND (0.220) (0.022)	ND (0.005) (0.0005)	ND (0.260) (0.0005)	ND (0.250) (0.0005)	*ND (4.400)* (0.0005)	ND (0.220) (0.0005)	ND (0.220) (0.0005)	ND (0.004) (0.0005)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	0.900 (0.045)	***640.000 J*** [B] (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	0.450 (0.001)	0.370 (0.001)	ND (4.400) (0.001)	ND (0.220) (0.001)	0.091 J (0.001)	ND (0.004) (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	0.095 J (0.045)	***50.000 J*** [B] (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	0.057 J (0.001)	0.250 J (0.001)	ND (4.400) (0.001)	ND (0.220) (0.001)	ND (0.220) (0.001)	ND (0.004) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	0.045 J (0.045)	18.000 J (4.800)	ND (0.220) (0.044)	ND (0.005) (0.001)	ND (0.260) (0.001)	0.095 J (0.001)	ND (4.400) (0.001)	ND (0.220) (0.001)	ND (0.220) (0.001)	ND (0.004) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	0.530 (0.045)	340.000 J (4.800)	0.092 J (0.044)	ND (0.005) (0.001)	0.340 (0.001)	0.600 (0.001)	ND (4.400) (0.001)	0.083 J (0.001)	0.130 J (0.001)	ND (0.004) (0.001)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	4.400 (0.018)	1.200 (0.004)	0.710 (0.015)	0.007 J (0.003)	0.390 (0.003)	2.900 (0.003)	0.037 J (0.003)	ND (0.019) (0.003)	0.008 J (0.003)	0.030 J (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	3.200 (0.018)	1.100 (0.004)	1.300 (0.015)	0.011 J (0.003)	0.910 (0.003)	6.100 (0.003)	0.094 J (0.003)	0.004 J (0.003)	0.032 (0.003)	0.120 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	2.300 (0.018)	0.690 (0.004)	1.300 (0.015)	0.010 J (0.003)	1.200 (0.003)	6.200 (0.003)	0.120 (0.003)	0.006 J (0.003)	0.036 (0.003)	0.130 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	2.800 (0.018)	1.000 (0.004)	0.890 (0.015)	0.016 J (0.003)	1.600 (0.003)	8.700 (0.003)	0.180 (0.003)	0.007 J (0.003)	0.049 (0.003)	0.180 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.930 (0.018)	0.330 (0.004)	0.720 (0.015)	0.009 J (0.003)	1.100 (0.003)	4.500 (0.003)	0.130 (0.003)	0.005 J (0.003)	0.032 (0.003)	0.130 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	2.800 (0.018)	0.970 (0.004)	2.200 (0.015)	0.021 J (0.003)	1.000 (0.003)	6.100 (0.003)	0.098 (0.003)	0.005 J (0.003)	0.038 (0.003)	0.140 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	4.200 (0.018)	0.850 (0.004)	0.510 (0.015)	0.009 J (0.003)	0.160 (0.003)	3.200 (0.003)	ND (0.095) (0.003)	ND (0.019) (0.003)	ND (0.018) (0.003)	ND (0.092) (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	0.460 (0.018)	2.000 (0.004)	1.100 (0.015)	0.010 J (0.003)	1.200 (0.003)	3.100 (0.003)	0.024 J (0.003)	ND (0.019) (0.003)	ND (0.018) (0.003)	ND (0.092) (0.003)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	13.000 (0.018)	4.100 (0.004)	1.900 (0.015)	0.02 J (0.003)	1.100 (0.003)	11.000 (0.003)	0.054 J (0.003)	0.004 J (0.003)	0.025 (0.003)	0.058 J (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	5.600 (0.018)	2.100 (0.004)	2.100 (0.015)	0.032 (0.003)	1.200 (0.003)	11.000 (0.003)	0.130 (0.003)	0.007 J (0.003)	0.057 (0.003)	0.190 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	10.3 (0.465)	64.3 (0.382)	61.8 (0.405)	20.0 (0.510)	159 (0.510)	138 (0.510)	66.0 (0.510)	5.63 (0.510)	10.3 (0.510)	12.8 (0.510)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	8.7 (0.50)	9.1 (0.50)	8.8 (0.50)	24.8 (0.50)	8.7 (0.50)	12.0 (0.50)	11.4 (0.50)	10.4 (0.50)	8.1 (0.50)	8.4 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-034	AOI6-BH-16-035	AOI6-BH-16-036	AOI6-BH-16-037		AOI6-BH-16-038	AOI6-BH-16-039	AOI6-BH-16-040		AOI6-BH
Sample Date				13-Apr-16	13-Apr-16	14-Apr-16	14-Apr-16	14-Apr-16	14-Apr-16	11-Apr-16	7-Apr-16	7-Apr-16	7-Apr-16
Sample ID				AOI6-BH-16-034-0-2-SOIL	AOI6-BH-16-035-0-2-SOIL	AOI6-BH-16-036-0-2-SOIL	AOI6-BH-16-037-0-2-SOIL	AOI6-BH-16-037-2-4-SOIL	AOI6-BH-16-038-0-2-SOIL	AOI6-BH-16-039-0-2-SOIL	AOI6-BH-16-040-0-2-SOIL	AOI6-BH-16-040-2-4-SOIL	AOI6-BH-16-041-0-2-SOIL
Sample Depth				1.5 - 1.75 ft	1.5 - 2 ft	1.25 - 1.75 ft	1 - 1.75 ft	1.75 - 2.25 ft	1.5 - 1.75 ft	0.5 - 0.6 ft	0.5 - 0.75 ft	1.75 - 2 ft	0.75 - 1.25 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1651423	1651423	1651423	1651423	1651423	1651423	1649742	1648963	1648963	1648963
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8336834	8336832	8336841	8336843	8336844	8336845	8329547	8325909	8325914	8325916
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	***44.000*** [B] (0.0005)	0.001 J (0.0005)	***0.550 J*** [B] (0.0005)	***710.000*** [AB] (0.0005)	***850.000*** [AB] (0.0005)	***8.800*** [B] (0.0005)	ND (0.005) (0.0005)	***1.100 J*** [B] (0.0005)	***1.400 J*** [B] (0.0005)	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (5.000)* (0.001)	ND (0.004) (0.001)	*ND (4.500)* (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	*ND (4.800)* (0.001)	ND (0.005) (0.001)	*ND (1.100)* (0.001)	*ND (4.900)* (0.001)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	*ND (5.000)* (0.001)	ND (0.004) (0.001)	*ND (4.500)* (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	*ND (4.800)* (0.001)	ND (0.005) (0.001)	*ND (1.100)* (0.001)	*ND (4.900)* (0.001)	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (5.000) (0.001)	ND (0.004) (0.001)	ND (4.500) (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.760 J (0.001)	13.000 (0.001)	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	230.000 (0.001)	0.021 (0.001)	59.000 (0.001)	***6500.000*** [B] (0.001)	***8500.000*** [B] (0.001)	14.000 (0.001)	ND (0.005) (0.001)	1.200 (0.001)	6.400 (0.001)	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	*ND (5.000)* (0.0005)	ND (0.004) (0.0005)	*ND (4.500)* (0.0005)	*ND (94.000)* (0.0005)	*ND (97.000)* (0.0005)	*ND (4.800)* (0.0005)	ND (0.005) (0.0005)	ND (1.100) (0.0005)	*ND (4.900)* (0.0005)	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	38.000 (0.001)	ND (0.004) (0.001)	ND (4.500) (0.001)	***840.000*** [B] (0.001)	***1200.000*** [B] (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	ND (1.100) (0.001)	ND (4.900) (0.001)	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (5.000) (0.001)	ND (0.004) (0.001)	ND (4.500) (0.001)	*ND (94.000)* (0.001)	*ND (97.000)* (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.330 J (0.001)	8.100 (0.001)	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (5.000) (0.001)	ND (0.004) (0.001)	ND (4.500) (0.001)	ND (94.000) (0.001)	ND (97.000) (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.380 J (0.001)	5.800 (0.001)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	2.100 J (0.001)	ND (0.004) (0.001)	ND (4.500) (0.001)	26.000 J (0.001)	27.000 J (0.001)	ND (4.800) (0.001)	ND (0.005) (0.001)	0.880 J (0.001)	2.700 J (0.001)	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	0.027 (0.003)	ND (0.019) (0.003)	0.064 J (0.003)	0.068 J (0.003)	0.110 (0.003)	0.073 J (0.003)	0.005 J (0.003)	1.700 (0.003)	5.900 (0.003)	6.200 (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.090 (0.003)	0.008 J (0.003)	0.350 (0.003)	0.110 (0.003)	0.050 (0.003)	0.190 (0.003)	0.019 J (0.003)	3.100 (0.003)	5.000 (0.003)	12.000 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.092 (0.003)	0.009 J (0.003)	0.300 (0.003)	0.160 (0.003)	0.074 (0.003)	0.220 (0.003)	0.019 J (0.003)	2.200 (0.003)	4.900 (0.003)	8.000 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.130 (0.003)	0.014 J (0.003)	0.570 (0.003)	0.240 (0.003)	0.110 (0.003)	0.330 (0.003)	0.033 (0.003)	3.200 (0.003)	6.300 (0.003)	14.000 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.083 (0.003)	0.010 J (0.003)	0.270 (0.003)	0.190 (0.003)	0.070 (0.003)	0.200 (0.003)	0.015 J (0.003)	1.200 (0.003)	3.100 (0.003)	5.100 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	0.110 (0.003)	0.010 J (0.003)	0.410 (0.003)	0.140 (0.003)	0.053 (0.003)	0.220 (0.003)	0.025 (0.003)	2.900 (0.003)	5.100 (0.003)	12.000 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	0.017 J (0.003)	ND (0.019) (0.003)	0.035 J (0.003)	0.049 J (0.003)	0.033 (0.003)	0.036 J (0.003)	ND (0.023) (0.003)	1.600 (0.003)	6.400 (0.003)	6.800 (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	0.070 (0.003)	ND (0.019) (0.003)	0.099 (0.003)	1.300 (0.003)	1.400 (0.003)	0.093 J (0.003)	0.006 J (0.003)	3.200 (0.003)	***36.000*** [B] (0.003)	22.000 (0.003)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.087 (0.003)	0.010 J (0.003)	0.260 (0.003)	0.180 (0.003)	3.200 (0.003)	0.180 (0.003)	0.016 J (0.003)	6.700 (0.003)	21.000 (0.003)	25.000 (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	0.160 (0.003)	0.015 J (0.003)	0.510 (0.003)	0.220 (0.003)	0.084 (0.003)	0.280 (0.003)	0.033 (0.003)	6.400 (0.003)	9.700 (0.003)	21.000 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	14.0 (0.510)	10.0 (0.510)	60.8 (0.510)	100 (0.510)	105 (0.510)	33.1 (0.510)	7.22 (0.510)	249 (0.510)	142 (0.510)	***3820*** [AB] (0.510)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	13.2 (0.50)	10.7 (0.50)	10.5 (0.50)	15.1 (0.50)	14.4 (0.50)	10.1 (0.50)	24.7 (0.50)	10.6 (0.50)	8.4 (0.50)	16.5 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	8.15 (0.0100)	8.09 (0.0100)	7.89 (0.0100)
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				I-16-041	AOI6-BH-16-043	AST-250-SS-1		AST-250-SS-2		AST-250-SS-3		AST-250-SS-4	
Sample Date				7-Apr-16	7-Apr-16	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07
Sample ID				AOI6-BH-16-041-2-4-SOIL	AOI6-BH-16-43-0-2-SOIL	AST-250-SS-1	AST-250-SS-1	AST-250-SS-2	AST-250-SS-2	AST-250-SS-3	AST-250-SS-3	AST-250-SS-4	AST-250-SS-4
Sample Depth				1.75 - 2.25 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP
Laboratory Work Order		A	B	1648963	1648963	073770	075326	073770	075326	073770	075326	073770	075326
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8325912	8325911	0705-2798	0707-0961	0705-2799	0707-0962	0705-2800	0707-0963	0705-2802	0707-0964
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	***4.300*** [B] (0.0005)	***0.810*** [B] (0.0005)	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (3.200)* (0.001)	*ND (0.220)* (0.001)	*ND (0.081) D* ()	-	*ND (0.097) D* ()	-	*ND (0.088) D* ()	-	*ND (0.100) D* ()	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	*ND (3.200)* (0.001)	ND (0.220) (0.001)	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	17.000 (0.001)	0.064 J (0.001)	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	6.400 (0.001)	0.055 J (0.001)	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	0.120 D ()	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	*ND (3.200)* (0.0005)	ND (0.220) (0.0005)	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	0.052 J D ()	-	0.067 J D ()	-	0.310 D ()	-	4.2 D ()	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	2.500 J (0.001)	0.190 J (0.001)	ND (0.081) D ()	-	ND (0.097) D ()	-	ND (0.088) D ()	-	ND (0.100) D ()	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	***47.000*** [B] (0.001)	0.045 J (0.001)	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	22.000 (0.001)	0.046 J (0.001)	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	39.000 (0.001)	0.330 (0.001)	ND (0.081) D ()	-	ND (0.097) D ()	-	0.098 D ()	-	0.870 D ()	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	2.700 (0.003)	0.260 (0.003)	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	5.800 (0.003)	0.710 (0.003)	-	-	-	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	5.300 (0.003)	1.100 (0.003)	-	-	-	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	7.800 (0.003)	1.500 (0.003)	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	3.900 (0.003)	1.300 (0.003)	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760[A]	230[B]	5.600 (0.003)	0.780 (0.003)	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000[A]	3800[B]	2.800 (0.003)	0.050 J (0.003)	ND (0.350) ()	ND (0.350) ()	ND (0.350) ()	ND (0.350) ()	ND (0.370) ()	ND (0.350) ()	ND (0.350) ()	0.620 ()
NAPHTHALENE	mg/kg	760[A]	25[B]	12.000 (0.003)	0.270 (0.003)	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	13.000 (0.003)	0.420 (0.003)	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000[A]	2200[B]	11.000 (0.003)	0.860 (0.003)	-	-	-	-	-	-	-	-
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	196 (0.510)	331 (0.510)	-	***940*** [B] ()	-	30 ()	-	100 ()	-	2.8 ()
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	17.9 (0.50)	8.0 (0.50)	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	7.86 (0.0100)	9.15 (0.0100)	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AST-250-SS-5		AST-250-SS-6		AST-250-SS-7		AST-250-SS-8		B-148	B-149
Sample Date				15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	15-May-07	17-Sep-02	17-Sep-02
Sample ID				AST-250-SS-5	AST-250-SS-5	AST-250-SS-6	AST-250-SS-6	AST-250-SS-7	AST-250-SS-7	AST-250-SS-8	AST-250-SS-8	MW-1(1-1.5)	MW-2(1-1.5)
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP	LL	LL
Laboratory Work Order		A	B	073770	075326	073770	075326	073770	075326	073770	075326	823334	823334
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-2801	0707-0965	0705-2803	0707-0966	0705-2804	0707-0967	0705-2805	0707-0968	3901264	3901265
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.110) D ()	-	ND (0.069) D ()	-	ND (0.078) D ()	-	ND (0.092) D ()	-	***2.6***[B] (0.001)	***6.5***[B] (0.001)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.110) D* ()	-	*ND (0.069) D* ()	-	*ND (0.078) D* ()	-	*ND (0.092) D* ()	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.110) D ()	-	ND (0.069) D ()	-	ND (0.078) D ()	-	ND (0.092) D ()	-	-	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.110) D ()	-	ND (0.069) D ()	-	ND (0.078) D ()	-	ND (0.092) D ()	-	3.7 (0.001)	0.520 (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.110) D ()	-	ND (0.069) D ()	-	ND (0.078) D ()	-	ND (0.092) D ()	-	60 (0.001)	190 (0.001)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	-	-	-	-	-	-	-	-	ND (0.310) (0.001)	ND (0.330) (0.001)
NAPHTHALENE	mg/kg	760[A]	25[B]	0.081 J D ()	-	0.065 J D ()	-	0.055 J D ()	-	0.075 J D ()	-	1.8 (0.001)	1.9 (0.001)
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.110) D ()	-	ND (0.069) D ()	-	ND (0.078) D ()	-	ND (0.092) D ()	-	1.6 (0.001)	ND (0.330) (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.110) D ()	-	ND (0.069) D ()	-	ND (0.078) D ()	-	ND (0.092) D ()	-	3.5 (0.001)	0.860 (0.001)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	-	-	-	-	-	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	-	-	-	-	-	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	-	-	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760[A]	230[B]	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000[A]	3800[B]	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()	ND (0.380) ()	ND (0.350) ()	ND (0.390) ()	ND (0.360) ()	ND (0.350) ()	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	-	190 ()	-	***1500***[B] ()	-	140 ()	-	13 ()	-	-
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	22.7 (0.50)	27.4 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B-150	B-151	B-152	B-153	B-154	B-155	B-156	B-157	B-160	B-161
Sample Date				16-Sep-02	1-Mar-06	1-Mar-06	1-Mar-06	1-Mar-06	20-Mar-06	20-Mar-06	1-Mar-06	1-Mar-06	1-Mar-06
Sample ID				MW-3(1-1.5)	BH-B151-030106-0.5-1	BH-B152-030106-1.5-2	BH-B153-030106-1.5-2	BH-B154-030106-1-1.5	BH-B155-032006-1.5-2	BH-B156-032006-1-1.5	BH-B157-030106-1-1.5	BH-B160-030106-1-1.5	BH-B161-030106-1.5-2
Sample Depth				1 - 1.5 ft	0.5 - 1 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	823334	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	SHS-PA	3901266	4720664	4720663	4720662	4720665	4734388	4734387	4720661	4720658	4720659
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	***610*** [AB] (0.001)	ND (0.200) (0.018)	0.460 (0.017)	ND (0.420) (0.025)	***3.6*** [B] (0.013)	ND (0.220) (0.016)	0.009 (0.0004)	ND (0.240) (0.019)	ND (0.005) (0.0004)	ND (0.440) (0.034)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	-	*ND (0.200)* (0.036)	*ND (0.200)* (0.033)	*ND (0.420)* (0.05)	*ND (0.160)* (0.027)	*ND (0.220)* (0.032)	ND (0.005) (0.0007)	*ND (0.240)* (0.038)	ND (0.005) (0.0007)	*ND (0.440)* (0.069)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	-	ND (0.200) (0.036)	ND (0.200) (0.033)	ND (0.420) (0.05)	ND (0.160) (0.027)	ND (0.220) (0.032)	ND (0.005) (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	ND (0.440) (0.069)
ETHYLBENZENE	mg/kg	890[A]	70[B]	14 (0.001)	ND (0.200) (0.036)	0.240 (0.033)	ND (0.420) (0.05)	1.8 (0.027)	ND (0.220) (0.032)	ND (0.005) (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	ND (0.440) (0.069)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	270 (0.001)	ND (0.200) (0.036)	20 (0.33)	ND (0.420) (0.05)	1.8 (0.027)	ND (0.220) (0.032)	0.007 (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	2.2 (0.069)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (1.1) (0.001)	ND (0.200) (0.018)	ND (0.200) (0.017)	ND (0.420) (0.025)	ND (0.160) (0.013)	ND (0.220) (0.016)	ND (0.005) (0.0004)	ND (0.240) (0.019)	ND (0.005) (0.0004)	ND (0.440) (0.034)
NAPHTHALENE	mg/kg	760[A]	25[B]	4.8 (0.001)	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	***300*** [B] (0.001)	ND (0.200) (0.036)	ND (0.200) (0.033)	ND (0.420) (0.05)	0.240 (0.027)	ND (0.220) (0.032)	0.006 (0.0007)	ND (0.240) (0.038)	ND (0.005) (0.0007)	ND (0.440) (0.069)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	67 (0.001)	ND (0.200) (0.036)	ND (0.200) (0.033)	ND (0.420) (0.05)	1.2 (0.027)	ND (0.220) (0.032)	0.007 (0.0007)	0.270 (0.038)	ND (0.005) (0.0007)	5.1 (0.069)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	-	ND (0.920) (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	6.2 (1)	0.750 (0.033)	0.860 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	0.360 (0.033)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	-	2.0 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	5.9 (1)	0.840 (0.033)	0.830 (0.033)	1.4 (0.17)	ND (0.220) (0.033)	1.8 (0.033)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	-	1.7 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	ND (5.8) (1)	0.780 (0.033)	0.820 (0.033)	1.5 (0.17)	ND (0.220) (0.033)	2.2 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	-	1.6 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	ND (5.8) (1)	1.1 (0.033)	1.1 (0.033)	2.1 (0.17)	ND (0.220) (0.033)	2.7 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	-	ND (0.920) (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	ND (5.8) (1)	0.310 (0.033)	0.420 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	1.3 (0.033)
CHRYSENE	mg/kg	760[A]	230[B]	-	2.4 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	7.8 (1)	0.820 (0.033)	0.920 (0.033)	1.4 (0.17)	ND (0.220) (0.033)	2.1 (0.033)
FLUORENE	mg/kg	130000[A]	3800[B]	-	1.1 (0.17)	ND (3.0) (0.5)	4.2 (0.033)	7.8 (1)	1.1 (0.033)	1.9 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	ND (0.210) (0.033)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	8.6 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	6.8 (1)	0.700 (0.033)	0.370 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	0.340 (0.033)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	-	2.9 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	31 (1)	3.0 (0.033)	4.3 (0.033)	ND (1.1) (0.17)	ND (0.220) (0.033)	0.410 (0.033)
PYRENE	mg/kg	96000[A]	2200[B]	-	5.3 (0.17)	ND (3.0) (0.5)	ND (0.280) (0.033)	15 (1)	2.3 (0.033)	2.5 (0.033)	1.4 (0.17)	ND (0.220) (0.033)	2.1 (0.033)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	-	198 (3.75)	27 (0.765)	66.3 (0.78)	410 (0.772)	***618*** [B] (0.765)	***1070*** [B] (0.78)	178 (0.78)	30.8 (0.765)	70.1 (0.757)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	14.2 (0.50)	9.4 (0.5)	15.6 (0.5)	40.8 (0.5)	13.5 (0.5)	27.3 (0.5)	22 (0.5)	21.7 (0.5)	22.9 (0.5)	21.6 (0.5)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B-162	B-164	B-166	B-167	B-170	B-171	B-172		B-173	
Sample Date				1-Mar-06	1-Mar-06	13-Dec-12	13-Dec-12	13-Dec-12	6-Apr-16	6-Apr-16	12-Jul-16	5-Apr-16	12-Jul-16
Sample ID				BH-B162-030106-1-1.5	BH-B164-030106-1.5-2	B-166_2'	B-167_2'	B-170_2'	AOI6-B-171-0-2-SOIL	AOI6-B-172-0-2-SOIL	AOI6-B-172-0-2-071216	AOI6-B-173-0-2-SOIL	AOI6-B-173-0-2-071216
Sample Depth				1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	1 - 1.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	UNKNOWN	UNKNOWN	JB23816	JB23816	JB23816	1648963	1647893	1682991	1647893	1682991
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4720657	4720660	JB23816-3	JB23816-1	JB23816-5	8325908	8321194	8475492	8321186	8475494
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.005) (0.0005)	ND (0.370) (0.03)	ND (0.0015) (0.00018)	0.0638 (0.0058)	ND (0.0010) (0.00012)	0.001 J (0.0005)	0.210 J (0.0005)	-	0.300 J (0.0005)	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.005) (0.001)	*ND (0.370)* (0.06)	ND (0.0015) (0.00019)	*ND (0.048)* (0.0061)	ND (0.0010) (0.00013)	ND (0.004) (0.001)	*ND (0.380)* (0.001)	-	*ND (0.310)* (0.001)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00020)	ND (0.048) (0.0065)	ND (0.0010) (0.00014)	ND (0.004) (0.001)	ND (0.380) (0.001)	-	ND (0.310) (0.001)	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00039)	0.395 (0.013)	ND (0.0010) (0.00027)	ND (0.004) (0.001)	0.100 J (0.001)	-	ND (0.310) (0.001)	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.005) (0.001)	2.2 (0.06)	ND (0.0074) (0.00011)	3.15 (0.0036)	0.0030 J (0.000077)	ND (0.004) (0.001)	ND (0.380) (0.001)	-	0.360 (0.001)	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.005) (0.0005)	ND (0.370) (0.03)	ND (0.0015) (0.00035)	ND (0.048) (0.011)	0.00054 J (0.00024)	ND (0.004) (0.0005)	ND (0.380) (0.0005)	-	ND (0.310) (0.0005)	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00016)	0.0932 (0.0051)	0.00040 J (0.00011)	ND (0.004) (0.001)	0.580 (0.001)	-	0.130 J (0.001)	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	ND (0.0074) (0.00031)	0.229 J (0.010)	ND (0.0052) (0.00022)	ND (0.004) (0.001)	0.110 J (0.001)	-	0.310 (0.001)	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	ND (0.0074) (0.00024)	0.101 J (0.0077)	ND (0.0052) (0.00017)	ND (0.004) (0.001)	ND (0.380) (0.001)	-	0.130 J (0.001)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.005) (0.001)	ND (0.370) (0.06)	ND (0.0015) (0.00021)	0.806 (0.0067)	ND (0.0010) (0.00014)	ND (0.004) (0.001)	0.510 (0.001)	-	0.660 (0.001)	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	ND (0.180) (0.033)	ND (0.200) (0.033)	0.0812 (0.015)	0.0325 J (0.012)	0.257 (0.013)	0.120 (0.003)	-	0.800 (0.003)	-	0.089 J (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.200 (0.033)	0.350 (0.033)	0.318 (0.014)	0.113 (0.011)	0.578 (0.012)	0.440 (0.003)	-	2.400 (0.003)	-	0.300 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.220 (0.033)	0.410 (0.033)	0.330 (0.013)	0.130 (0.010)	0.659 (0.011)	0.450 (0.003)	-	1.400 (0.003)	-	0.330 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.290 (0.033)	0.680 (0.033)	0.293 (0.014)	0.150 (0.011)	0.617 (0.012)	0.540 (0.003)	-	2.600 (0.003)	-	0.440 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	ND (0.180) (0.033)	0.270 (0.033)	0.228 (0.016)	0.121 (0.013)	0.466 (0.014)	0.290 (0.003)	-	0.950 (0.003)	-	0.390 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	0.250 (0.033)	0.360 (0.033)	0.334 (0.014)	0.137 (0.011)	0.589 (0.012)	0.420 (0.003)	-	2.300 (0.003)	-	0.420 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	ND (0.180) (0.033)	ND (0.200) (0.033)	0.0259 J (0.014)	0.0176 J (0.011)	0.229 (0.012)	0.044 J (0.003)	-	0.079 J (0.003)	-	0.049 J (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	ND (0.180) (0.033)	ND (0.200) (0.033)	0.0370 J (0.011)	0.0352 (0.0092)	0.114 (0.010)	0.230 (0.003)	-	1.200 (0.003)	-	0.270 (0.003)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	ND (0.180) (0.033)	0.400 (0.033)	0.285 (0.019)	0.108 (0.015)	0.379 (0.017)	0.220 (0.003)	-	0.930 (0.003)	-	0.340 (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	0.320 (0.033)	0.500 (0.033)	0.536 (0.016)	0.275 (0.013)	1.16 (0.014)	0.500 (0.003)	-	3.000 (0.003)	-	0.490 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	***584***[B] (0.757)	18.5 (0.772)	***744***[B] (0.15)	253 (0.12)	66.9 (0.13)	45.7 (0.510)	168 (0.510)	-	170 (0.510)	-
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	6.9 (0.5)	17.9 (0.5)	-	-	-	6.2 (0.50)	14.6 (0.50)	26.2 (0.50)	17.5 (0.50)	9.1 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	75.0 ()	88.8 ()	83.1 ()	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B-174		B-175		BH-02-06		BH-03-06		BH-13-06	BH-1
Sample Date				4-Apr-16	13-Jul-16	5-Apr-16	13-Jul-16	22-Mar-06	22-Mar-06	22-Mar-06	22-Mar-06	22-Mar-06	23-Mar-06
Sample ID				AOI6-B-174-0-2-SOIL	AOI6-B-174-0-2-071316	AOI6-B-175-0-2-SOIL	AOI6-B-175-0-2-071316	BH-02-06-032206-1.5-2	BH-02-06-032206-1.5-2	BH-03-06-032206-1.5-2	BH-03-06-032206-1.5-2	BH-13-06-032206-1-1.5	BH-14-06-032306-0.5-1
Sample Depth				1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	0.5 - 1 ft
Sampling Company				GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1647893	1682991	1647893	1682991	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8321182	8475496	8321188	8475498	4736395	4739181	4736394	4739180	4736396	4736397
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.004) (0.0005)	-	***1.100*** [B] (0.0005)	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.004) (0.001)	-	*ND (0.320)* (0.001)	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.004) (0.001)	-	ND (0.320) (0.001)	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.004) (0.001)	-	0.350 (0.001)	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.004) (0.001)	-	0.270 J (0.001)	-	-	-	-	-	-	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.004) (0.0005)	-	ND (0.320) (0.0005)	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.004) (0.001)	-	1.300 (0.001)	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.004) (0.001)	-	0.290 J (0.001)	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.004) (0.001)	-	0.260 J (0.001)	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.004) (0.001)	-	1.600 (0.001)	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	-	0.110 J (0.003)	-	2.400 (0.003)	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	-	0.600 (0.003)	-	1.900 (0.003)	-	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	-	0.540 (0.003)	-	1.400 (0.003)	-	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	-	0.710 (0.003)	-	1.900 (0.003)	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	-	0.390 (0.003)	-	1.700 (0.003)	-	-	-	-	-	-
CHRYSENE	mg/kg	760[A]	230[B]	-	0.630 (0.003)	-	2.000 (0.003)	-	-	-	-	-	-
FLUORENE	mg/kg	130000[A]	3800[B]	-	ND (0.210) (0.003)	-	3.600 (0.003)	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	0.180 J (0.003)	-	9.300 (0.003)	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	-	0.400 (0.003)	-	10.000 (0.003)	-	-	-	-	-	-
PYRENE	mg/kg	96000[A]	2200[B]	-	0.890 (0.003)	-	2.800 (0.003)	-	-	-	-	-	-
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	240 (8.4)	-	90.1 (8.4)	-	-
LEAD	mg/kg	2240[A]	450[B]	6.22 (0.510)	-	207 (0.510)	-	***1260*** [B] (0.75)	-	***1650*** [B] (0.757)	-	283 (0.757)	***1040*** [B] (0.75)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	4.8 (0.50)	21.2 (0.50)	30.1 (0.50)	40.2 (0.50)	43.5 (0.5)	-	33.5 (0.5)	-	38.3 (0.5)	33.1 (0.5)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				4-06	BH-20-06	BH-21-06	BH-22-06	BH-23-06	BH-24-06	BH-25-06	BH-26-06	BH-27-06	BH-27-09
Sample Date				23-Mar-06	20-Mar-06	20-Mar-06	21-Mar-06	21-Mar-06	21-Mar-06	21-Mar-06	24-Mar-06	23-Mar-06	8-Apr-09
Sample ID				BH-14-06-032306-0.5-1	BH-20-06-032006-1-1.5	BH-21-06-032006-1.5-2	BH-22-06-032106-1.5-2	BH-23-06-032106-1-1.5	BH-24-06-032106-1-1.5	BH-25-06-032106-1-1.5	BH-26-06-032406-0.5-1	BH-27-06-032306-1-1.5	BH-27-09
Sample Depth				0.5 - 1 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	0.5 - 1 ft	1 - 1.5 ft	0 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4739182	4734389	4734390	4734394	4734391	4734392	4734393	4738884	4736392	5643349
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	-	0.290 (0.016)	0.340 (0.017)	ND (0.004) (0.0003)	ND (0.210) (0.017)	ND (0.170) (0.015)	***2.3***[B] (0.018)	***180***[B] (1.6)	***2.2***[B] (0.016)	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	-	*ND (0.200)* (0.031)	*ND (0.190)* (0.035)	ND (0.004) (0.0006)	*ND (0.210)* (0.033)	*ND (0.170)* (0.03)	*ND (0.220)* (0.035)	*ND (0.180)* (0.033)	*ND (0.180)* (0.031)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	-	ND (0.200) (0.031)	ND (0.190) (0.035)	ND (0.004) (0.0006)	ND (0.210) (0.033)	ND (0.170) (0.03)	ND (0.220) (0.035)	ND (0.180) (0.033)	ND (0.180) (0.031)	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	-	0.460 (0.031)	0.810 (0.035)	ND (0.004) (0.0006)	ND (0.210) (0.033)	ND (0.170) (0.03)	0.300 (0.035)	2.7 (0.033)	1.6 (0.031)	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	-	9.7 (0.31)	32 (0.35)	ND (0.004) (0.0006)	0.810 (0.033)	9.9 (0.03)	2.7 (0.035)	800 (3.3)	9.1 (0.031)	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	-	ND (0.200) (0.016)	ND (0.190) (0.017)	ND (0.004) (0.0003)	ND (0.210) (0.017)	ND (0.170) (0.015)	ND (0.220) (0.018)	ND (0.180) (0.016)	ND (0.180) (0.016)	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	-	0.410 (0.031)	ND (0.190) (0.035)	ND (0.004) (0.0006)	ND (0.210) (0.033)	0.200 (0.03)	1.7 (0.035)	***260***[B] (3.3)	ND (0.180) (0.031)	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	-	1.0 (0.031)	0.830 (0.035)	ND (0.004) (0.0006)	0.370 (0.033)	0.560 (0.03)	1.1 (0.035)	9.3 (0.033)	0.770 (0.031)	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	-	2.5 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	1.3 (0.1)	3.9 (0.33)	10 (0.33)	ND (0.180) (0.033)	3.3 (0.33)	-
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	-	3.8 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	0.790 (0.1)	ND (1.9) (0.33)	5.3 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	-	4.9 (0.33)	ND (1.8) (0.33)	0.350 (0.033)	1.1 (0.1)	ND (1.9) (0.33)	6.0 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	-	6.3 (0.33)	ND (1.8) (0.33)	0.400 (0.033)	1.2 (0.1)	ND (1.9) (0.33)	8.1 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	-	2.9 (0.33)	ND (1.8) (0.33)	0.290 (0.033)	0.890 (0.1)	ND (1.9) (0.33)	3.6 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-
CHRYSENE	mg/kg	760[A]	230[B]	-	4.2 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	1.3 (0.1)	2.0 (0.33)	4.8 (0.33)	ND (0.180) (0.033)	ND (1.9) (0.33)	-
FLUORENE	mg/kg	130000[A]	3800[B]	-	71 (0.67)	ND (1.8) (0.33)	ND (0.190) (0.033)	3.5 (0.1)	63 (0.67)	120 (1.7)	ND (0.180) (0.033)	16 (0.33)	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	ND (2.1) (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	0.980 (0.1)	ND (1.9) (0.33)	2.4 (0.33)	ND (0.180) (0.033)	12 (0.33)	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	-	37 (0.33)	ND (1.8) (0.33)	ND (0.190) (0.033)	7.4 (0.1)	46 (0.33)	120 (1.7)	0.210 (0.033)	36 (0.33)	-
PYRENE	mg/kg	96000[A]	2200[B]	-	6.9 (0.33)	ND (1.8) (0.33)	0.220 (0.033)	1.6 (0.1)	5.8 (0.33)	11 (0.33)	0.300 (0.033)	2.0 (0.33)	-
Metals													
LEAD	µg/L	n/v	n/v	1120 (8.4)	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	-	145 (0.757)	286 (0.757)	165 (0.757)	417 (0.772)	233 (0.772)	231 (0.772)	32.6 (0.765)	167 (0.772)	***463***[B] (0.015)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	20.4 (0.5)	9.7 (0.5)	10 (0.5)	20.2 (0.5)	14.4 (0.5)	19.4 (0.5)	9 (0.5)	12.4 (0.5)	14.6 (0.5)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-28-06	BH-28-09	BH-29-06	BH-29-09	BH-30-09	BH-31-09	BH-32-09	GP U 677-1	GP U 677-2	GP U 677-3
Sample Date				23-Mar-06	8-Apr-09	21-Mar-06	8-Apr-09	8-Apr-09	13-Jul-09	13-Jul-09	8-Jun-11	8-Jun-11	8-Jun-11
Sample ID				BH-28-06-032306-1-1.5	BH-28-09	BH-29-06-032106-1.5-2	BH-29-09	BH-30-09	BH-31-09	BH-32-09	GP U 677-1(1.5-2.0)	GP U 677-2(0.8-1.3)	GP U 677-3(1.5-2.0)
Sample Depth				1 - 1.5 ft	0 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft	0.8 - 1.3 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	1250778	1250778	1250778
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4736393	5643346	4734395	5643347	5643348	5722433	5722432	6311687	6311688	6311689
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	***1.3*** [B] (0.033)	-	0.410 (0.018)	-	-	-	-	0.060 J (0.0005)	ND (0.0006) (0.0005)	ND (0.0005) (0.0005)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	*ND (0.380)* (0.066)	-	*ND (0.230)* (0.037)	-	-	-	-	***0.130 J*** [B] (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.380) (0.066)	-	ND (0.230) (0.037)	-	-	-	-	ND (0.070) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
ETHYLBENZENE	mg/kg	890[A]	70[B]	0.670 (0.066)	-	ND (0.230) (0.037)	-	-	-	-	0.110 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	6.4 (0.066)	-	0.990 (0.037)	-	-	-	-	0.700 (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.380) (0.033)	-	ND (0.230) (0.018)	-	-	-	-	ND (0.035) (0.0005)	ND (0.0006) (0.0005)	ND (0.0005) (0.0005)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	0.290 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	0.590 (0.066)	-	ND (0.230) (0.037)	-	-	-	-	0.120 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	0.097 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	ND (0.070) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	0.580 (0.066)	-	0.560 (0.037)	-	-	-	-	0.420 (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	2.5 (0.033)	-	27 (0.33)	-	-	-	-	0.780 (0.00067)	0.037 J (0.00067)	0.500 (0.00067)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	4.0 (0.033)	-	70 (1.7)	-	-	-	-	1.0 (0.00033)	0.110 (0.00033)	1.2 (0.00033)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	4.2 (0.17)	-	***59*** [AB] (1.7)	-	-	-	-	1.2 (0.00033)	0.120 (0.00033)	1.2 (0.00033)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	6.0 (0.17)	-	75 (1.7)	-	-	-	-	0.800 (0.00027)	0.091 (0.00027)	0.850 (0.00027)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	1.9 (0.033)	-	29 (0.33)	-	-	-	-	1.7 (0.0020)	0.190 J (0.0020)	1.5 (0.0020)
CHRYSENE	mg/kg	760[A]	230[B]	4.3 (0.033)	-	73 (1.7)	-	-	-	-	2.0 (0.0030)	0.160 (0.0030)	1.6 (0.0030)
FLUORENE	mg/kg	130000[A]	3800[B]	12 (0.17)	-	14 (0.33)	-	-	-	-	1.3 (0.0033)	ND (0.085) (0.0033)	0.390 (0.0033)
NAPHTHALENE	mg/kg	760[A]	25[B]	1.0 (0.033)	-	2.4 (0.33)	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	16 (0.17)	-	91 (1.7)	-	-	-	-	2.2 (0.0020)	0.090 J (0.0020)	1.6 (0.0020)
PYRENE	mg/kg	96000[A]	2200[B]	8.9 (0.17)	-	110 (1.7)	-	-	-	-	1.5 (0.0033)	0.240 J (0.0033)	2.3 (0.0033)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	200 (0.757)	***993*** [B] (0.015)	***2520*** [AB] (0.772)	409 (0.015)	***2310*** [AB] (0.015)	***501*** [B] (0.02)	186 (0.02)	***453*** [B] (0.220)	67.0 (0.220)	***451*** [B] (0.220)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	12.8 (0.5)	23 (0.5)	20.2 (0.5)	10.1 (0.5)	15.1 (0.5)	7.5 (0.5)	9.7 (0.5)	21.1 (0.50)	21.2 (0.50)	22.2 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP U 677-4	GP U 677-5	GP 797-HA-1	GP 797-HA-2	GP 797-HA-3		GP 797-HA-4	GP-1088-SS-1	GP-1088-SS-2	GP-1088-SS-3
Sample Date				8-Jun-11	8-Jun-11	29-Aug-02	24-May-02	24-May-02	24-May-02	24-May-02	26-Mar-08	26-Mar-08	26-Mar-08
Sample ID				GP U 677-4(0.3-0.8)	GP U 677-5(0.8-1.3)	HA-1 (1-1.5)	HA-2 (1-1.5)	HA-3 (1-1.5)	HA-3 (2)	HA-4 (1-1.5)	GP-1088-SS-1	GP-1088-SS-2	GP-1088-SS-3
Sample Depth				0.3 - 0.8 ft	0.8 - 1.3 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	WGI	WGI	WGI	WGI	WGI	LL	LL	LL
Laboratory Work Order		A	B	1250778	1250778	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	1083612	1083612	1083612
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6311690	6311691	HA-1 (1-1.5)	HA-2 (1-1.5)	HA-3 (1-1.5)	HA-3 (2)	HA-4 (1-1.5)	5315612	5315613	5315614
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)	***920 D[AB]*** ()	***28 D[B]*** ()	***310 D[AB]*** ()	***170 D[B]*** ()	***190 D[B]*** ()	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	ND (0.001) (0.001)	ND (0.001) (0.001)	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	ND (0.001) (0.001)	ND (0.001) (0.001)	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	ND (0.001) (0.001)	ND (0.001) (0.001)	***80 J D[B]*** ()	0.85 ()	37 J D ()	8.5 ()	55 D ()	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	ND (0.001) (0.001)	ND (0.001) (0.001)	1600 D ()	17 D ()	1000 D ()	230 D ()	950 D ()	-	-	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	310 D ()	4.5 ()	140 D ()	29 D ()	210 D ()	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)	ND (0.24) ()	ND (0.26) ()	ND (0.27) ()	ND (0.25) ()	ND (0.25) ()	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	ND (0.001) (0.001)	0.160 (0.001)	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	71 D ()	1.4 ()	29 J D ()	7.7 ()	50 J D ()	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.001) (0.001)	0.001 J (0.001)	***1800 D[B]*** ()	11 D ()	***920 D[B]*** ()	***300 D[B]*** ()	***660 D[B]*** ()	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	ND (0.001) (0.001)	0.056 (0.001)	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.001) (0.001)	0.046 (0.001)	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	ND (0.001) (0.001)	0.005 (0.001)	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	ND (0.028) (0.00067)	0.990 (0.00067)	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.031 (0.00033)	ND (0.590) (0.00033)	-	-	-	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.050 (0.00033)	0.620 (0.00033)	-	-	-	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.053 (0.00027)	0.810 (0.00027)	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.130 J (0.0020)	1.4 (0.0020)	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760[A]	230[B]	0.250 (0.0030)	4.3 (0.0030)	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000[A]	3800[B]	ND (0.071) (0.0033)	2.5 (0.0033)	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	0.65 ()	ND (0.26) ()	0.41 ()	0.3 ()	0.29 ()	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.095 J (0.0020)	5.2 (0.0020)	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000[A]	2200[B]	ND (0.370) (0.0033)	ND (17) (0.0033)	-	-	-	-	-	-	-	-
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	47.8 (0.220)	18.5 (0.220)	-	-	-	-	-	-	-	-
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	6.1 (0.50)	6.9 (0.50)	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	11.2 (0.0100)	10.4 (0.0100)	10.1 (0.0100)
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-1088-SS-4	GP-1088-SS-5	GP-1088-SS-6	GP-1088-SS-7	GP-1088-SS-8	GP-201-SS-1	GP-201-SS-2	GP-201-SS-3	GP-201-SS-4	GP-201-SS-5
Sample Date				26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08	26-Mar-08
Sample ID				GP-1088-SS-4	GP-1088-SS-5	GP-1088-SS-6	GP-1088-SS-7	GP-1088-SS-8	GP-201-SS-1	GP-201-SS-2	GP-201-SS-3	GP-201-SS-4	GP-201-SS-5
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1083612	1083612	1083612	1083612	1083612	1083613	1083613	1083613	1083613	1083613
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5315615	5315616	5315617	5315618	5315619	5315620	5315621	5315622	5315623	5315624
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	-	-	-	-	-	-	-	-	-	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	-	-	-	-	-	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	-	-	-	-	-	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	-	-	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760[A]	230[B]	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000[A]	3800[B]	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	-	-	-	-	-	-	-	-	-	-
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	10.3 (0.0100)	10.7 (0.0100)	11.6 (0.0100)	10.1 (0.0100)	10.5 (0.0100)	8.88 (0.01)	9.00 (0.01)	8.53 (0.01)	8.55 (0.01)	8.88 (0.01)
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-201-SS-6	GP-201-SS-7	GP676-1	GP676-2	GP676-3	GP676-4	GP676-5	GP676-6	GP676-7	GP676-8
Sample Date				26-Mar-08	26-Mar-08	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16
Sample ID				GP-201-SS-6	GP-201-SS-7	GP676-1-(1.5')-20160428	GP676-2-(1.5')-20160428	GP676-3-(1.5')-20160428	GP676-4-(1.5')-20160428	GP676-5-(1.5')-20160428	GP676-6-(1.5')-20160428	GP676-7-(1.5')-20160428	GP676-8-(1.5')-20160428
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	1.5 ft	1.5 ft	1.5 ft	1.5 ft	1.5 ft	1.5 ft	1.5 ft	1.5 ft
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1083613	1083613	1655906	1655906	1655906	1655906	1655906	1655906	1655906	1655906
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5315625	5315626	8358306	8358307	8358308	8358309	8358310	8358311	8358312	8358313
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	-	-	0.051 J (0.0005)	ND (0.064) (0.0005)	ND (0.13) (0.0005)	ND (0.0007) (0.0005)	ND (0.031) (0.0005)	ND (0.033) (0.0005)	ND (0.035) (0.0005)	ND (0.033) (0.0005)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890[A]	70[B]	-	-	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	-	-	-	-	-	-	-	-	-	-
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	0.37 J (0.001)	ND (0.13) (0.001)	ND (0.25) (0.001)	ND (0.001) (0.001)	0.094 J (0.001)	0.14 J (0.001)	ND (0.070) (0.001)	ND (0.067) (0.001)
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	-	-	0.50 (0.003)	8.0 (0.003)	0.42 (0.003)	1.2 (0.003)	0.67 (0.003)	0.29 (0.003)	1.0 J (0.003)	0.97 (0.003)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	-	-	0.93 (0.003)	9.3 (0.003)	0.81 (0.003)	2.9 (0.003)	1.9 (0.003)	0.68 (0.003)	0.83 J (0.003)	1.5 (0.003)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	-	-	0.93 (0.003)	5.2 (0.003)	0.87 (0.003)	3.8 (0.003)	1.9 (0.003)	0.56 (0.003)	1.5 (0.003)	0.86 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	-	-	1.1 (0.003)	2.6 (0.003)	1.2 (0.003)	4.2 (0.003)	2.2 (0.003)	0.40 (0.003)	0.61 J (0.003)	0.46 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	-	-	0.75 (0.003)	1.7 (0.003)	0.66 (0.003)	2.9 (0.003)	1.3 (0.003)	0.25 (0.003)	1.2 (0.003)	0.36 (0.003)
CHRYSENE	mg/kg	760[A]	230[B]	-	-	0.99 (0.003)	15 (0.003)	0.99 (0.003)	3.0 (0.003)	2.0 (0.003)	1.2 (0.003)	3.1 (0.003)	2.2 (0.003)
FLUORENE	mg/kg	130000[A]	3800[B]	-	-	0.24 (0.003)	9.8 (0.003)	0.39 (0.003)	0.46 (0.003)	0.27 (0.003)	0.28 (0.003)	1.0 J (0.003)	0.85 (0.003)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	-	-	1.3 (0.003)	38 (0.003)	1.0 (0.003)	3.4 (0.003)	1.3 (0.003)	1.3 (0.003)	4.0 (0.003)	3.4 (0.003)
PYRENE	mg/kg	96000[A]	2200[B]	-	-	1.2 (0.003)	18 (0.003)	1.0 (0.003)	3.1 (0.003)	2.0 (0.003)	1.4 (0.003)	3.7 (0.003)	2.8 (0.003)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	-	-	-	-	-	-	-	-	-	-
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	-	-	26.4 (0.50)	17.3 (0.50)	32.3 (0.50)	28.9 (0.50)	17.9 (0.50)	18.6 (0.50)	16.9 (0.50)	23.2 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	7.89 (0.01)	7.99 (0.01)	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP676-9	SR-31-1	SR-31-2	SR-31-3	SR-31-4	SR-31-5	SR-31-6	SR-31-7	SR-31-8	SR-31-9
Sample Date				28-Apr-16	7-Jun-11	7-Jun-11	7-Jun-11	7-Jun-11	7-Jun-11	7-Jun-11	7-Jun-11	7-Jun-11	7-Jun-11
Sample ID				GP676-9-(1.5')-20160428	SR-31-1(1.3-1.8)	SR-31-2(0.9-1.4)	SR-31-3(0.8-1.3)	SR-31-4(0.9-1.4)	SR-31-5(0.8-1.3)	SR-31-6(1.0-1.5)	SR-31-7(1.1-1.6)	SR-31-8(0.5-1.0)	SR-31-9(1.2-1.7)
Sample Depth				1.5 ft	1.3 - 1.8 ft	0.9 - 1.4 ft	0.8 - 1.3 ft	0.9 - 1.4 ft	0.8 - 1.3 ft	1 - 1.5 ft	1.1 - 1.6 ft	0.5 - 1 ft	1.2 - 1.7 ft
Sampling Company				STANTEC	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1655906	1250778	1250778	1250778	1250778	1250778	1250778	1250778	1250778	1250778
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8358314	6311678	6311679	6311680	6311681	6311682	6311683	6311684	6311685	6311686
Volatile Organic Compounds													
BENZENE	mg/kg	290[A]	0.5[B]	ND (0.038) (0.0005)	0.044 (0.0005)	0.002 J (0.0005)	0.003 J (0.0005)	0.001 J (0.0005)	ND (0.065) (0.0005)	ND (0.045) (0.0005)	0.001 J (0.0005)	0.005 J (0.0005)	ND (0.0006) (0.0005)
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7[A]	0.005[B]	-	ND (0.003) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	*ND (0.130)* (0.001)	*ND (0.089)* (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86[A]	0.5[B]	-	ND (0.003) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
ETHYLBENZENE	mg/kg	890[A]	70[B]	-	0.015 (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	-	0.006 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
M, P-XYLENES	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600[A]	2[B]	-	ND (0.001) (0.0005)	ND (0.0009) (0.0005)	ND (0.0008) (0.0005)	ND (0.0008) (0.0005)	ND (0.065) (0.0005)	ND (0.045) (0.0005)	ND (0.0009) (0.0005)	ND (0.0007) (0.0005)	ND (0.0006) (0.0005)
NAPHTHALENE	mg/kg	760[A]	25[B]	ND (0.077) (0.001)	0.008 J (0.001)	0.006 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	0.200 J (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
O-XYLENE (1,2-DIMETHYLBENZENE)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	-	0.041 (0.001)	0.002 J (0.001)	0.002 J (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	0.002 J (0.001)	ND (0.001) (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	560[A]	35[B]	-	0.038 (0.001)	ND (0.002) (0.001)	0.002 J (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	-	0.150 (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000[A]	1000[B]	-	0.110 (0.001)	0.002 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)	ND (0.130) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)
Semi-Volatile Organic Compounds													
ANTHRACENE	mg/kg	190000[A]	350[B]	1.9 (0.003)	0.089 (0.00067)	0.380 (0.00067)	0.180 (0.00067)	0.034 J (0.00067)	0.110 (0.00067)	0.260 (0.00067)	0.100 (0.00067)	0.050 J (0.00067)	0.140 (0.00067)
BENZO(A)ANTHRACENE	mg/kg	130[A]	130[B]	0.61 J (0.003)	0.540 (0.00033)	2.9 (0.00033)	0.730 (0.00033)	0.190 (0.00033)	0.340 (0.00033)	2.0 (0.00033)	0.380 (0.00033)	0.370 (0.00033)	0.580 (0.00033)
BENZO(A)PYRENE	mg/kg	12[A]	12[B]	0.59 J (0.003)	0.640 (0.00033)	2.8 (0.00033)	0.810 (0.00033)	0.220 (0.00033)	0.420 (0.00033)	1.8 (0.00033)	0.440 (0.00033)	0.470 (0.00033)	0.770 (0.00033)
BENZO(B)FLUORANTHENE	mg/kg	76[A]	76[B]	0.66 J (0.003)	0.570 (0.00027)	2.6 (0.00027)	0.620 (0.00027)	0.190 (0.00027)	0.350 (0.00027)	1.6 (0.00027)	0.360 (0.00027)	0.380 (0.00027)	0.680 (0.00027)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.67 J (0.003)	0.830 (0.0020)	3.3 (0.0020)	0.950 (0.0020)	0.330 (0.0020)	0.610 (0.0020)	2.2 (0.0020)	0.590 (0.0020)	0.620 (0.0020)	1.0 (0.0020)
CHRYSENE	mg/kg	760[A]	230[B]	0.99 J (0.003)	0.890 (0.0030)	4.0 (0.0030)	1.2 (0.0030)	0.360 (0.0030)	0.680 (0.0030)	2.5 (0.0030)	0.570 (0.0030)	0.590 (0.0030)	1.0 (0.0030)
FLUORENE	mg/kg	130000[A]	3800[B]	3.1 (0.003)	0.160 J (0.0033)	0.370 J (0.0033)	ND (0.190) (0.0033)	ND (0.100) (0.0033)	ND (0.120) (0.0033)	0.180 J (0.0033)	ND (0.110) (0.0033)	ND (0.093) (0.0033)	0.120 J (0.0033)
NAPHTHALENE	mg/kg	760[A]	25[B]	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	13 (0.003)	0.490 (0.0020)	1.4 (0.0020)	0.660 (0.0020)	0.130 J (0.0020)	0.250 (0.0020)	1.0 (0.0020)	0.420 (0.0020)	0.200 (0.0020)	0.480 (0.0020)
PYRENE	mg/kg	96000[A]	2200[B]	2.6 (0.003)	1.2 (0.0033)	5.0 (0.0033)	1.5 (0.0033)	0.460 (0.0033)	0.730 (0.0033)	3.6 (0.0033)	0.690 (0.0033)	0.660 (0.0033)	1.2 (0.0033)
Metals													
LEAD	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240[A]	450[B]	-	***1120*** [B] (0.220)	***898*** [B] (0.220)	***774*** [B] (0.220)	***2210*** [B] (0.220)	***1890*** [B] (0.220)	***780*** [B] (0.220)	***1370*** [B] (0.220)	***1560*** [B] (0.220)	***830*** [B] (0.220)
General Chemistry													
MOISTURE, PERCENT	%	n/v	n/v	22.8 (0.50)	31.1 (0.50)	37.4 (0.50)	33.3 (0.50)	36.1 (0.50)	46.5 (0.50)	28.1 (0.50)	36.8 (0.50)	28.3 (0.50)	25.4 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-

Table K.2

Historical Soil Analytical Results Summary - AOI 6 (0-2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016
A	Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft). Lead value is the site-specific standard.
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
B	PADEP Non-Residential Statewide Health Standards (0-2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
D	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
µg/L	Micrograms per liter.
S.U.	Standard Units.
ft	Feet
LL	Eurofins Lancaster Laboratories Environmental
PIP	Pace Analytical Services, Inc.
	Method detection limit is shown in second set of parentheses.

Table K.3

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-101	AOI6 BH-12-102	AOI6 BH-12-105	AOI6 BH-12-106	AOI6 BH-12-107	AOI6 BH-12-108	AOI6 BH-12-109	AOI6 BH-12-110	AOI6 BH-12-114	AOI6 BH-12-116	AOI6 BH-12-117	AOI6 BH-12-118	AOI6 BH-12-121	AOI6 BH-12-122	AOI6 BH-12-123	AOI6 BH-12-124	AOI6 BH-12-125	AOI6 BH-12-126	AOI6 BH-12-127	AOI6 BH-12-128
Sample Date				4-Dec-12	4-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	3-Dec-12	4-Dec-12	3-Dec-12	3-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12	4-Dec-12
Sample ID				BH-12-101_2-3'	BH-12-102_2-2.5'	BH-12-105_2-2.5'	BH-12-106_2-2.5'	BH-12-107_2.5-3'	BH-12-108_2-2.5'	BH-12-109_3'	BH-12-110_3-3.5'	BH-12-114_3-3.5'	BH-12-116_3.5'	BH-12-117_2-2.5'	BH-12-118_2-2.5'	BH-12-121_2-2.5'	BH-12-122_2.5-3'	BH-12-123_2-2.5'	BH-12-124_3-3.5'	BH-12-125_2.5-3'	BH-12-126_2.5-3'	BH-12-127_2.5-3'	BH-12-128_3-3.5'
Sample Depth				2 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft	3 - 3.5 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22962	JB22962	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22822	JB22962	JB22822	JB22822	JB22962	JB22962	JB22962	JB22962	JB22962	JB22962
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-19	JB22962-18	JB22822-7	JB22822-9	JB22822-4	JB22822-13	JB22822-16	JB22822-5	JB22822-14	JB22822-17	JB22822-19	JB22962-17	JB22822-21	JB22822-20	JB22962-2	JB22962-3	JB22962-12	JB22962-8	JB22962-10	JB22962-9
Volatile Organic Compounds																							
BENZENE	mg/kg	330[A]	0.5[B]	0.121 (0.0075)	ND (0.13) (0.016)	***5.21***[B] (0.042)	0.0011 (0.00011)	0.00066 J (0.00013)	***11.2***[B] (0.028)	0.476 (0.0073)	***4.09***[B] (0.042)	0.245 (0.0070)	0.0680 (0.0066)	0.157 (0.0082)	0.00051 J (0.00012)	0.0100 (0.00010)	***1.83***[B] (0.0066)	***2.07***[B] (0.0059)	***1380***[AB] (2.8)	ND (2.5) (0.29)	***87.2***[B] (3.0)	***149***[B] (0.30)	***535***[AB] (1.5)
CYCLOHEXANE	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3[A]	0.005[B]	ND (0.063) (0.0080)	ND (0.13) (0.017)	ND (0.36) (0.045)	ND (0.00094) (0.00012)	ND (0.0011) (0.00014)	ND (0.23) (0.030)	ND (0.061) (0.0078)	ND (0.35) (0.045)	ND (0.059) (0.0075)	ND (0.056) (0.0071)	ND (0.069) (0.0088)	ND (0.00099) (0.00013)	ND (0.00084) (0.00011)	ND (0.056) (0.0071)	ND (0.049) (0.0062)	ND (0.47) (0.060)	ND (2.5) (0.31)	ND (0.26) (0.032)	ND (0.050) (0.0064)	ND (0.050) (0.0064)
1,2-DICHLOROETHANE (EDC)	mg/kg	98[A]	0.5[B]	ND (0.063) (0.0086)	ND (0.13) (0.018)	ND (0.36) (0.048)	ND (0.00094) (0.00013)	ND (0.0011) (0.00014)	ND (0.23) (0.032)	ND (0.061) (0.0082)	ND (0.35) (0.048)	ND (0.059) (0.0080)	ND (0.056) (0.0075)	ND (0.069) (0.0093)	ND (0.00099) (0.00013)	ND (0.00084) (0.00011)	ND (0.056) (0.0075)	ND (0.049) (0.0066)	ND (0.47) (0.064)	ND (2.5) (0.33)	ND (0.26) (0.034)	ND (0.050) (0.0068)	ND (0.050) (0.0068)
ETHYLBENZENE	mg/kg	1000[A]	70[B]	0.0679 (0.017)	ND (0.13) (0.035)	0.976 (0.094)	ND (0.00094) (0.00025)	ND (0.0011) (0.00028)	***109***[B] (0.61)	0.153 (0.016)	0.712 (0.093)	0.107 (0.016)	0.0714 (0.015)	0.0258 J (0.018)	ND (0.00099) (0.00026)	0.00029 J (0.00022)	0.191 (0.015)	0.464 (0.013)	5.87 (0.12)	ND (2.5) (0.65)	14.6 (0.067)	18.7 (0.66)	57.8 (0.33)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	0.382 (0.0047)	1.18 (0.0098)	5.76 (0.026)	0.00068 J (0.000070)	ND (0.0053) (0.000079)	58.7 (0.17)	1.55 (0.0045)	23.1 (0.026)	0.387 (0.0044)	0.524 (0.0041)	0.797 (0.0051)	0.00031 J (0.000074)	0.0017 J (0.000062)	0.720 (0.0041)	16.9 (0.018)	2110 (1.8)	64.2 (0.18)	678 (1.9)	374 (0.19)	919 (0.94)
METHYL TERTIARY BUTYL ETHER	mg/kg	9900[A]	2[B]	ND (0.063) (0.015)	ND (0.13) (0.031)	ND (0.36) (0.084)	ND (0.00094) (0.00022)	ND (0.0011) (0.00025)	ND (0.23) (0.055)	ND (0.061) (0.014)	ND (0.35) (0.083)	ND (0.059) (0.014)	ND (0.056) (0.013)	ND (0.069) (0.016)	ND (0.00099) (0.00023)	ND (0.00084) (0.00020)	ND (0.056) (0.013)	ND (0.049) (0.012)	ND (0.47) (0.11)	ND (2.5) (0.58)	ND (0.26) (0.060)	ND (0.050) (0.012)	ND (0.050) (0.012)
HEXANE	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000[A]	25[B]	0.0387 J (0.0077)	ND (0.66) (0.016)	0.966 J (0.043)	0.0020 J (0.00011)	ND (0.0053) (0.00013)	***65.2***[B] (0.28)	0.512 (0.0074)	2.49 (0.043)	0.197 J (0.0072)	0.161 J (0.0068)	0.0757 J (0.0084)	ND (0.0050) (0.00012)	0.0018 J (0.00010)	0.500 (0.0068)	1.11 (0.0060)	0.479 J (0.058)	ND (12) (0.30)	0.304 J (0.031)	0.103 J (0.0061)	0.154 J (0.0062)
BUTYLBENZENE, SEC-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	0.0940 (0.0067)	0.0547 J (0.014)	0.330 J (0.037)	ND (0.00094) (0.000098)	ND (0.0011) (0.00011)	5.26 (0.025)	0.0993 (0.0064)	0.889 (0.037)	0.224 (0.0062)	0.100 (0.0058)	0.0813 (0.0072)	0.00026 J (0.00010)	0.0020 (0.000088)	0.261 (0.0058)	0.722 (0.0052)	***1640***[B] (2.5)	ND (2.5) (0.26)	***197***[B] (2.7)	***339***[B] (0.26)	***1050***[B] (1.3)
1,2,4-TRIMETHYLBENZENE	mg/kg	640[A]	35[B]	0.0245 J (0.013)	ND (0.66) (0.027)	3.11 (0.074)	ND (0.0047) (0.00020)	ND (0.0053) (0.00022)	***455***[B] (2.0)	0.121 J (0.013)	4.23 (0.074)	0.131 J (0.012)	0.135 J (0.012)	0.0555 J (0.014)	ND (0.0050) (0.00021)	0.0022 J (0.00018)	0.291 (0.012)	0.593 (0.010)	3.46 (0.099)	ND (12) (0.51)	4.62 (0.053)	3.04 (0.011)	6.32 (0.011)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.32) (0.010)	ND (0.66) (0.021)	1.01 J (0.057)	ND (0.0047) (0.00015)	ND (0.0053) (0.00017)	191 (0.37)	0.0553 J (0.0098)	1.13 J (0.057)	0.0385 J (0.0094)	0.0469 J (0.0089)	ND (0.35) (0.011)	ND (0.0050) (0.00016)	0.0018 J (0.00013)	0.105 J (0.0089)	0.240 J (0.0079)	1.21 J (0.076)	ND (12) (0.39)	2.08 (0.041)	1.41 (0.0080)	2.92 (0.0081)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100[A]	1000[B]	0.276 (0.0088)	0.0965 J (0.018)	4.24 (0.050)	ND (0.00094) (0.00013)	ND (0.0011) (0.00015)	675 (0.32)	0.170 (0.0085)	2.72 (0.049)	0.612 (0.0082)	0.245 (0.0077)	0.0616 J (0.0096)	ND (0.00099) (0.00014)	0.00097 (0.00012)	0.407 (0.0077)	0.924 (0.0068)	22.6 (0.066)	0.738 J (0.34)	68.5 (0.035)	83.6 (0.35)	248 (0.18)
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																							
ACENAPHTHENE	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000[A]	350[B]	0.0217 J (0.013)	1.02 (0.017)	0.746 (0.012)	2.34 (0.012)	1.97 (0.012)	2.23 (0.011)	3.49 (0.025)	8.81 (0.52)	0.310 (0.013)	0.142 (0.012)	0.262 (0.014)	0.151 (0.012)	3.43 (0.11)	0.625 (0.011)	2.32 (0.012)	ND (0.033) (0.012)	ND (0.035) (0.012)	ND (0.073) (0.026)	ND (0.032) (0.011)	ND (0.035) (0.012)
BENZO(A)ANTHRACENE	mg/kg	190000[A]	430[B]	0.0907 (0.012)	0.276 (0.016)	1.85 (0.011)	10.9 (0.23)	4.21 (0.11)	6.04 (0.10)	10.9 (0.23)	22.3 (0.48)	0.699 (0.013)	0.233 (0.011)	0.436 (0.013)	0.608 (0.012)	9.60 (0.10)	1.05 (0.010)	8.99 (0.11)	0.0210 J (0.011)	0.0226 J (0.012)	0.0707 J (0.024)	0.0184 J (0.010)	ND (0.035) (0.011)
BENZO(A)PYRENE	mg/kg	190000[A]	46[B]	0.112 (0.011)	0.246 (0.015)	1.55 (0.011)	11.6 (0.22)	3.59 (0.11)	5.93 (0.097)	10.5 (0.22)	20.6 (0.45)	0.653 (0.012)	0.269 (0.011)	0.534 (0.012)	0.602 (0.011)	9.39 (0.098)	1.06 (0.0097)	7.91 (0.11)	0.0179 J (0.010)	ND (0.035) (0.011)	0.0491 J (0.022)	0.0138 J (0.0097)	ND (0.035) (0.011)
BENZO(B)FLUORANTHENE	mg/kg	190000[A]	170[B]	0.122 (0.012)	0.376 (0.016)	1.48 (0.012)	14.0 (0.24)	3.49 (0.12)	8.41 (0.11)	13.9 (0.24)	24.3 (0.49)	0.615 (0.013)	0.328 (0.012)	0.446 (0.013)	0.616 (0.012)	9.66 (0.11)	1.21 (0.011)	9.36 (0.12)	ND (0.033) (0.011)	ND (0.035) (0.012)	0.0556 J (0.024)	ND (0.032) (0.011)	ND (0.035) (0.012)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.0816 (0.014)	0.304 (0.018)	1.15 (0.013)	7.06 (0.26)	2.53 (0.013)	4.07 (0.12)	6.29 (0.027)	11.9 (0.55)	0.537 (0.014)	0.302 (0.013)	0.488 (0.014)	0.343 (0.013)	5.39 (0.12)	0.764 (0.012)	3.58 (0.13)	ND (0.033) (0.012)	ND (0.035) (0.013)	0.0291 J (0.027)	ND (0.032) (0.012)	ND (0.035) (0.013)
BENZO(K)FLUORANTHENE	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	190000[A]	230[B]	0.0917 (0.012)	0.400 (0.017)	1.82 (0.012)	11.1 (0.24)	3.92 (0.12)	7.37 (0.11)	13.7 (0.24)	22.0 (0.50)	0.872 (0.013)	0.290 (0.012)	0.664 (0.013)	0.599 (0.012)	10.5 (0.11)	1.28 (0.011)	8.28 (0.12)	0.0197 J (0.011)	0.0298 J (0.012)	0.0845 (0.025)	0.0164 J (0.011)	ND (0.035) (0.012)
DIBENZ(A,H)ANTHRACENE	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	190000[A]	3800[B]	0.0199 J (0.012)	5.64 (0.081)	2.30 (0.011)	0.818 (0.012)	0.848 (0.011)	15.8 (0.10)	6.98 (0.023)	11.4 (0.48)	0.177 (0.013)	0.120 (0.011)	0.0701 (0.013)	0.0297 J (0.012)	2.89 (0.010)	1.30 (0.010)	3.39 (0.012)	ND (0.033) (0.011)	ND (0.035) (0.012)	0.0340 J (0.024)	ND (0.032) (0.010)	ND (0.035) (0.012)
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.0748 (0.017)	10.4 (0.11)	3.34 (0.016)	10.7 (0.32)	7.48 (0.16)	18.5 (0.14)	24.9 (0.32)	44.4 (0.67)	0.751 (0.017)	0.318 (0.016)	0.374 (0.018)	0.248 (0.016)	22.9 (0.15)	2.03 (0.014)	6.10 (0.16)	0.0626 (0.015)	0.0208 J (0.016)	0.115 (0.033)	0.0161 J (0.015)	ND (0.035) (0.016)
PHENOL	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	190000[A]	2200[B]	0.121 (0.014)	1.05 (0.019)	2.89 (0.013)	18.7 (0.27)	7.59 (0.13)	11.3 (0.12)	19.7 (0.27)	41.9 (0.57)	1.24 (0.015)	0.446 (0.013)	0.984 (0.015)	0.728 (0.014)	23.1 (0.12)	1.95 (0.012)	11.3 (0.14)	0.0317 J (0.013)	0.0363 (0.014)	0.123 (0.028)	0.0207 J (0.012)	ND (0.035) (0.013)
PYRIDINE	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																							
COBALT	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	190000[A]	450[B]	56.3 (0.13)	283 (0.18)	341 (0.14)	***960***[B] (0.26)	***546***[B] (0.13)	383 (0.13)	***954***[B] (0.13)	***2930***[B] (0.28)	34.7 (0.14)	***1070***[B] (0.13)	350 (0.14)	93.1 (0.13)	199 (0.12)	173 (0.13)	133 (0.13)	5.5 (0.13)	11.4 (0.12)	8.7 (0.13)	13.8 (0.13)	6.5 (0.14)
NICKEL	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																							
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	84.2 ()	65.9 ()	79.4 ()	83.4 ()	83.9 ()	90.9 ()	83.2 ()	78.3 ()	83.5 ()	83.7 ()	77.6 ()	86.9 ()	90.1 ()	88.1 ()	89.2 ()	89.6 ()	90.5 ()	89.4 ()	88.8 ()	88.1 ()

Table K.3

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6 BH-12-129	AOI6 BH-12-135	AOI6 BH-12-138	AOI6 BH-12-149	AOI6-BH-16-007	AOI6-BH-16-008	AOI6-BH-16-014		AOI6-BH-16-015		AOI6-BH-16-016		AOI6-BH-16-022	AOI6-BH-16-027	AOI6-BH-16-029	AOI6-BH-16-030	AOI6-BH-16-031	AOI6-BH-16-032	AOI6-BH-16-033	AOI6-BH-16-034
Sample Date				4-Dec-12	5-Dec-12	5-Dec-12	4-Dec-12	8-Apr-16	8-Apr-16	5-Apr-16	11-Jul-16	5-Apr-16	11-Jul-16	4-Apr-16	11-Jul-16	6-Apr-16	13-Apr-16	13-Apr-16	14-Apr-16	14-Apr-16	13-Apr-16	13-Apr-16	13-Apr-16
Sample ID				BH-12-129_2.5-3'	BH-12-135_2-2.5'	BH-12-138_2-2.5'	BH-12-149_2.5-3'	AOI6-BH-16-007-2-4-SOIL	AOI6-BH-16-008-2-4-SOIL	AOI6-BH-16-014-2-4-SOIL	AOI6-BH-16-014-2-4-071116	AOI6-BH-16-015-2-4-SOIL	AOI6-BH-16-015-2-4-071116	AOI6-BH-16-016-2-4-SOIL	AOI6-BH-16-016-2-4-071116	AOI6-BH-16-022-2-4-SOIL	AOI6-BH-16-027-2-4-SOIL	AOI6-BH-16-029-2-4-SOIL	AOI6-BH-16-030-2-4-SOIL	AOI6-BH-16-031-2-4-SOIL	AOI6-BH-16-032-2-4-SOIL	AOI6-BH-16-033-2-4-SOIL	AOI6-BH-16-034-2-4-SOIL
Sample Depth				2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.25 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.25 ft	2 - 2.1 ft	2 - 2.2 ft	2 - 2.5 ft	2 - 2.25 ft	2.25 - 2.5 ft	2.5 - 2.75 ft	2.25 - 2.5 ft	2.5 - 2.75 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.25 ft	2 - 2.25 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	JB22962	JB23100	JB23100	JB22962	1649742	1649742	1647893	1682991	1647893	1682991	1647893	1682991	1648963	1651423	1651423	1651423	1651423	1651423	1651423	1651423
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22962-7	JB23100-12	JB23100-7	JB22962-5	8329538	8329541	8321193	8475491	8321191	8475489	8321185	8475487	8325915	8336831	8336828	8336848	8336850	8336839	8336837	8336835
Volatile Organic Compounds																							
BENZENE	mg/kg	330[A]	0.5[B]	***1850[AB]*** (6.5)	ND (0.0013) (0.00015)	ND (0.0014) (0.00017)	***517[AB]*** (0.33)	0.004 J (0.0005)	0.001 J (0.0005)	ND (0.440) (0.0005)	-	ND (0.270) (0.0005)	-	ND (0.340) (0.0005)	-	ND (0.005) (0.0005)	***2.500 J[B]*** (0.0005)	***4.500[B]*** (0.0005)	***130.000[B]*** (0.0005)	***27.000[B]*** (0.0005)	***3.700[B]*** (0.0005)	ND (0.210) (0.0005)	***96.000[B]*** (0.0005)
CYCLOHEXANE	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3[A]	0.005[B]	*ND (0.27)* (0.035)	ND (0.0013) (0.00016)	ND (0.0014) (0.00018)	*ND (1.4)* (0.18)	ND (0.005) (0.001)	ND (0.004) (0.001)	*ND (0.440)* (0.001)	-	*ND (0.270)* (0.001)	-	*ND (0.340)* (0.001)	-	ND (0.005) (0.001)	*ND (5.300)* (0.001)	*ND (0.280)* (0.001)	*ND (4.300)* (0.001)	*ND (2.000)* (0.001)	*ND (0.770)* (0.001)	*ND (0.210)* (0.001)	*ND (4.700)* (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98[A]	0.5[B]	ND (0.27) (0.037)	ND (0.0013) (0.00017)	ND (0.0014) (0.00020)	*ND (1.4)* (0.19)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-	ND (0.340) (0.001)	-	ND (0.005) (0.001)	*ND (5.300)* (0.001)	ND (0.280) (0.001)	*ND (4.300)* (0.001)	*ND (2.000)* (0.001)	*ND (0.770)* (0.001)	ND (0.210) (0.001)	*ND (4.700)* (0.001)
ETHYLBENZENE	mg/kg	1000[A]	70[B]	12.6 (0.072)	ND (0.0013) (0.00034)	ND (0.0014) (0.00038)	ND (1.4) (0.37)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-	ND (0.340) (0.001)	-	ND (0.005) (0.001)	ND (5.300) (0.001)	0.810 (0.001)	ND (4.300) (0.001)	2.900 (0.001)	3.600 (0.001)	ND (0.210) (0.001)	1.200 J (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	***6600[B]*** (4.0)	ND (0.0065) (0.000096)	ND (0.0072) (0.00011)	74.7 (0.10)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	0.230 J (0.001)	-	0.440 (0.001)	-	ND (0.005) (0.001)	360.000 (0.001)	10.000 (0.001)	710.000 (0.001)	180.000 (0.001)	110.000 (0.001)	0.130 J (0.001)	360.000 (0.001)
METHYL TERTIARY BUTYL ETHER	mg/kg	9900[A]	2[B]	ND (0.27) (0.064)	0.00071 J (0.00030)	ND (0.0014) (0.00034)	ND (1.4) (0.33)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.440) (0.0005)	-	ND (0.270) (0.0005)	-	ND (0.340) (0.0005)	-	ND (0.005) (0.0005)	*ND (5.300)* (0.0005)	ND (0.280) (0.0005)	*ND (4.300)* (0.0005)	ND (2.000) (0.0005)	ND (0.770) (0.0005)	ND (0.210) (0.0005)	*ND (4.700)* (0.0005)
HEXANE	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000[A]	25[B]	0.898 J (0.033)	-	-	ND (7.0) (0.17)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000[A]	100[B]	***2070[B]*** (5.7)	ND (0.0013) (0.00014)	ND (0.0014) (0.00015)	21.2 (0.15)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.290 J (0.001)	-	ND (0.270) (0.001)	-	0.190 J (0.001)	-	ND (0.005) (0.001)	3.900 J (0.001)	1.200 (0.001)	20.000 (0.001)	22.000 (0.001)	45.000 (0.001)	ND (0.210) (0.001)	81.000 (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	640[A]	35[B]	9.43 (0.057)	ND (0.0065) (0.00027)	ND (0.0072) (0.00030)	ND (7.0) (0.29)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-	0.140 J (0.001)	-	ND (0.005) (0.001)	10.000 (0.001)	1.000 (0.001)	ND (4.300) (0.001)	0.960 J (0.001)	0.700 J (0.001)	ND (0.210) (0.001)	ND (4.700) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	3.38 (0.044)	ND (0.0065) (0.00021)	ND (0.0072) (0.00023)	ND (7.0) (0.23)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.440) (0.001)	-	ND (0.270) (0.001)	-	ND (0.340) (0.001)	-	ND (0.005) (0.001)	9.300 (0.001)	0.480 (0.001)	ND (4.300) (0.001)	0.440 J (0.001)	0.370 J (0.001)	ND (0.210) (0.001)	ND (4.700) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100[A]	1000[B]	51.6 (0.038)	ND (0.0013) (0.00018)	ND (0.0014) (0.00020)	ND (1.4) (0.20)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.100 J (0.001)	-	0.092 J (0.001)	-	0.160 J (0.001)	-	ND (0.005) (0.001)	3.300 J (0.001)	1.500 (0.001)	2.900 J (0.001)	12.000 (0.001)	17.000 (0.001)	ND (0.210) (0.001)	3.800 J (0.001)
Volatile Organic Compounds (SW8011)																							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																							
ACENAPHTHENE	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000[A]	350[B]	ND (0.070) (0.024)	0.485 (0.015)	0.180 (0.032)	ND (0.036) (0.013)	0.840 (0.003)	1.800 (0.003)	-	12.000 (0.003)	-	2.300 (0.003)	-	3.400 (0.003)	0.050 (0.003)	3.400 (0.003)	2.200 (0.003)	0.160 (0.003)	0.014 J (0.003)	0.004 J (0.003)	0.006 J (0.003)	ND (0.092) (0.003)
BENZO(A)ANTHRACENE	mg/kg	190000[A]	430[B]	0.177 (0.023)	0.992 (0.014)	0.424 (0.029)	0.403 (0.012)	2.200 (0.003)	3.700 (0.003)	-	25.000 (0.003)	-	1.200 (0.003)	-	3.300 (0.003)	0.130 (0.003)	2.300 (0.003)	2.800 (0.003)	0.079 (0.003)	0.014 J (0.003)	0.014 J (0.003)	0.026 (0.003)	0.050 J (0.003)
BENZO(A)PYRENE	mg/kg	190000[A]	46[B]	0.121 (0.021)	1.33 (0.013)	0.414 (0.027)	0.452 (0.011)	1.800 (0.003)	2.900 (0.003)	-	26.000 (0.003)	-	1.200 (0.003)	-	3.300 (0.003)	0.140 (0.003)	1.700 (0.003)	2.600 (0.003)	0.079 (0.003)	0.012 J (0.003)	0.013 J (0.003)	0.028 (0.003)	0.039 J (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000[A]	170[B]	0.126 (0.023)	1.20 (0.014)	0.416 (0.030)	0.708 (0.012)	2.300 (0.003)	4.000 (0.003)	-	26.000 (0.003)	-	1.200 (0.003)	-	3.600 (0.003)	0.200 (0.003)	1.700 (0.003)	3.500 (0.003)	0.180 (0.003)	0.019 (0.003)	0.021 (0.003)	0.032 (0.003)	0.084 J (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.0832 (0.026)	1.27 (0.015)	0.378 (0.034)	0.458 (0.013)	1.200 (0.003)	2.000 (0.003)	-	15.000 (0.003)	-	1.600 (0.003)	-	3.500 (0.003)	0.110 (0.003)	1.000 (0.003)	1.700 (0.003)	0.073 (0.003)	0.008 J (0.003)	0.016 J (0.003)	0.029 (0.003)	0.042 J (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	190000[A]	230[B]	0.243 (0.024)	1.07 (0.014)	0.468 (0.030)	0.493 (0.012)	2.100 (0.003)	3.700 (0.003)	-	30.000 (0.003)	-	2.400 (0.003)	-	3.700 (0.003)	0.140 (0.003)	4.000 (0.003)	3.300 (0.003)	0.094 (0.003)	0.020 (0.003)	0.018 J (0.003)	0.032 (0.003)	0.095 (0.003)
DIBENZ(A,H)ANTHRACENE	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	190000[A]	3800[B]	0.182 (0.023)	0.202 (0.014)	0.0565 J (0.030)	ND (0.036) (0.012)	0.310 (0.003)	1.700 (0.003)	-	12.000 (0.003)	-	2.600 (0.003)	-	6.300 (0.003)	0.019 J (0.003)	6.300 (0.003)	8.400 (0.003)	0.034 (0.003)	0.047 (0.003)	0.008 J (0.003)	ND (0.018) (0.003)	0.033 J (0.003)
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000[A]	25[B]	-	0.524 (0.011)	0.0426 J (0.025)	-	0.710 (0.003)	1.500 (0.003)	-	24.000 (0.003)	-	6.300 (0.003)	-	18.000 (0.003)	0.045 (0.003)	7.800 (0.003)	4.800 (0.003)	2.400 (0.003)	0.062 (0.003)	0.029 (0.003)	0.014 J (0.003)	0.160 (0.003)
4-NITROPHENOL	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.437 (0.032)	1.16 (0.019)	0.609 (0.041)	0.154 (0.016)	2.600 (0.003)	8.800 (0.003)	-	37.000 (0.003)	-	7.200 (0.003)	-	17.000 (0.003)	0.160 (0.003)	13.000 (0.003)	10.000 (0.003)	3.300 (0.003)	0.059 (0.003)	0.013 J (0.003)	0.011 J (0.003)	0.120 (0.003)
PHENOL	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	190000[A]	2200[B]	0.406 (0.027)	1.33 (0.016)	0.730 (0.035)	0.601 (0.014)	3.400 (0.003)	7.300 (0.003)	-	39.000 (0.003)	-	3.200 (0.003)	-	4.200 (0.003)	0.210 (0.003)	6.200 (0.003)	5.800 (0.003)	0.140 (0.003)	0.033 (0.003)	0.025 (0.003)	0.042 (0.003)	0.120 (0.003)
PYRIDINE	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																							
COBALT	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	190000[A]	450[B]	107 (0.13)	311 (0.15)	***1150[B]*** (0.16)	127 (0.13)	243 (0.510)	267 (0.510)	352 (0.510)	-	134 (0.510)	-	256 (0.510)	-	101 (0.510)	90.6 (0.510)	137 (0.510)	34.3 (0.510)	6.19 (0.510)	10.6 (0.510)	9.85 (0.510)	15.3 (0.510)
NICKEL	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																							
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	17.6 (0.50)	14.8 (0.50)	44.3 (0.50)	34.8 (0.50)	21.6 (0.50)	30.5 (0.50)	32.5 (0.50)	32.3 (0.50)	10.9 (0.50)	15.0 (0.50)	10.5 (0.50)	11.6 (0.50)	8.6 (0.50)	9.0 (0.50)	5.7 (0.50)	8.9 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	88.5 ()	74.4 ()	70.5 ()	85.0 ()	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.3

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI6-BH-16-035	AOI6-BH-16-036	AOI6-BH-16-043	B-166	B-167	B-172		B-173		B-174		B-175		GP768-1	GP768-2	GP768-3	GP768-4	GP768-5	GP768-6
Sample Date				13-Apr-16	14-Apr-16	7-Apr-16	13-Dec-12	13-Dec-12	6-Apr-16	12-Jul-16	5-Apr-16	13-Jul-16	4-Apr-16	13-Jul-16	5-Apr-16	13-Jul-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16
Sample ID				AOI6-BH-16-035-2-4-SOIL	AOI6-BH-16-036-2-4-SOIL	AOI6-BH-16-043-2-4-SOIL	B-166_3'	B-167_4'	AOI6-B-172-2-4-SOIL	AOI6-B-172-2-4-071216	AOI6-B-173-2-4-SOIL	AOI6-B-173-2-4-071316	AOI6-B-174-2-4-SOIL	AOI6-B-174-2-4-071316	AOI6-B-175-2-4-SOIL	AOI6-B-175-2-4-071316	GP768-1-(3')-20160428	GP768-2-(3')-20160428	GP768-3-(3')-20160428	GP768-4-(2')-20160428	GP768-5-(2')-20160428	GP768-6-(2')-20160428
Sample Depth				2 - 2.25 ft	2 - 2.25 ft	2 - 2.5 ft	2.5 - 3 ft	3.5 - 4 ft	2.5 - 3 ft	2.5 - 3 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	2.7 - 3 ft	2.7 - 3 ft	3 ft	3 ft	3 ft	2 ft	2 ft	2 ft
Sampling Company				GHD	GHD	GHD	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1651423	1651423	1648963	JB23816	JB23816	1647893	1682991	1647893	1682991	1647893	1682991	1647893	1682991	1655907	1655907	1655907	1655907	1655907	1655907
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8336833	8336842	8325913	JB23816-4	JB23816-2	8321195	8475493	8321187	8475495	8321183	8475497	8321189	8475499	8358315	8358316	8358317	8358318	8358319	8358320
Volatile Organic Compounds																						
BENZENE	mg/kg	330[A]	0.5[B]	0.002 J (0.0005)	***0.700 J[B]*** (0.0005)	***1.300[B]*** (0.0005)	ND (0.0017) (0.00020)	0.136 (0.0071)	ND (0.410) (0.0005)	-	0.054 J (0.0005)	-	0.005 (0.0005)	-	0.210 J (0.0005)	-	0.0006 J (0.0005)	0.0008 J (0.0005)	0.001 J (0.0005)	ND (0.29) (0.0005)	0.005 (0.0005)	ND (0.0005) (0.0005)
CYCLOHEXANE	mg/kg	10000[A]	6900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.58) (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3[A]	0.005[B]	ND (0.004) (0.001)	*ND (4.200)* (0.001)	*ND (0.240)* (0.001)	ND (0.0017) (0.00021)	*ND (0.059)* (0.0075)	*ND (0.41)* (0.001)	-	*ND (0.330)* (0.001)	-	ND (0.005) (0.001)	-	*ND (0.340)* (0.001)	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98[A]	0.5[B]	ND (0.004) (0.001)	*ND (4.200)* (0.001)	ND (0.240) (0.001)	ND (0.0017) (0.00023)	ND (0.059) (0.0080)	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	ND (0.340) (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	*ND (0.58)* (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
ETHYLBENZENE	mg/kg	1000[A]	70[B]	ND (0.004) (0.001)	ND (4.200) (0.001)	0.130 J (0.001)	ND (0.0017) (0.00044)	0.309 (0.016)	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	0.230 J (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.72 J (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000[A]	2500[B]	0.083 (0.001)	180.000 (0.001)	0.230 J (0.001)	ND (0.0085) (0.00013)	7.21 (0.0044)	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	0.580 (0.001)	-	ND (0.0009) (0.001)	0.004 J (0.001)	0.001 J (0.001)	70 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
METHYL TERTIARY BUTYL ETHER	mg/kg	9900[A]	2[B]	ND (0.004) (0.0005)	*ND (4.200)* (0.0005)	ND (0.240) (0.0005)	ND (0.0017) (0.00040)	ND (0.059) (0.014)	ND (0.410) (0.0005)	-	ND (0.330) (0.0005)	-	ND (0.005) (0.0005)	-	ND (0.340) (0.0005)	-	ND (0.0004) (0.0005)	ND (0.0006) (0.0005)	ND (0.0005) (0.0005)	ND (0.29) (0.0005)	ND (0.0005) (0.0005)	ND (0.0005) (0.0005)
HEXANE	mg/kg	10000[A]	5600[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.58) (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
NAPHTHALENE	mg/kg	190000[A]	25[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	3.4 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000[A]	2800[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	1.8 J (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
BUTYLBENZENE, TERT-	mg/kg	10000[A]	2200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.58) (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
TOLUENE	mg/kg	10000[A]	100[B]	ND (0.004) (0.001)	ND (4.200) (0.001)	0.320 (0.001)	ND (0.0017) (0.00018)	0.163 (0.0062)	0.410 (0.001)	-	0.380 (0.001)	-	0.001 J (0.001)	-	0.500 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	0.001 J (0.001)	1.7 J (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
1,2,4-TRIMETHYLBENZENE	mg/kg	640[A]	35[B]	ND (0.004) (0.001)	ND (4.200) (0.001)	0.088 J (0.001)	ND (0.0085) (0.00035)	0.481 (0.012)	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	0.880 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	19 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000[A]	210[B]	ND (0.004) (0.001)	ND (4.200) (0.001)	0.081 J (0.001)	ND (0.0085) (0.00027)	0.155 J (0.0095)	ND (0.410) (0.001)	-	ND (0.330) (0.001)	-	ND (0.005) (0.001)	-	1.500 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	15 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100[A]	1000[B]	ND (0.004) (0.001)	ND (4.200) (0.001)	0.560 (0.001)	ND (0.0017) (0.00024)	1.30 (0.0083)	0.091 J (0.001)	-	0.074 J (0.001)	-	ND (0.005) (0.001)	-	2.200 (0.001)	-	ND (0.0009) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	16 (0.001)	ND (0.001) (0.001)	ND (0.0009) (0.001)
Volatile Organic Compounds (SW8011)																						
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3[A]	0.005[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.00021) (0.00020)	ND (0.00021) (0.00020)	ND (0.00023) (0.00020)	ND (0.00020) (0.00020)	ND (0.00023) (0.00020)	ND (0.00021) (0.00020)
Semi-Volatile Organic Compounds																						
ACENAPHTHENE	mg/kg	190000[A]	4700[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0034) (0.0033)	0.0056 J (0.0033)	0.0050 J (0.0033)	1.5 (0.0033)	ND (0.0038) (0.0033)	ND (0.0035) (0.0033)
ANTHRACENE	mg/kg	190000[A]	350[B]	0.004 J (0.003)	0.036 (0.003)	0.290 (0.003)	0.110 (0.015)	1.26 (0.013)	-	0.270 (0.003)	-	0.190 J (0.003)	-	0.140 J (0.003)	-	4.300 (0.003)	0.0059 J (0.0033)	0.021 (0.0033)	0.029 (0.0033)	0.90 (0.0033)	0.016 J (0.0033)	ND (0.0035) (0.0033)
BENZO(A)ANTHRACENE	mg/kg	190000[A]	430[B]	0.015 J (0.003)	0.086 (0.003)	0.900 (0.003)	0.0939 (0.014)	2.36 (0.012)	-	0.480 (0.003)	-	0.450 (0.003)	-	0.630 (0.003)	-	5.600 (0.003)	0.024 (0.0033)	0.073 (0.0033)	0.058 (0.0033)	0.41 (0.0033)	0.029 (0.0033)	0.016 J (0.0033)
BENZO(A)PYRENE	mg/kg	190000[A]	46[B]	0.02 (0.003)	0.088 (0.003)	1.500 (0.003)	0.0956 (0.013)	2.07 (0.011)	-	0.360 (0.003)	-	0.450 (0.003)	-	0.520 (0.003)	-	4.400 (0.003)	0.026 (0.0033)	0.12 (0.0033)	0.079 (0.0033)	0.33 (0.0033)	0.050 (0.0033)	0.021 (0.0033)
BENZO(B)FLUORANTHENE	mg/kg	190000[A]	170[B]	0.022 (0.003)	0.120 (0.003)	1.900 (0.003)	0.0998 (0.014)	2.42 (0.012)	-	0.500 (0.003)	-	0.630 (0.003)	-	0.650 (0.003)	-	7.700 (0.003)	0.037 (0.0033)	0.14 (0.0033)	0.15 (0.0033)	0.31 (0.0033)	0.062 (0.0033)	0.025 (0.0033)
BENZO(G,H,I)PERYLENE	mg/kg	190000[A]	180[B]	0.024 (0.003)	0.083 (0.003)	1.400 (0.003)	0.0802 (0.016)	1.26 (0.014)	-	0.230 (0.003)	-	0.470 (0.003)	-	0.400 (0.003)	-	3.300 (0.003)	0.024 (0.0033)	0.11 (0.0033)	0.12 (0.0033)	0.21 (0.0033)	0.059 (0.0033)	0.020 (0.0033)
BENZO(K)FLUORANTHENE	mg/kg	190000[A]	610[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	0.019 (0.0033)	0.056 (0.0033)	0.037 (0.0033)	0.083 J (0.0033)	0.021 (0.0033)	0.011 J (0.0033)
1,1'-BIPHENYL	mg/kg	190000[A]	190[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	1.0 (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000[A]	130[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
DI-N-BUTYL PHTHALATE	mg/kg	10000[A]	4900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
CHRYSENE	mg/kg	190000[A]	230[B]	0.020 (0.003)	0.100 (0.003)	1.100 (0.003)	0.113 (0.014)	2.25 (0.013)	-	0.510 (0.003)	-	0.650 (0.003)	-	0.670 (0.003)	-	5.600 (0.003)	0.026 (0.0033)	0.084 (0.0033)	0.067 (0.0033)	0.88 (0.0033)	0.033 (0.0033)	0.014 J (0.0033)
DIBENZ(A,H)ANTHRACENE	mg/kg	190000[A]	270[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0087 J (0.0033)	0.029 (0.0033)	0.034 (0.0033)	0.088 J (0.0033)	0.013 J (0.0033)	0.0074 J (0.0033)
DIETHYL PHTHALATE	mg/kg	10000[A]	9300[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
2,4-DIMETHYLPHENOL	mg/kg	10000[A]	230[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
2,4-DINITROPHENOL	mg/kg	190000[A]	23[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.31) (0.30)	ND (0.33) (0.30)	ND (0.36) (0.30)	ND (1.6) (0.30)	ND (0.34) (0.30)	ND (0.32) (0.30)
FLUORANTHENE	mg/kg	190000[A]	3200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	0.026 (0.0033)	0.086 (0.0033)	0.060 (0.0033)	0.39 (0.0033)	0.029 (0.0033)	0.013 J (0.0033)
FLUORENE	mg/kg	190000[A]	3800[B]	ND (0.019) (0.003)	0.010 J (0.003)	0.090 J (0.003)	0.126 (0.014)	0.865 (0.012)	-	0.110 (0.003)	-	0.160 J (0.003)	-	0.041 J (0.003)	-	8.400 (0.003)	ND (0.0034) (0.0033)	0.0056 J (0.0033)	0.0069 J (0.0033)	2.0 (0.0033)	0.0061 J (0.0033)	ND (0.0035) (0.0033)
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000[A]	22000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	0.020 (0.0033)	0.085 (0.0033)	0.097 (0.0033)	0.16 (0.0033)	0.043 (0.0033)	0.014 J (0.0033)
2-METHYLNAPHTHALENE	mg/kg	190000[A]	1900[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0049 J (0.0033)	0.022 (0.0033)	0.045 (0.0033)	13 (0.0033)	0.018 J (0.0033)	0.0046 J (0.0033)
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000[A]	580[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000[A]	58[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
NAPHTHALENE	mg/kg	190000[A]	25[B]	ND (0.019) (0.003)	0.018 J (0.003)	0.420 (0.003)	0.0250 J (0.011)	0.226 (0.010)	-	0.120 (0.003)	-	1.200 (0.003)	-	0.140 J (0.003)	-	3.900 (0.003)	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000[A]	6[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.17) (0.17)	ND (0.18) (0.17)	ND (0.20) (0.17)	ND (0.87) (0.17)	ND (0.19) (0.17)	ND (0.18) (0.17)
PHENANTHRENE	mg/kg	190000[A]	10000[B]	0.014 J (0.003)	0.077 (0.003)	0.580 (0.003)	0.314 (0.019)	5.20 (0.067)	-	0.790 (0.003)	-	0.880 (0.003)	-	0.530 (0.003)	-	22.000 (0.003)	0.0095 J (0.0033)	0.032 (0.0033)	0.049 (0.0033)	4.3 (0.0033)	0.020 (0.0033)	0.0060 J (0.0033)
PHENOL	mg/kg	18000[A]	200[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.017) (0.017)	ND (0.018) (0.017)	ND (0.020) (0.017)	ND (0.087) (0.017)	ND (0.019) (0.017)	ND (0.018) (0.017)
PYRENE	mg/kg	190000[A]	2200[B]	0.026 (0.003)	0.160 (0.003)	0.900 (0.003)	0.301 (0.016)	4.87 (0.057)	-	0.780 (0.003)	-	0.810 (0.003)	-	1.000 (0.003)	-	6.300 (0.003)	0.025 (0.0033)	0.10 (0.0033)	0.060 (0.0033)	1.4 (0.0033)	0.035 (0.0033)	0.015 J (0.0033)
PYRIDINE	mg/kg	10000[A]	12[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.069) (0.067)	ND (0.073) (0.067)	ND (0.081) (0.067)	ND (0.35) (0.067)	ND (0.077) (0.067)	ND (0.071) (0.067)
QUINOLINE	mg/kg	10000[A]	0.37[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.034) (0.033)	ND (0.037) (0.033)	ND (0.040) (0.033)	ND (0.17) (0.033)	ND (0.038) (0.033)	ND (0.036) (0.033)
Metals																						
COBALT	mg/kg	190000[A]	160[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	4.34 (0.0810)	6.41 (0.0810)	9.74 (0.0810)	4.11 (0.0810)	6.66 (0.0810)	3.67 (0.0810)
LEAD	mg/kg	190000[A]	450[B]	10.9 (0.510)	18.9 (0.510)	***1720[B]*** (0.510)	***1020[B]*** (0.16)	204 (0.13)	208 (0.510)	-	315 (0.510)	-	***1360[B]*** (0.510)	-	255 (0.510)	-	18.6 (0.510)	86.3 (0.510)	91.7 (0.510)	39.5 (0.510)	27.8 (0.510)	10.8 (0.510)
NICKEL	mg/kg	190000[A]	650[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	43.1 (0.300)	45.3 (0.300)	149 (0.300)	43.7 (0.300)	15.2 (0.300)	26.9 (0.300)
VANADIUM	mg/kg	190000[A]	820[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	149 (0.230)	214 (0.230)	321 (0.230)	169 (0.230)	144 (0.230)	34.6 (0.230)
ZINC	mg/kg	190000[A]	12000[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	62.5 (0.770)	134 (0.770)	157 (0.770)	307 (0.770)	60.0 (0.770)	25.2 (0.770)
General Chemistry																						
MOISTURE, PERCENT	%	n/v	n/v	9.4 (0.50)	8.0 (0.50)	9.3 (0.50)	-	-	42.4 (0.50)	16.7 (0.50)	34.3 (0.50)	14.4 (0.50)	24.2 (0.50)	15.1 (0.50)	37.5 (0.50)	29.6 (0.50)	4.0 (0.50)	9.2 (0.50)	18.1 (0.50)	4.1 (0.50)	13.0 (0.50)	7.3 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	8.84 (0.0100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	67.2 ()	85.8 ()	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table K.3

Historical Soil Analytical Results Summary - AOI 6 (>2 feet)
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016
[A]	Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Subsurface Soil (2-15 ft)
SHS-PA	Pennsylvania Department of Environmental Protection - Statewide Health Standards - 2016
[B]	PADEP Non-Residential Statewide Health Standards (>2 ft bgs) (Unsaturated Soil)
6.5 [A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
J	Indicates an estimated value.
mg/kg	milligrams per kilogram
ft	Feet
	Method detection limit is shown in second set of parentheses.

Appendix L
Indoor Air Sampling Information

2.

Indoor Air Sampling Field Data Sheet
(Form SP-28)

Carpenter Shop

A) General Information

Sample Identification Number: IA-A016-726.
Site Address: 3144 Passyunk Ave Phila PA
Sample Canister Location: A01-6 726 BUILDING

Sample Date: 3.29.16 Sampler: [illegible]
Sample Time: Start: 0737 Stop: 1539
Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 10475
Flow Controller Serial No.: 1014

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

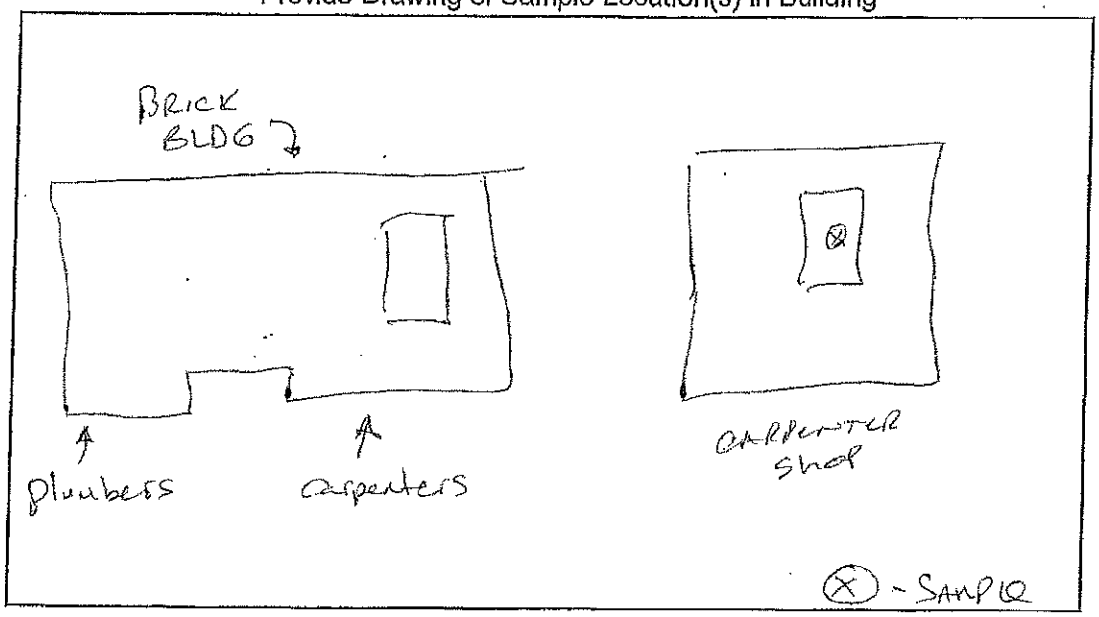
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	47	62		
Barometric Pressure	30.2		30.2	

	Start	Stop
Canister Pressure Gauge Reading:	-28	-5.5
Time:	0737	1539
PID Reading:	0.00 PPM	
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Sunny, cool, windy 15-30mph

Provide Drawing of Sample Location(s) in Building



C) Comments

CARPENTER SHOP

SET CAN ON CONFERENCE ROOM
TABLE CENTER OF LARGE OPEN AREA

3

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

Carpenter Shop Brick

Sample Identification Number: IA-A01-6-178.

Site Address: 3144 Passyunk Ave Phila PA

Sample Canister Location: A01-6 178 BUILDING

Sample Date: 3.29.16 Sampler: [signature]

Sample Time: Start: 0743 Stop: 1542

Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 15490

Flow Controller Serial No.: 1033

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

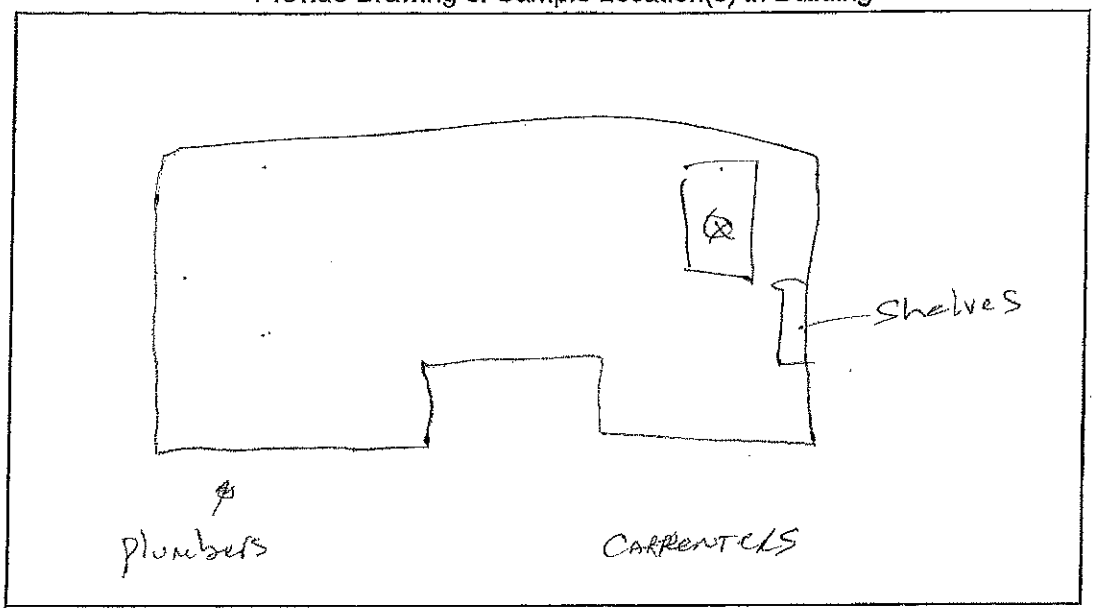
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	47	63		
Barometric Pressure	30.2		30.2	

	Start	Stop
Canister Pressure Gauge Reading:	-29+	~~1542~~ -6
Time:	0743	1542
PID Reading:	0.00 PPM	
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Sunny cool windy 15-30mph

Provide Drawing of Sample Location(s) in Building



C) Comments

CARPENTER TRADE SHOP

SET CAN ON LARGE TABLE

LOTS OF CHEMICALS IN SPRAY CANS
ON SHELVING

4/

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

Sample Identification Number: IA-A016-OUTDOOR-032916
Site Address: 3144 Passyunk Ave Phila PA
Sample Canister Location: A01-6 ~~BUILDING~~ Ambient outdoor

Near carpenter shop open area

Sample Date: 3.29.16 Sampler: [illegible]
Sample Time: Start: 0750 Stop: 1545
Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: C10161
Flow Controller Serial No.: 1001

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

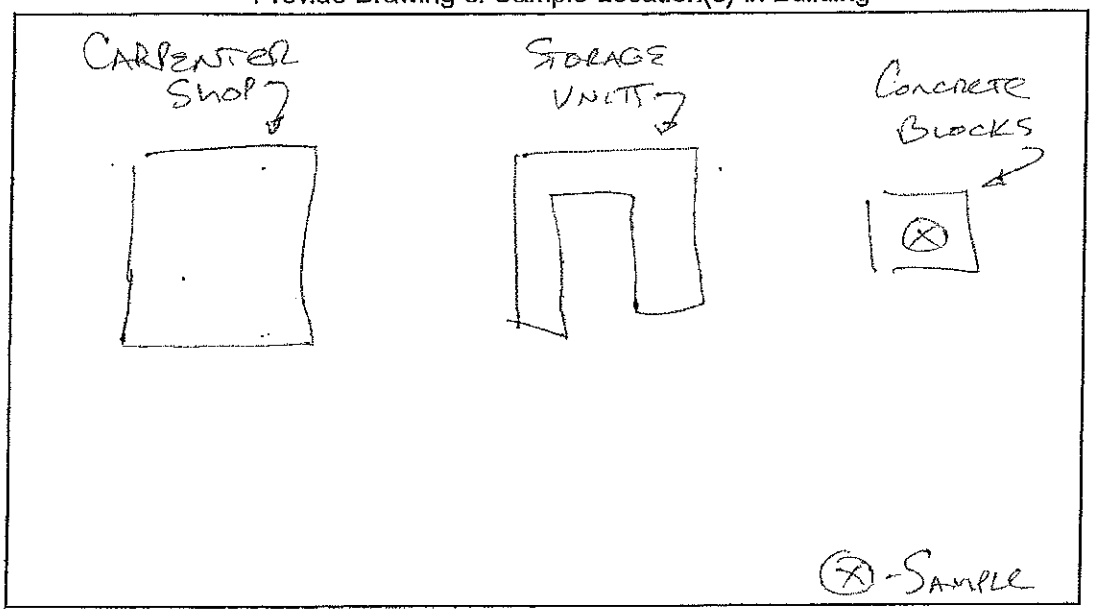
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	47	63	—	—
Barometric Pressure	30.20		30.21	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-6
Time:	0750	1545
PID Reading:	0.00 ppm	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Sunny cold windy 15-30 mph

Provide Drawing of Sample Location(s) in Building



C) Comments

OUTDOOR AMBIENT AOI-6

NEAR CARPENTER SHOP (726)

Close to PLATT BLDGE

5

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

Sample Identification Number: IA-A016-295-1.

Site Address: 3144 Passyunk Ave Phila PA

Sample Canister Location: A01-6 295 BUILDING 1st flr

Sample Date: 3.29.16 Sampler: [illegible]

Sample Time: Start: 0802 Stop: 1554

Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 19743 / 2179

Flow Controller Serial No.: 102

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

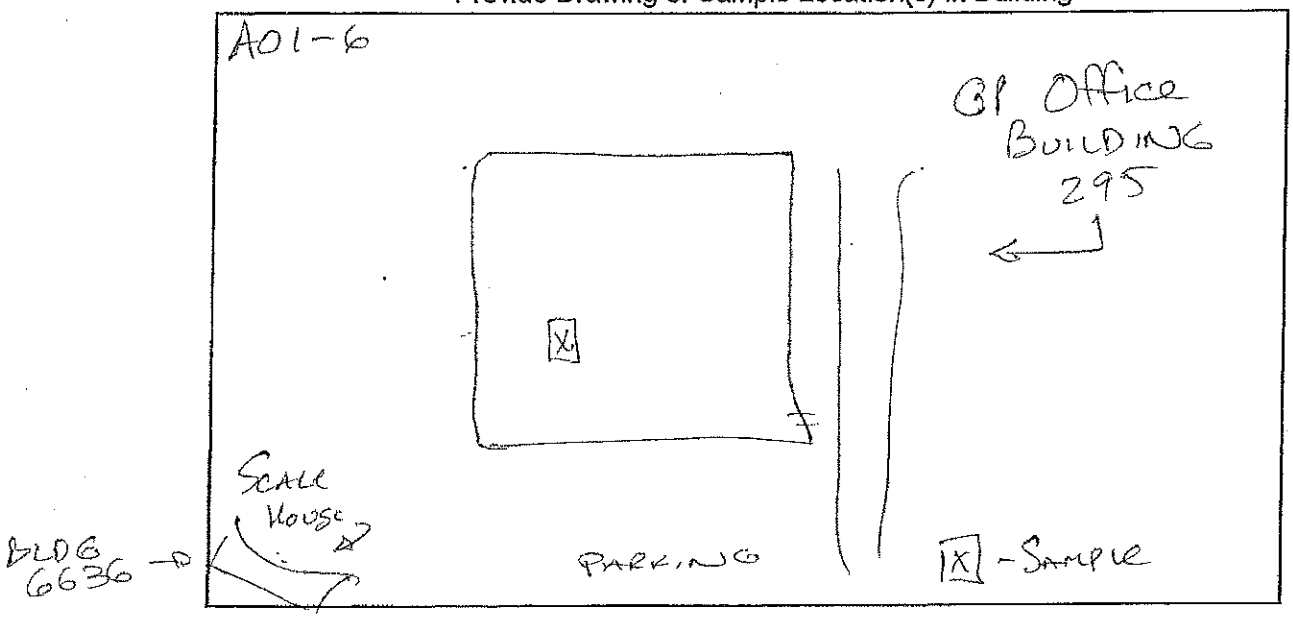
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	47	64	—	76
Barometric Pressure	30.2		30.26	

	Start	Stop
Canister Pressure Gauge Reading:	-29.	-4
Time:	0802	1554
PID Reading:	0.00 ppm	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Sunny cold windy 15-30mph

Provide Drawing of Sample Location(s) in Building



C) Comments

GP office Bldg 295
2 floors
SAMPLE LOCATION SHOWN IS APPROXIMATE
location of both floors

6.

Indoor Air Sampling Field Data Sheet
(Form SP-28)

Office Bldg

A) General Information

Sample Identification Number: IA-A016-295-2
Site Address: 3144 Passyunk Ave Phila PA
Sample Canister Location: A01-6 295 BUILDING 2ND FLR

Sample Date: 3.29.16 Sampler: [illegible]
Sample Time: Start: 0807 Stop: 1556
Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 19921
Flow Controller Serial No.: 396

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	47	66	—	75
Barometric Pressure	30.20		30.19	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-7
Time:	0802	1556
PID Reading:	0.00 PPM	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Sunny cold windy 15-30 mph

Provide Drawing of Sample Location(s) in Building

C) Comments

See A016-285-1

11

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

-A016-

Sample Identification Number: IA-~~A012~~-475

Site Address: 3144 Passyunk Ave Phila PA

Sample Canister Location: A01-6 475 BUILDING

Sample Date: 3.28.16 Sampler: [illegible]

Sample Time: Start: 1023 Stop: 1823

Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1362

Flow Controller Serial No.: 809827

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	~50	68	~60	71
Barometric Pressure	29.8		29.8	

	Start	Stop
Canister Pressure Gauge Reading:	-30	+10+
Time:	1023	1823
PID Reading:	0.00 ppm	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Cool, light rain, breezy

12.

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

WTP

Sample Identification Number: IA-A016-745.
Site Address: 3144 Passyunk Ave Phila PA
Sample Canister Location: A01-6706 745 BUILDING

Sample Date: 3.28.16 Sampler: [illegible]
Sample Time: Start: 1033 Stop: 1800
Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1363
Flow Controller Serial No.: 824836

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	~50	69	~60	74
Barometric Pressure	29.8		29.8	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-9.5
Time:	1033	1800
PID Reading:	0.00 ppM	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
cool, lt rain, breezy
partly sunny,

13.

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

Sample Identification Number: IA-A01-6-6627. Control Room

Site Address: 3144 Passyunk Ave Phila PA

Sample Canister Location: A01-6 6627 Building

Sample Date: 3.28.16 Sampler: [illegible]

Sample Time: Start: 1042 Stop: 1808

Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1361

Flow Controller Serial No.: 303421

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	~50	65	~60	72
Barometric Pressure	29.8		29.8	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-8
Time:	1042	1808
PID Reading:	0.08 ppm	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
cool, lt rain, breezy
p. sunny, cool, windy

14.

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

TRUCK SCALE HOUSE

Sample Identification Number: IA-A016-6636
Site Address: 3144 Passyunk Ave Phila PA
Sample Canister Location: A01-6 6636 BUILDING

Sample Date: 3.28.16 Sampler: [illegible]
Sample Time: Start: 1057 Stop: 1818
Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1384
Flow Controller Serial No.: ~~1632~~ 342379

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	~50	64	~60	70
Barometric Pressure	29.8		29.8	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-2
Time:	1057	1818
PID Reading:	0.00 PPM	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
cool, light rain, lt breeze

15

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

Sample Identification Number: IA-A016-739 Control Room

Site Address: 3144 Passyunk Ave Phila PA

Sample Canister Location: A01-6 739 Building

Sample Date: 3.28.16 Sampler: [illegible]

Sample Time: Start: 1110 Stop: 1833

Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1382

Flow Controller Serial No.: 710628

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	~40	66	~60	67
Barometric Pressure	29.8		29.8	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-8.5
Time:	1110	1833
PID Reading:	0.00 ppm	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
cool, breezy

~~15~~ 10

Indoor Air Sampling Field Data Sheet
(Form SP-28)

A) General Information

Sample Identification Number: IA-A016 - ~~295.1b~~ OUTDOOR 739

Site Address: 3144 Passyunk Ave Phila PA

Sample Canister Location: A01-6 ~~295 BUILDING~~ OUTDOOR

Sample Date: 3.28.16 Sampler: [illegible]

Sample Time: Start: 1115 Stop:

Shipping Date: 3.21.16

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1383

Flow Controller Serial No.: 824856

Were "Instructions to Occupants Building" followed?
☐ Yes ☐ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	50	—	—	
Barometric Pressure	29.8		29.8	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-23
Time:	1115	1829
PID Reading:	0.00 ppm	0.00
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions:
Cool ~~light mist~~ / breeze

Outdoor
~~Indoor~~ Air Sampling Field Data Sheet
(Form SP-28)

Evergreen PES 1110963

A) General Information

Sample Identification Number: ~~AA-AOI6~~ AE ~~AOI6~~-AA16-001

Site Address: 3000 Penrose Ave, Philadelphia, PA

Sample Canister Location: Near well 136 and Sump 1

Sample Date: 8/25/16 Sampler: A. Cannon

Sample Time: Start: 0714 Stop: 1621

Shipping Date:

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1023

Flow Controller Serial No.: 303423

Were "Instructions to Occupants Building" followed? Outdoor Air
☐ Yes ☐ No

B) Sampling Information

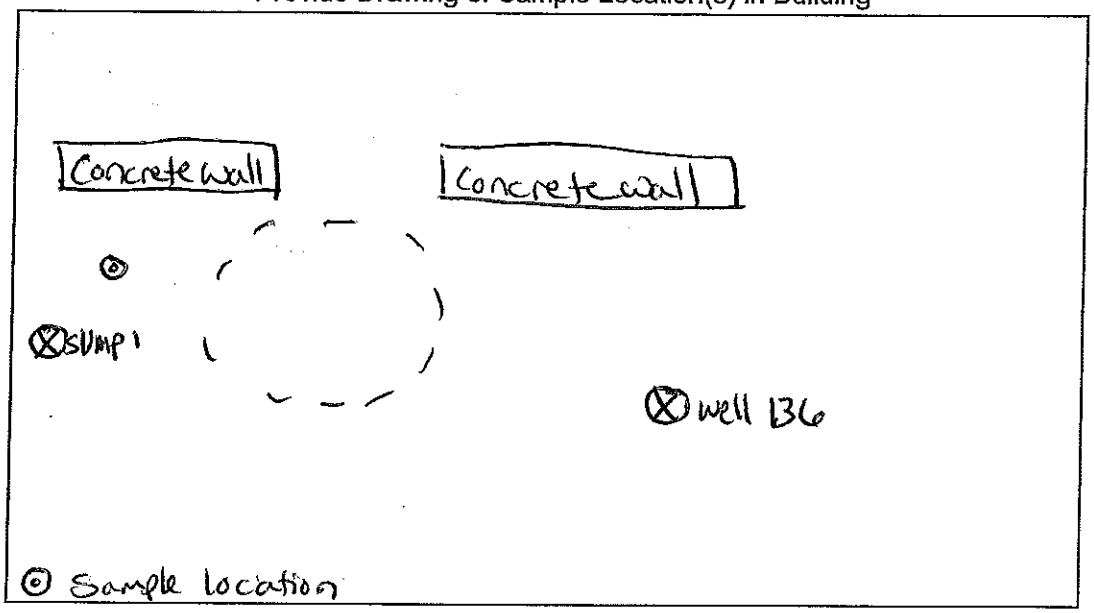
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	69°	—	85°	—
Barometric Pressure	30.14		30.04	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-03
Time:	0714	1621
PID Reading:	0.0	0.0
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☒ No

Describe the general weather conditions: Sunny 69°, 5mph breeze

Provide Drawing of Sample Location(s) in Building



C) Comments

PID=0.0, low traffic area, weather is calm, hoses laying in area.

AL
~~Indoor~~ Air Sampling Field Data Sheet
Outdoor
(Form SP-28)

Evergreen PES 1109613

A) General Information

Sample Identification Number: A0J6-AA16-002
Site Address: 3000 Pennrose Ave Phil PA
Sample Canister Location: Near well B-175

Sample Date: 8/25/16 Sampler: Alissa Cannon
Sample Time: Start: 0733 Stop: 1632
Shipping Date:

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1118
Flow Controller Serial No.: 930

Were "Instructions to Occupants Building" followed? Outdoor Air
☐ Yes ☐ No

B) Sampling Information

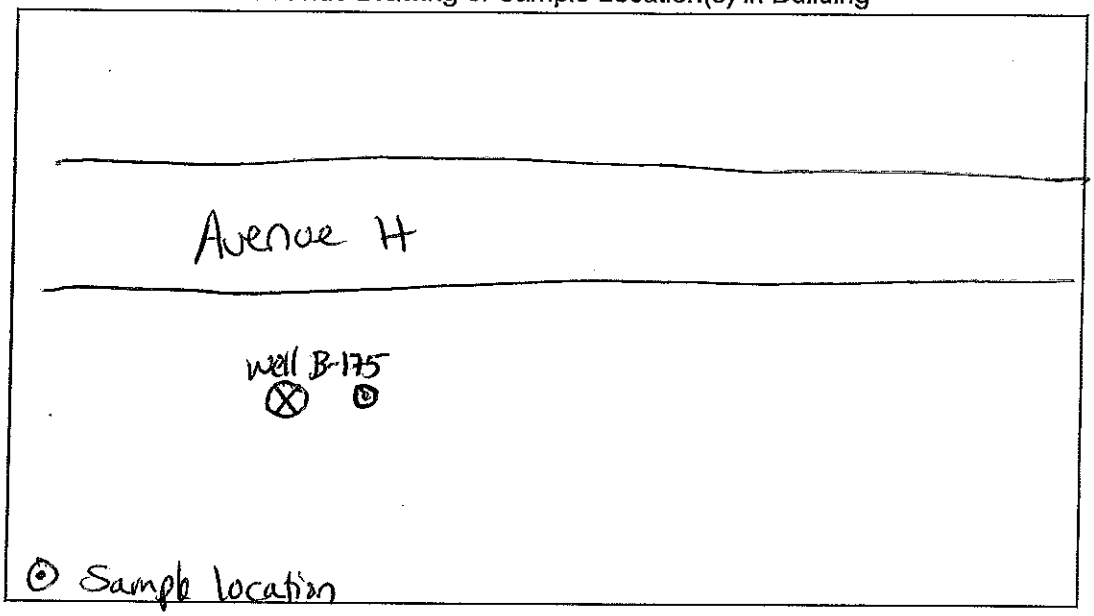
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	69°		85°	
Barometric Pressure	30.15		30.04	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-05
Time:	0733	1632
PID Reading:	0.0	0.0
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☒ No

Describe the general weather conditions: Sunny 5mph Breeze

Provide Drawing of Sample Location(s) in Building



C) Comments

located in old tank field. Cement pads near by gravel mounds

Ac
Indoor Air Sampling Field Data Sheet
Outdoor
(Form SP-28)

Evergreen PED 11109613

A) General Information

Sample Identification Number: AOI6- AA16-003
Site Address: 3000 Pennsylvania Ave. Philadelphia, PA
Sample Canister Location: near well B-39

Sample Date: 08/25/16 Sampler: Alissa Cannon
Sample Time: Start: 0747 Stop: 1641
Shipping Date:

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 1202
Flow Controller Serial No.: 399408

Were "Instructions to Occupants Building" followed? Outdoor Air
☐ Yes ☐ No

B) Sampling Information

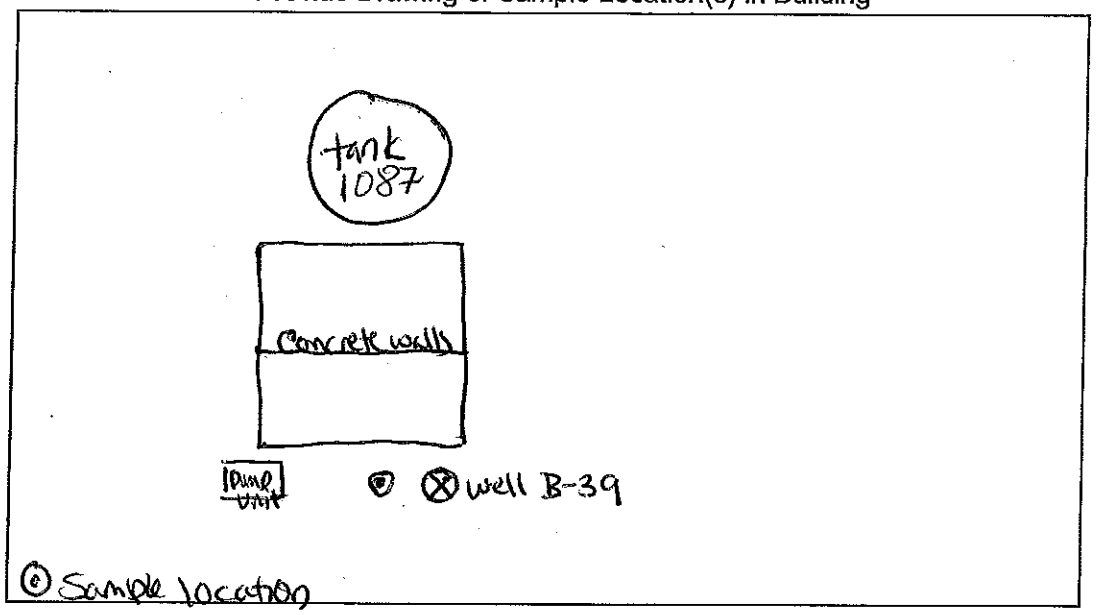
	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	71°	—	85°	—
Barometric Pressure	30.14		30.03	

	Start	Stop
Canister Pressure Gauge Reading:	-30	-04+
Time:	0747	1641
PID Reading:	0.0	0.0
Basement Depth (ft below grade):	—	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
☐ Yes ☐ No

Describe the general weather conditions: Sunny, slight breeze

Provide Drawing of Sample Location(s) in Building



C) Comments

Slight breeze. low to mild traffic area. Old metal pipes nearby. Pump unit, open unit, on side of sample location. Gravel area

Appendix M
Potable Well Search

N
W E
S

Legend

Water Use

- Unknown
- Dewater
- Domestic
- Industrial
- Other
- Public Supply
- Unused
- 1 Mile Buffer of Site
- AOI Boundary

Notes:
1. World aerial imagery basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online. Source of aerial imagery is USDA FSA from 8/16/2015. Credits: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community.
2. Well search results provided by PaGWIS, November 2016.

Figure X: 2016 One Mile Radius Well Search
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 1,200 2,400 Feet

SCALE: 1" = 1200'
DATE: 11/22/2016
DRN. BY: AJC
CKD. BY: DW
JOB#: 257460I

Path: \\Langan.com\data\DYL\data6\257460I\ArcGIS\MapDocuments\AOI 11 SCR\Appendix\Figure X - Well Search_113016.mxd

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
0	644106	64410639.89804-75.21938	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/27/2016	NEW WELL	39.89804	-75.21938
1	644106	64410639.89804-75.21938	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/27/2016	NEW WELL	39.89804	-75.21938
2	644105	64410539.89573-75.22036	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/21/2016	NEW WELL	39.89573	-75.22036
3	644105	64410539.89573-75.22036	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/21/2016	NEW WELL	39.89573	-75.22036
4	644104	64410439.89757-75.2196	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/14/2016	NEW WELL	39.89757	-75.2196
5	644104	64410439.89757-75.2196	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/14/2016	NEW WELL	39.89757	-75.2196
6	644103	64410339.89945-75.22197	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/15/2016	NEW WELL	39.89945	-75.22197
7	644103	64410339.89945-75.22197	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/15/2016	NEW WELL	39.89945	-75.22197
8	644102	64410239.90225-75.22167	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/20/2016	NEW WELL	39.90225	-75.22167
9	644102	64410239.90225-75.22167	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/20/2016	NEW WELL	39.90225	-75.22167
10	644090	64409039.8942-75.22347	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/6/2016	NEW WELL	39.8942	-75.22347
11	644090	64409039.8942-75.22347	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/6/2016	NEW WELL	39.8942	-75.22347
12	644089	64408939.89582-75.21969	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/22/2016	NEW WELL	39.89582	-75.21969
13	644089	64408939.89582-75.21969	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/22/2016	NEW WELL	39.89582	-75.21969
14	644032	64403239.89823-75.22238	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/19/2016	NEW WELL	39.89823	-75.22238
15	644032	64403239.89823-75.22238	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/19/2016	NEW WELL	39.89823	-75.22238
16	644031	64403139.90035-75.2238	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/6/2016	NEW WELL	39.90035	-75.2238
17	644031	64403139.90035-75.2238	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	9/6/2016	NEW WELL	39.90035	-75.2238
18	643672	64367239.9232-75.1939	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	Porter Station 28th Street	19145	9/13/2016	NEW WELL	39.9232	-75.1939
19	643638	64363839.92181-75.19477	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	Walter Street	19145	9/12/2016	NEW WELL	39.92181	-75.19477
20	643617	64361739.92252-75.19415	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	W. Porter Street	19145	9/12/2016	NEW WELL	39.92252	-75.19415
21	643401	64340139.92517-75.20346	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/25/2016	NEW WELL	39.92517	-75.20346
22	643401	64340139.92517-75.20346	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/25/2016	NEW WELL	39.92517	-75.20346
23	643400	64340039.92419-75.19915	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/23/2016	NEW WELL	39.92419	-75.19915
24	643400	64340039.92419-75.19915	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/23/2016	NEW WELL	39.92419	-75.19915
25	643399	64339939.9217-75.20739	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/17/2016	NEW WELL	39.9217	-75.20739
26	643399	64339939.9217-75.20739	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/17/2016	NEW WELL	39.9217	-75.20739
27	642905	64290539.92402-75.20774	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/8/2016	NEW WELL	39.92402	-75.20774
28	642905	64290539.92402-75.20774	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/8/2016	NEW WELL	39.92402	-75.20774
29	642893	64289339.92394-75.20592	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/9/2016	NEW WELL	39.92394	-75.20592
30	642893	64289339.92394-75.20592	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/9/2016	NEW WELL	39.92394	-75.20592
31	642823	64282339.92429-75.20617	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/9/2016	NEW WELL	39.92429	-75.20617
32	642823	64282339.92429-75.20617	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/9/2016	NEW WELL	39.92429	-75.20617
33	642822	64282239.92395-75.2059	Point	PHILADELPHIA	PHILADELPHIA				8/4/2016	NEW WELL	39.92395	-75.2059
34	642822	64282239.92395-75.2059	Point	PHILADELPHIA	PHILADELPHIA				8/4/2016	NEW WELL	39.92395	-75.2059
35	642821	64282139.92521-75.20528	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/4/2016	NEW WELL	39.92521	-75.20528
36	642821	64282139.92521-75.20528	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/4/2016	NEW WELL	39.92521	-75.20528
37	642820	64282039.9235-75.2056	Point	PHILADELPHIA	PHILADELPHIA				8/5/2016	NEW WELL	39.9235	-75.2056
38	642820	64282039.9235-75.2056	Point	PHILADELPHIA	PHILADELPHIA				8/5/2016	NEW WELL	39.9235	-75.2056
39	642820	64282039.9235-75.2056	Point	PHILADELPHIA	PHILADELPHIA				8/5/2016	NEW WELL	39.9235	-75.2056
40	641639	64163939.91634-75.18079	Point	PHILADELPHIA	PHILADELPHIA		20th & Johnston Sts	19145	4/8/2015	NEW WELL	39.91634	-75.18079
41	641638	64163839.91644-75.17987	Point	PHILADELPHIA	PHILADELPHIA		20th and Johnston Sts	19145	4/8/2015	NEW WELL	39.91644	-75.17987
42	641637	64163739.91415-75.18027	Point	PHILADELPHIA	PHILADELPHIA		20th and Johnston Sts	19145	4/8/2015	NEW WELL	39.91415	-75.18027
43	641636	64163639.91422-75.18151	Point	PHILADELPHIA	PHILADELPHIA		20th and Johnston Sts	19145	4/8/2015	NEW WELL	39.91422	-75.18151
44	641622	64162239.90231-75.20244	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90231	-75.20244
45	641620	64162039.90267-75.20254	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90267	-75.20254
46	641619	64161939.90257-75.20232	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90257	-75.20232
47	641618	64161839.90257-75.20232	Point	PHILADELPHIA	PHILADELPHIA		6301 Pssyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90257	-75.20232
48	641617	64161739.90256-75.20252	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90256	-75.20252
49	641616	64161639.9022-75.20266	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.9022	-75.20266
50	641615	64161539.90024-75.20027	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.20027
51	641613	64161339.91571-75.21602	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.91571	-75.21602
52	641612	64161239.90024-75.21668	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.21668
53	641611	64161139.90024-75.21667	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.21667
54	641610	64161039.90023-75.21667	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90023	-75.21667
55	641609	64160939.9002-75.20027	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.9002	-75.20027
56	641608	64160839.90021-75.20027	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90021	-75.20027
57	641555	64155539.90244-75.2024	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90244	-75.2024
58	641554	64155439.90243-75.21672	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90243	-75.21672
59	641553	64155339.90239-75.20001	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90239	-75.20001
60	641552	64155239.90267-75.2026	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90267	-75.2026
61	641551	64155139.90267-75.20259	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90267	-75.20259
62	641550	64155039.90227-75.20244	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90227	-75.20244

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
63	641549	64154939.90024-75.20025	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.20025
64	641548	64154839.90024-75.20026	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.20026
65	641547	64154739.90024-75.20027	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.20027
66	641546	64154639.90024-75.20027	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.20027
67	641545	64154539.90024-75.20028	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90024	-75.20028
68	641544	64154439.90023-75.21667	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90023	-75.21667
69	641543	64154339.90022-75.21667	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90022	-75.21667
70	641542	64154239.90021-75.21668	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90021	-75.21668
71	641541	64154139.9002-75.21667	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.9002	-75.21667
72	640524	64052439.90242-75.21676	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90242	-75.21676
73	640523	64052339.90252-75.2167	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90252	-75.2167
74	640522	64052239.90245-75.21676	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90245	-75.21676
75	640467	64046739.90262-75.20273	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.90262	-75.20273
76	640444	64044439.90918-75.19379	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3450 S 26th St	19145	2/8/2016	NEW WELL	39.90918	-75.19379
77	640444	64044439.90918-75.19379	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3450 S 26th St	19145	2/8/2016	NEW WELL	39.90918	-75.19379
78	640444	64044439.90918-75.19379	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3450 S 26th St	19145	2/8/2016	NEW WELL	39.90918	-75.19379
79	640074	64007439.90912-75.19723	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	2/24/2016	NEW WELL	39.90912	-75.19723
80	640074	64007439.90912-75.19723	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	2/24/2016	NEW WELL	39.90912	-75.19723
81	640074	64007439.90912-75.19723	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA		Not F	2/24/2016	NEW WELL	39.90912	-75.19723
82	638317	63831739.91321-75.21703	Point	PHILADELPHIA	PHILADELPHIA		6301 Passyunk Ave	19153	12/18/2014	WELL ABANDONMENT	39.91321	-75.21703
83	637492	63749239.91594-75.17836	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	1800 Bigler Street	19145	2/3/2016	CLOSED-LOOP GEOTHERMAL	39.91594	-75.17836
84	636003	63600339.90778-75.20278	Point	PHILADELPHIA	PHILADELPHIA		2601 PENROSE AVE.		2/6/2003	NEW WELL	39.90778	-75.20278
85	636002	63600239.90778-75.20278	Point	PHILADELPHIA	PHILADELPHIA		2601 PENROSE AVE.		2/6/2003	NEW WELL	39.90778	-75.20278
86	635716	63571639.90778-75.20278	Point	PHILADELPHIA	PHILADELPHIA		2601 PENROSE AVE.		2/6/2003	NEW WELL	39.90778	-75.20278
87	632596	63259639.90259-75.23553	Point	PHILADELPHIA	PHILADELPHIA		7625 Suffolk Ave	19153	11/24/2015	NEW WELL	39.90259	-75.23553
88	632569	63256939.90193-75.23588	Point	PHILADELPHIA	PHILADELPHIA		7625 Suffolk Ave	19173	11/24/2015	NEW WELL	39.90193	-75.23588
89	632568	63256839.90214-75.23757	Point	PHILADELPHIA	PHILADELPHIA		7625 Suffolk Ave	19153	11/24/2015	NEW WELL	39.90214	-75.23757
90	631015	63101539.91417-75.1775	Point	PHILADELPHIA	PHILADELPHIA		6201 N. BROAD STREET	19145	5/4/2005	NEW WELL	39.91417	-75.1775
91	631014	63101439.91417-75.1775	Point	PHILADELPHIA	PHILADELPHIA		6201 N. BROAD STREET	19145	5/4/2005	NEW WELL	39.91417	-75.1775
92	625489	62548939.92222-75.22473	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22473
93	625488	62548839.92222-75.22472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22472
94	625480	62548039.92222-75.22471	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22471
95	625165	62516539.92222-75.22472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22472
96	625164	62516439.92222-75.22472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22472
97	625163	62516339.92222-75.22471	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22471
98	625162	62516239.92222-75.22472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6700 ESSINGTON AVE.	19153	11/3/2006	NEW WELL	39.92222	-75.22472
99	623945	62394539.90455-75.22322	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	1708 Mingo Avenue	19153	7/27/2015	NEW WELL	39.90455	-75.22322
100	623780	62378039.91948-75.19126	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3144 Passyunk Avenue	19145	3/3/2015	NEW WELL	39.91948	-75.19126
101	623779	62377939.91906-75.19562	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3144 Passyunk Avenue	Not F	2/20/2015	NEW WELL	39.91906	-75.19562
102	623634	62363439.90186-75.22443	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	1708 Mingo Avenue	19153	6/23/2015	NEW WELL	39.90186	-75.22443
103	623612	62361239.89961-75.22514	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	1708 Mingo Avenue	19153	6/15/2015	NEW WELL	39.89961	-75.22514
104	623611	62361139.89669-75.22565	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	1708 Mingo Avenue	Not F	6/19/2015	NEW WELL	39.89669	-75.22565
105	623589	62358939.899-75.22534	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	1708 Mingo Avenue	19153	6/12/2015	NEW WELL	39.899	-75.22534
106	623479	62347939.91974-75.19122	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3144 Passyunk Avenue	19145	2/26/2015	NEW WELL	39.91974	-75.19122
107	623478	62347839.91957-75.19125	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3144 Passyunk Avenue	19145	2/27/2015	NEW WELL	39.91957	-75.19125
108	623377	62337739.93959-75.19896	Point	PHILADELPHIA	PHILADELPHIA		1201 S 35th St		8/13/2015	NEW WELL	39.93959	-75.19896
109	623376	62337639.93922-75.19968	Point	PHILADELPHIA	PHILADELPHIA		1201 S 35th st		8/13/2015	NEW WELL	39.93922	-75.19968
110	623375	62337539.93968-75.19963	Point	PHILADELPHIA	PHILADELPHIA		1201 S 35th St		8/13/2015	NEW WELL	39.93968	-75.19963
111	623333	62333339.93889-75.19966	Point	PHILADELPHIA	PHILADELPHIA		1201 S 35th St		8/13/2015	NEW WELL	39.93889	-75.19966
112	623332	62333239.93865-75.20003	Point	PHILADELPHIA	PHILADELPHIA		1201 S 35th St		8/13/2015	NEW WELL	39.93865	-75.20003
113	621612	62161239.90278-75.23056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	7001 ESSINGTON AVE.	19153	2/28/2008	NEW WELL	39.90278	-75.23056
114	621611	62161139.90278-75.23056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	7001 ESSINGTON AVE.	19153	2/28/2008	NEW WELL	39.90278	-75.23056
115	621610	62161039.90278-75.23056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	7001 ESSINGTON AVE.	19153	2/28/2008	NEW WELL	39.90278	-75.23056
116	621609	62160939.90278-75.23056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	7001 ESSINGTON AVE.	19153	2/28/2008	NEW WELL	39.90278	-75.23056
117	621226	62122639.90278-75.23057	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	7001 ESSINGTON AVE.	19153	2/28/2008	NEW WELL	39.90278	-75.23057
118	620351	62035139.9232-75.19409	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/15/2015	NEW WELL	39.9232	-75.19409
119	620350	62035039.92268-75.19418	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2818 W Porter St	19145	6/18/2015	NEW WELL	39.92268	-75.19418
120	620349	62034939.92257-75.19422	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2818 W Porter St	19145	6/22/2015	NEW WELL	39.92257	-75.19422
121	620348	62034839.92336-75.19393	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/29/2015	NEW WELL	39.92336	-75.19393
122	620342	62034239.92171-75.19509	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/16/2015	NEW WELL	39.92171	-75.19509
123	620328	62032839.92193-75.19496	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/22/2015	NEW WELL	39.92193	-75.19496
124	620327	62032739.92257-75.19477	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/30/2015	NEW WELL	39.92257	-75.19477
125	620301	62030139.92265-75.1946	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/26/2015	NEW WELL	39.92265	-75.1946

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
126	620300	62030039.92242-75.19491	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/30/2015	NEW WELL	39.92242	-75.19491
127	620294	62029439.9226-75.19474	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/30/2015	NEW WELL	39.9226	-75.19474
128	620293	62029339.92258-75.19419	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2818 W Porter St	19145	6/22/2015	NEW WELL	39.92258	-75.19419
129	620292	62029239.92259-75.19439	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/25/2015	NEW WELL	39.92259	-75.19439
130	620291	62029139.92258-75.19427	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2818 W Porter St	19145	6/25/2015	NEW WELL	39.92258	-75.19427
131	620278	62027839.92219-75.19492	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/25/2015	NEW WELL	39.92219	-75.19492
132	620277	62027739.92199-75.19494	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/22/2015	NEW WELL	39.92199	-75.19494
133	620090	62009039.92262-75.19458	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/29/2015	NEW WELL	39.92262	-75.19458
134	620080	62008039.92271-75.19409	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2814 W Porter St	19145	6/16/2015	NEW WELL	39.92271	-75.19409
135	620079	62007939.92274-75.1941	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2814 W Porter St	19145	6/17/2015	NEW WELL	39.92274	-75.1941
136	620078	62007839.92154-75.19506	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2511 S Newkirk St	19145	6/17/2015	NEW WELL	39.92154	-75.19506
137	620071	62007139.92262-75.19447	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/26/2015	NEW WELL	39.92262	-75.19447
138	620070	62007039.92333-75.19389	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/10/2015	NEW WELL	39.92333	-75.19389
139	620069	62006939.92336-75.19383	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/10/2015	NEW WELL	39.92336	-75.19383
140	620068	62006839.92297-75.19414	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2818 W Porter St	19145	6/12/2015	NEW WELL	39.92297	-75.19414
141	620064	62006439.92169-75.19503	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/19/2015	NEW WELL	39.92169	-75.19503
142	620059	62005939.92227-75.19492	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/26/2015	NEW WELL	39.92227	-75.19492
143	620057	62005739.92217-75.19492	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/26/2015	NEW WELL	39.92217	-75.19492
144	620056	62005639.92175-75.195	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/19/2015	NEW WELL	39.92175	-75.195
145	620055	62005539.9216-75.19504	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/18/2015	NEW WELL	39.9216	-75.19504
146	620051	62005139.92266-75.19467	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/30/2015	NEW WELL	39.92266	-75.19467
147	620050	62005039.9219-75.19499	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/23/2015	NEW WELL	39.9219	-75.19499
148	620048	62004839.92216-75.19493	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/24/2015	NEW WELL	39.92216	-75.19493
149	620038	62003839.92197-75.19494	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/23/2015	NEW WELL	39.92197	-75.19494
150	620003	62000339.92225-75.19493	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/25/2015	NEW WELL	39.92225	-75.19493
151	620002	62000239.92203-75.19494	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/24/2015	NEW WELL	39.92203	-75.19494
152	619980	61998039.92146-75.19508	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2519 S Newkirk St	19145	6/16/2015	NEW WELL	39.92146	-75.19508
153	619979	61997939.92138-75.1951	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2521 S Newkirk St	19145	6/15/2015	NEW WELL	39.92138	-75.1951
154	619975	61997539.92321-75.19385	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/11/2015	NEW WELL	39.92321	-75.19385
155	619974	61997439.92314-75.19405	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/11/2015	NEW WELL	39.92314	-75.19405
156	619973	61997339.92304-75.19408	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/17/2015	NEW WELL	39.92304	-75.19408
157	619972	61997239.92298-75.19397	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2401 S 28th St	19145	6/12/2015	NEW WELL	39.92298	-75.19397
158	619971	61997139.92279-75.19445	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/16/2015	NEW WELL	39.92279	-75.19445
159	619970	61997039.92263-75.19419	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2818 W Porter St	19145	6/17/2015	NEW WELL	39.92263	-75.19419
160	619969	61996939.92258-75.1943	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2820 W Porter St	19145	6/18/2015	NEW WELL	39.92258	-75.1943
161	619968	61996839.92255-75.19433	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2820 W Porter St	19145	6/23/2015	NEW WELL	39.92255	-75.19433
162	619967	61996739.92257-75.1944	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/23/2015	NEW WELL	39.92257	-75.1944
163	619960	61996039.92187-75.19497	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2830 Ernest St	19145	6/22/2015	NEW WELL	39.92187	-75.19497
164	619959	61995939.92249-75.19487	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/29/2015	NEW WELL	39.92249	-75.19487
165	619958	61995839.92231-75.1949	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2822 W Porter St	19145	6/29/2015	NEW WELL	39.92231	-75.1949
166	618285	61828539.89972-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20306
167	618284	61828439.89972-75.20305	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20305
168	618283	61828339.89973-75.20305	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89973	-75.20305
169	618282	61828239.89972-75.20307	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20307
170	618281	61828139.89972-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20306
171	618280	61828039.89973-75.20307	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89973	-75.20307
172	617003	61700339.89972-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20306
173	617002	61700239.89972-75.20307	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20307
174	617001	61700139.89971-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89971	-75.20306
175	617000	61700039.89972-75.20307	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20307
176	616999	61699939.89972-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20306
177	616998	61699839.89972-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89972	-75.20306
178	616914	61691439.89971-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA NAVAL BASE	19145	6/25/2008	WELL ABANDONMENT	39.89971	-75.20306
179	596905	59690539.90588-75.19399	Point	PHILADELPHIA	PHILADELPHIA		2601 PENROSE AVE.	19145	10/15/2012	NEW WELL	39.90588	-75.19399
180	596661	59666139.91899-75.19127	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3112 S 26th St	19145	1/12/2015	OTHER	39.91899	-75.19127
181	596660	59666039.91887-75.1913	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3118 S 26th St	19145	1/13/2015	OTHER	39.91887	-75.1913
182	596204	59620439.91751-75.1931	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/9/2014	NEW WELL	39.91751	-75.1931
183	594712	59471239.9192-75.19123	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3102 S 26th St	19145	1/9/2015	NEW WELL	39.9192	-75.19123
184	594711	59471139.91923-75.19124	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3100 S 26th St	19145	1/8/2015	NEW WELL	39.91923	-75.19124
185	594710	59471039.9193-75.1912	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3100 S 26th St	19145	1/7/2015	NEW WELL	39.9193	-75.1912
186	594650	59465039.91913-75.19124	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3106 S 26th St	19145	1/8/2015	OTHER	39.91913	-75.19124
187	594527	59452739.89462-75.22914	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	8000 ESSINGTON AVE	19153	12/10/2010	NEW WELL	39.89462	-75.22914
188	594526	59452639.89459-75.22897	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	8000 ESSINGTON AVE	19153	12/10/2010	NEW WELL	39.89459	-75.22897

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
189	594525	59452539.89489-75.22905	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	8000 ESSINGTON AVE	19153	12/10/2010	NEW WELL	39.89489	-75.22905
190	594165	59416539.91936-75.19122	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3100 S 26th St	19145	1/6/2015	OTHER	39.91936	-75.19122
191	594164	59416439.91919-75.19123	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	3102 S 26th St	19145	1/7/2015	OTHER	39.91919	-75.19123
192	594163	59416339.91707-75.19437	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/5/2014	NEW WELL	39.91707	-75.19437
193	594162	59416239.91684-75.19541	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/10/2014	NEW WELL	39.91684	-75.19541
194	594160	59416039.91953-75.19478	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/8/2014	NEW WELL	39.91953	-75.19478
195	594159	59415939.91919-75.19563	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/9/2014	OTHER	39.91919	-75.19563
196	552538	55253839.91569-75.19208	Point	PHILADELPHIA	PHILADELPHIA				12/3/2013	NEW WELL	39.91569	-75.19208
197	552529	55252939.91752-75.19219	Point	PHILADELPHIA	PHILADELPHIA				2/27/2014	NEW WELL	39.91752	-75.19219
198	552528	55252839.92107-75.19153	Point	PHILADELPHIA	PHILADELPHIA				2/25/2014	NEW WELL	39.92107	-75.19153
199	552527	55252739.9208-75.19148	Point	PHILADELPHIA	PHILADELPHIA				2/4/2014	NEW WELL	39.9208	-75.19148
200	552526	55252639.91301-75.19408	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	2615 Hartranft St		1/9/2014	NEW WELL	39.91301	-75.19408
201	552525	55252539.91783-75.19622	Point	PHILADELPHIA	PHILADELPHIA				1/15/2014	NEW WELL	39.91783	-75.19622
202	552524	55252439.91667-75.19388	Point	PHILADELPHIA	PHILADELPHIA				12/18/2013	NEW WELL	39.91667	-75.19388
203	552406	55240639.91773-75.1962	Point	PHILADELPHIA	PHILADELPHIA				3/11/2014	NEW WELL	39.91773	-75.1962
204	552392	55239239.91779-75.1962	Point	PHILADELPHIA	PHILADELPHIA				3/12/2014	NEW WELL	39.91779	-75.1962
205	552351	55235139.91779-75.1962	Point	PHILADELPHIA	PHILADELPHIA				3/6/2014	NEW WELL	39.91779	-75.1962
206	552350	55235039.91576-75.19208	Point	PHILADELPHIA	PHILADELPHIA				3/5/2014	NEW WELL	39.91576	-75.19208
207	552340	55234039.91665-75.19384	Point	PHILADELPHIA	PHILADELPHIA				3/4/2014	NEW WELL	39.91665	-75.19384
208	552339	55233939.9209-75.19156	Point	PHILADELPHIA	PHILADELPHIA				2/20/2014	NEW WELL	39.9209	-75.19156
209	552338	55233839.9175-75.19216	Point	PHILADELPHIA	PHILADELPHIA				12/19/2013	NEW WELL	39.9175	-75.19216
210	514968	51496839.92686-75.22872	Point	PHILADELPHIA	PHILADELPHIA		2231 S. 62nd St.	19142	3/6/2014	NEW WELL	39.92686	-75.22872
211	514233	51423339.92399-75.17616	Point	PHILADELPHIA	PHILADELPHIA		18 & Passyunk Ave	19145	5/27/2014	WELL ABANDONMENT	39.92399	-75.17616
212	514232	51423239.92414-75.17605	Point	PHILADELPHIA	PHILADELPHIA		18 & Passyunk Ave	19145	5/27/2014	WELL ABANDONMENT	39.92414	-75.17605
213	514166	51416639.92411-75.17622	Point	PHILADELPHIA	PHILADELPHIA		18 & Passyunk Ave	19145	5/27/2014	WELL ABANDONMENT	39.92411	-75.17622
214	514164	51416439.92412-75.17613	Point	PHILADELPHIA	PHILADELPHIA		18 & Passyunk Ave	19145	5/27/2014	WELL ABANDONMENT	39.92412	-75.17613
215	512488	51248839.90253-75.19467	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90253	-75.19467
216	512487	51248739.90339-75.19633	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90339	-75.19633
217	512486	51248639.90158-75.19606	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90158	-75.19606
218	512485	51248539.90114-75.19694	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90114	-75.19694
219	512484	51248439.90172-75.19647	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90172	-75.19647
220	512483	51248339.90214-75.19578	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90214	-75.19578
221	512482	51248239.90308-75.19547	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90308	-75.19547
222	512467	51246739.90161-75.19622	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90161	-75.19622
223	512466	51246639.90167-75.19744	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	7/13/2013	WELL ABANDONMENT	39.90167	-75.19744
224	512465	51246539.90258-75.19628	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90258	-75.19628
225	512464	51246439.90328-75.19667	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90328	-75.19667
226	512463	51246339.90233-75.19761	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90233	-75.19761
227	512462	51246239.90403-75.19439	Point	PHILADELPHIA	PHILADELPHIA		26th Street	19145	6/13/2013	WELL ABANDONMENT	39.90403	-75.19439
228	510997	51099739.9379-75.21642	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	5200 Woodland ave. Philadelphia PA	19143	12/5/2013	NEW WELL	39.9379	-75.21642
229	510993	51099339.9379-75.2162	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	5200 Woodland Ave. Philadelphia PA	19143	12/5/2013	NEW WELL	39.9379	-75.2162
230	510985	51098539.938-75.2161	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	5200 Woodland Ave. Philadelphia PA	19143	12/4/2013	NEW WELL	39.938	-75.2161
231	510983	51098339.93808-75.21626	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	5200 Woodland Ave. Philadelphia PA	19143	12/5/2013	NEW WELL	39.93808	-75.21626
232	510959	51095939.93807-75.21633	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	5200 Woodlsnd Ave. Philadelphia	19143	12/4/2013	NEW WELL	39.93807	-75.21633
233	510374	51037439.90555-75.19301	Point	PHILADELPHIA					5/8/2013	NEW WELL	39.90555	-75.19301
234	504918	50491839.92636-75.21412	Point	PHILADELPHIA			2751 S. 58th Street Philadelphia PA		2/13/2013	NEW WELL	39.92636	-75.21412
235	504475	50447539.91443-75.18673	Point	PHILADELPHIA			S. 23rd Street Philadelphia PA 19145		1/14/2013	NEW WELL	39.91443	-75.18673
236	502555	50255539.91021-75.2181	Point	PHILADELPHIA	PHILADELPHIA		6850 Essington Ave	19153	10/15/2012	NEW WELL	39.91021	-75.2181
237	502554	50255439.91034-75.21808	Point	PHILADELPHIA	PHILADELPHIA		6850 Essington Ave	19153	10/15/2012	NEW WELL	39.91034	-75.21808
238	502519	50251939.90593-75.21824	Point	PHILADELPHIA	PHILADELPHIA		6850 Essington Ave	19153	10/15/2012	NEW WELL	39.90593	-75.21824
239	500377	50037739.92537-75.22092	Point	PHILADELPHIA			5245 Lindbergh Blvd Philadelphia	19143	9/14/2010	NEW WELL	39.92537	-75.22092
240	500376	50037639.92565-75.22125	Point	PHILADELPHIA			5945 Lindbergh Blvd Philadelphia	19143	9/14/2010	NEW WELL	39.92565	-75.22125
241	500375	50037539.92561-75.22165	Point	PHILADELPHIA			5945 Lindbergh Blvd Philadelphia	19143	9/13/2010	NEW WELL	39.92561	-75.22165
242	500145	50014539.90485-75.17715	Point	PHILADELPHIA			1515 Arch St. Philadelphia	19102	4/26/2012	WELL ABANDONMENT	39.90485	-75.17715
243	500144	50014439.90485-75.177	Point	PHILADELPHIA			1515 Arch St. Philadelphia	19102	4/26/2006	WELL ABANDONMENT	39.90485	-75.177
244	500143	50014339.90491-75.17716	Point	PHILADELPHIA			1515 Arch Street Philadelphia	19102	4/26/2006	WELL ABANDONMENT	39.90491	-75.17716
245	500142	50014239.90515-75.17674	Point	PHILADELPHIA			1515 Arch Street Philadelphia	19102	4/26/2006	WELL ABANDONMENT	39.90515	-75.17674
246	500069	50006939.90472-75.17722	Point	PHILADELPHIA			1515 Arch St Philadelphia	19102	7/6/2006	WELL ABANDONMENT	39.90472	-75.17722
247	500068	50006839.90479-75.1773	Point	PHILADELPHIA			1515 Arch St Philadelphia	19102	7/6/2006	WELL ABANDONMENT	39.90479	-75.1773
248	500067	50006739.90486-75.17737	Point	PHILADELPHIA			1515 Arch St Philadelphia	19102	7/6/2006	WELL ABANDONMENT	39.90486	-75.17737
249	500066	50006639.90501-75.17699	Point	PHILADELPHIA			1515 Arch St Philadelphia	19102	4/26/2006	WELL ABANDONMENT	39.90501	-75.17699
250	499803	49980339.92536-75.2209	Point	PHILADELPHIA			5945 Lindbergh Blvd Philadelphia PA	19143	12/22/2011	NEW WELL	39.92536	-75.2209
251	499726	49972639.92527-75.22082	Point	PHILADELPHIA			5945 Lindbergh Blvd Philadelphia PA	19143	10/22/2011	NEW WELL	39.92527	-75.22082

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
252	499508	49950839.91599-75.21521	Point	PHILADELPHIA	PHILADELPHIA		6310 Passyunk Ave. Phila. PA		5/18/2012	WELL ABANDONMENT	39.91599	-75.21521
253	499506	49950639.91599-75.21521	Point	PHILADELPHIA	PHILADELPHIA		6310 Passyunk Ave. Phila. PA		5/18/2012	NEW WELL	39.91599	-75.21521
254	497975	49797539.90143-75.21995	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6770 Essington Avenue	19153	7/7/2011	NEW WELL	39.90143	-75.21995
255	497842	49784239.91771-75.23501	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6901 Buist Avenue	19140	1/30/2012	NEW WELL	39.91771	-75.23501
256	497824	49782439.91692-75.23498	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6901 Buist Avnue	19140	1/27/2012	NEW WELL	39.91692	-75.23498
257	497823	49782339.91706-75.23489	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6901 Buist Avenue	19140	1/30/2012	NEW WELL	39.91706	-75.23489
258	497767	49776739.91713-75.23495	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6901 Buist Avenue	19140	1/31/2012	NEW WELL	39.91713	-75.23495
259	497456	49745639.91386-75.20112	Point	PHILADELPHIA	PHILADELPHIA				6/10/2010	NEW WELL	39.91386	-75.20112
260	497455	49745539.91509-75.19739	Point	PHILADELPHIA	PHILADELPHIA				6/4/2010	NEW WELL	39.91509	-75.19739
261	497454	49745439.90783-75.21133	Point	PHILADELPHIA	PHILADELPHIA				6/2/2010	NEW WELL	39.90783	-75.21133
262	496800	49680039.90421-75.20569	Point	PHILADELPHIA	PHILADELPHIA				6/15/2010	NEW WELL	39.90421	-75.20569
263	496797	49679739.91566-75.20127	Point	PHILADELPHIA	PHILADELPHIA				5/7/2010	NEW WELL	39.91566	-75.20127
264	496796	49679639.91554-75.20161	Point	PHILADELPHIA	PHILADELPHIA				5/11/2010	NEW WELL	39.91554	-75.20161
265	496795	49679539.91554-75.20161	Point	PHILADELPHIA	PHILADELPHIA				5/11/2010	NEW WELL	39.91554	-75.20161
266	496791	49679139.91556-75.20143	Point	PHILADELPHIA	PHILADELPHIA				5/11/2010	NEW WELL	39.91556	-75.20143
267	496790	49679039.91556-75.20126	Point	PHILADELPHIA	PHILADELPHIA				5/7/2010	NEW WELL	39.91556	-75.20126
268	496789	49678939.91301-75.19746	Point	PHILADELPHIA	PHILADELPHIA				5/18/2010	NEW WELL	39.91301	-75.19746
269	496788	49678839.91551-75.20012	Point	PHILADELPHIA	PHILADELPHIA				5/21/2010	NEW WELL	39.91551	-75.20012
270	496787	49678739.90966-75.21112	Point	PHILADELPHIA	PHILADELPHIA				6/3/2010	NEW WELL	39.90966	-75.21112
271	496542	49654239.94667-75.19917	Point	PHILADELPHIA	PHILADELPHIA		UNIVERSITY AVENUE		3/31/2009	NEW WELL	39.94667	-75.19917
272	496542	49654239.94667-75.19917	Point	PHILADELPHIA	PHILADELPHIA		UNIVERSITY AVENUE		3/31/2009	NEW WELL	39.94667	-75.19917
273	495284	49528439.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/16/2009	NEW WELL	39.915	-75.19222
274	495283	49528339.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/12/2009	NEW WELL	39.915	-75.19222
275	490718	49071839.93015-75.20083	Point	PHILADELPHIA	PHILADELPHIA				9/16/2011	NEW WELL	39.93015	-75.20083
276	490716	49071639.9303-75.20139	Point	PHILADELPHIA	PHILADELPHIA				9/19/2011	NEW WELL	39.9303	-75.20139
277	490715	49071539.9311-75.20052	Point	PHILADELPHIA	PHILADELPHIA				9/14/2011	NEW WELL	39.9311	-75.20052
278	490586	49058639.93277-75.21628	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93277	-75.21628
279	490585	49058539.93254-75.21639	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93254	-75.21639
280	490584	49058439.93267-75.21629	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93267	-75.21629
281	490583	49058339.93279-75.2163	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93279	-75.2163
282	490582	49058239.93264-75.21636	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93264	-75.21636
283	490581	49058139.93267-75.21635	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93267	-75.21635
284	490363	49036339.92997-75.20042	Point	PHILADELPHIA	PHILADELPHIA				9/15/2011	NEW WELL	39.92997	-75.20042
285	490280	49028039.93276-75.21637	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93276	-75.21637
286	490279	49027939.93292-75.21645	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93292	-75.21645
287	490278	49027839.93285-75.21667	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93285	-75.21667
288	490277	49027739.9328-75.21621	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.9328	-75.21621
289	490121	49012139.93272-75.21634	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93272	-75.21634
290	490120	49012039.93274-75.2164	Point	PHILADELPHIA	PHILADELPHIA		5364 Lindbergh Blvd Philadelphai	19143	8/30/2011	WELL ABANDONMENT	39.93274	-75.2164
291	489934	48993439.91763-75.201	Point	PHILADELPHIA					8/26/2011	NEW WELL	39.91763	-75.201
292	488645	48864539.91555-75.20272	Point	PHILADELPHIA					8/22/2011	NEW WELL	39.91555	-75.20272
293	488537	48853739.91215-75.19235	Point	PHILADELPHIA					6/29/2011	NEW WELL	39.91215	-75.19235
294	488007	48800739.91776-75.20135	Point	PHILADELPHIA					8/25/2011	NEW WELL	39.91776	-75.20135
295	488006	48800639.91698-75.20149	Point	PHILADELPHIA					8/25/2011	NEW WELL	39.91698	-75.20149
296	488005	48800539.91721-75.20174	Point	PHILADELPHIA					8/23/2011	NEW WELL	39.91721	-75.20174
297	488004	48800439.91549-75.20251	Point	PHILADELPHIA					8/22/2011	NEW WELL	39.91549	-75.20251
298	487864	48786439.91278-75.19201	Point	PHILADELPHIA					6/28/2011	NEW WELL	39.91278	-75.19201
299	487862	48786239.91258-75.19209	Point	PHILADELPHIA					7/7/2011	NEW WELL	39.91258	-75.19209
300	487862	48786239.91258-75.19209	Point	PHILADELPHIA					7/7/2011	NEW WELL	39.91258	-75.19209
301	487860	48786039.91324-75.19208	Point	PHILADELPHIA					6/29/2011	NEW WELL	39.91324	-75.19208
302	487857	48785739.9169-75.2351	Point	PHILADELPHIA	PHILADELPHIA		6901 Buist Ave. Phila. PA		8/2/2011	NEW WELL	39.9169	-75.2351
303	487856	48785639.9171-75.235	Point	PHILADELPHIA	PHILADELPHIA		6901 Buist Ave. Phila. PA		8/2/2011	NEW WELL	39.9171	-75.235
304	487855	48785539.917-75.235	Point	PHILADELPHIA	PHILADELPHIA		6901 Buist Ave. Phila. PA		8/1/2011	NEW WELL	39.917	-75.235
305	486487	48648739.9171-75.235	Point	PHILADELPHIA	PHILADELPHIA		6901 Buist Ave. Phila. PA		8/1/2011	NEW WELL	39.9171	-75.235
306	486018	48601839.90252-75.2247	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA	6850 Essington Avenue	19153	7/20/2009	NEW WELL	39.90252	-75.2247
307	485077	48507739.91878-75.20344	Point	PHILADELPHIA					4/6/2011	NEW WELL	39.91878	-75.20344
308	485077	48507739.91878-75.20344	Point	PHILADELPHIA					4/6/2011	NEW WELL	39.91878	-75.20344
309	485077	48507739.91878-75.20344	Point	PHILADELPHIA					4/6/2011	NEW WELL	39.91878	-75.20344
310	484904	48490439.92218-75.21929	Point	PHILADELPHIA	PHILADELPHIA		3062 S. 61ST STREET		10/21/2011	WELL ABANDONMENT	39.92218	-75.21929
311	484903	48490339.92117-75.21998	Point	PHILADELPHIA	PHILADELPHIA		3062 S. 61ST STREET		10/21/2011	WELL ABANDONMENT	39.92117	-75.21998
312	484902	48490239.92158-75.21834	Point	PHILADELPHIA	PHILADELPHIA		3062 S. 61ST STREET		10/21/2011	WELL ABANDONMENT	39.92158	-75.21834
313	484901	48490139.92057-75.21847	Point	PHILADELPHIA	PHILADELPHIA		3062 S. 61ST STREET		10/21/2011	WELL ABANDONMENT	39.92057	-75.21847
314	484853	48485339.91644-75.20606	Point	PHILADELPHIA					4/18/2011	NEW WELL	39.91644	-75.20606

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FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
315	484851	48485139.91787-75.20547	Point	PHILADELPHIA					4/19/2011	NEW WELL	39.91787	-75.20547
316	484808	48480839.91472-75.20708	Point	PHILADELPHIA					4/15/2011	NEW WELL	39.91472	-75.20708
317	484807	48480739.91442-75.20888	Point	PHILADELPHIA					4/18/2011	NEW WELL	39.91442	-75.20888
318	484807	48480739.91442-75.20888	Point	PHILADELPHIA					4/18/2011	NEW WELL	39.91442	-75.20888
319	484807	48480739.91442-75.20888	Point	PHILADELPHIA					4/18/2011	NEW WELL	39.91442	-75.20888
320	484591	48459139.94528-75.19917	Point	PHILADELPHIA	PHILADELPHIA		UNIVERSITY AVENUE		3/31/2009	NEW WELL	39.94528	-75.19917
321	484591	48459139.94528-75.19917	Point	PHILADELPHIA	PHILADELPHIA		UNIVERSITY AVENUE		3/31/2009	NEW WELL	39.94528	-75.19917
322	484293	48429339.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/19/2009	NEW WELL	39.915	-75.19222
323	484292	48429239.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/18/2009	NEW WELL	39.915	-75.19222
324	484266	48426639.91557-75.21262	Point	PHILADELPHIA					4/20/2011	NEW WELL	39.91557	-75.21262
325	484265	48426539.91549-75.20993	Point	PHILADELPHIA					4/20/2011	NEW WELL	39.91549	-75.20993
326	484264	48426439.91445-75.20898	Point	PHILADELPHIA					4/18/2011	NEW WELL	39.91445	-75.20898
327	484263	48426339.91709-75.20435	Point	PHILADELPHIA					4/19/2011	NEW WELL	39.91709	-75.20435
328	484164	48416439.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/17/2009	NEW WELL	39.915	-75.19222
329	484163	48416339.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/12/2009	NEW WELL	39.915	-75.19222
330	484162	48416239.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/12/2009	NEW WELL	39.915	-75.19222
331	484161	48416139.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/16/2009	NEW WELL	39.915	-75.19222
332	484160	48416039.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/17/2009	NEW WELL	39.915	-75.19222
333	484158	48415839.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/18/2009	NEW WELL	39.915	-75.19222
334	484156	48415639.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/19/2009	NEW WELL	39.915	-75.19222
335	484155	48415539.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/12/2009	NEW WELL	39.915	-75.19222
336	484154	48415439.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/4/2009	NEW WELL	39.915	-75.19222
337	484153	48415339.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/3/2009	NEW WELL	39.915	-75.19222
338	484152	48415239.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				1/29/2009	NEW WELL	39.915	-75.19222
339	484151	48415139.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				1/28/2009	NEW WELL	39.915	-75.19222
340	484057	48405739.9212-75.21658	Point	PHILADELPHIA	PHILADELPHIA		3062 S. 61ST STREET		10/21/2011	WELL ABANDONMENT	39.9212	-75.21658
341	484055	48405539.9197-75.21704	Point	PHILADELPHIA	PHILADELPHIA		3062 S. 61ST STREET		10/21/2011	WELL ABANDONMENT	39.9197	-75.21704
342	48395	4839539.92778-75.21111	Point	PHILADELPHIA		PHILADELPHIA			5/31/1995		39.92778	-75.21111
343	48394	4839439.9275-75.20667	Point	PHILADELPHIA		PHILADELPHIA			11/5/1981		39.9275	-75.20667
344	48393	4839339.92722-75.20278	Point	PHILADELPHIA		PHILADELPHIA			5/12/1994		39.92722	-75.20278
345	48392	4839239.92722-75.20222	Point	PHILADELPHIA		PHILADELPHIA			5/11/1994		39.92722	-75.20222
346	48391	4839139.92722-75.20167	Point	PHILADELPHIA		PHILADELPHIA			5/12/1994		39.92722	-75.20167
347	48390	4839039.92694-75.20333	Point	PHILADELPHIA		PHILADELPHIA			5/10/1994		39.92694	-75.20333
348	483890	48389039.91016-75.21783	Point	PHILADELPHIA	PHILADELPHIA		6850 Essington Ave. Phila. Pa		4/5/2010	WELL ABANDONMENT	39.91016	-75.21783
349	48389	4838939.92694-75.20222	Point	PHILADELPHIA		PHILADELPHIA			6/2/1995		39.92694	-75.20222
350	483882	48388239.91013-75.21785	Point	PHILADELPHIA	PHILADELPHIA		6850 Essington Ave. Phila. Pa		4/5/2010	NEW WELL	39.91013	-75.21785
351	48388	4838839.92694-75.20139	Point	PHILADELPHIA		PHILADELPHIA			6/5/1995		39.92694	-75.20139
352	48387	4838739.92694-75.20111	Point	PHILADELPHIA		PHILADELPHIA			5/13/1994		39.92694	-75.20111
353	48386	4838639.92694-75.20083	Point	PHILADELPHIA		PHILADELPHIA			6/5/1995		39.92694	-75.20083
354	48385	4838539.92694-75.20056	Point	PHILADELPHIA		PHILADELPHIA			5/11/1994		39.92694	-75.20056
355	48384	4838439.92667-75.21167	Point	PHILADELPHIA		PHILADELPHIA			6/1/1995		39.92667	-75.21167
356	48383	4838339.92361-75.20028	Point	PHILADELPHIA		PHILADELPHIA			<Null>		39.92361	-75.20028
357	48382	4838239.92333-75.20083	Point	PHILADELPHIA		PHILADELPHIA			10/11/1994		39.92333	-75.20083
358	48381	4838139.92306-75.20222	Point	PHILADELPHIA		PHILADELPHIA			5/19/1994		39.92306	-75.20222
359	48380	4838039.92306-75.20167	Point	PHILADELPHIA		PHILADELPHIA			10/19/1994		39.92306	-75.20167
360	48379	4837939.92278-75.20333	Point	PHILADELPHIA		PHILADELPHIA			5/18/1994		39.92278	-75.20333
361	48378	4837839.92278-75.20278	Point	PHILADELPHIA		PHILADELPHIA			5/17/1994		39.92278	-75.20278
362	48376	4837639.92194-75.20778	Point	PHILADELPHIA		PHILADELPHIA			6/1/1995		39.92194	-75.20778
363	48374	4837439.91972-75.19056	Point	PHILADELPHIA		PHILADELPHIA			5/26/1994		39.91972	-75.19056
364	48373	4837339.91833-75.19167	Point	PHILADELPHIA		PHILADELPHIA			9/9/1993		39.91833	-75.19167
365	48372	4837239.91806-75.19139	Point	PHILADELPHIA		PHILADELPHIA			5/24/1994		39.91806	-75.19139
366	48371	4837139.91778-75.19167	Point	PHILADELPHIA		PHILADELPHIA			7/1/1994		39.91778	-75.19167
367	48370	4837039.91722-75.19167	Point	PHILADELPHIA		PHILADELPHIA			8/25/1994		39.91722	-75.19167
368	48369	4836939.91639-75.19167	Point	PHILADELPHIA		PHILADELPHIA			5/20/1994		39.91639	-75.19167
369	48368	4836839.91556-75.20278	Point	PHILADELPHIA		PHILADELPHIA			8/9/1995		39.91556	-75.20278
370	48367	4836739.91556-75.20111	Point	PHILADELPHIA		PHILADELPHIA			5/9/1994		39.91556	-75.20111
371	48366	4836639.91528-75.20278	Point	PHILADELPHIA		PHILADELPHIA			8/3/1995		39.91528	-75.20278
372	48365	4836539.91528-75.20139	Point	PHILADELPHIA		PHILADELPHIA			5/5/1994		39.91528	-75.20139
373	48364	4836439.91528-75.20028	Point	PHILADELPHIA		PHILADELPHIA			5/10/1994		39.91528	-75.20028
374	48363	4836339.91528-75.19972	Point	PHILADELPHIA		PHILADELPHIA			5/9/1994		39.91528	-75.19972
375	48362	4836239.915-75.20306	Point	PHILADELPHIA		PHILADELPHIA			8/9/1995		39.915	-75.20306
376	48360	4836039.91444-75.20306	Point	PHILADELPHIA		PHILADELPHIA			8/2/1995		39.91444	-75.20306
377	483515	48351539.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/11/2009	NEW WELL	39.915	-75.19222

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
378	483493	48349339.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/13/2009	NEW WELL	39.915	-75.19222
379	483492	48349239.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/12/2009	NEW WELL	39.915	-75.19222
380	483491	48349139.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/10/2009	NEW WELL	39.915	-75.19222
381	483490	48349039.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/11/2009	NEW WELL	39.915	-75.19222
382	483489	48348939.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/17/2009	NEW WELL	39.915	-75.19222
383	483488	48348839.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/18/2009	NEW WELL	39.915	-75.19222
384	483487	48348739.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/10/2009	NEW WELL	39.915	-75.19222
385	483486	48348639.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/6/2009	NEW WELL	39.915	-75.19222
386	483484	48348439.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				2/4/2009	NEW WELL	39.915	-75.19222
387	483483	48348339.915-75.19222	Point	PHILADELPHIA	PHILADELPHIA				1/27/2009	NEW WELL	39.915	-75.19222
388	482354	48235439.9145-75.2172	Point	PHILADELPHIA	PHILADELPHIA		6310 Passayunk Ave. Phila. Pa		8/13/2010	NEW WELL	39.9145	-75.2172
389	48204	4820439.92806-75.21028	Point	PHILADELPHIA		PHILADELPHIA			2/25/1994		39.92806	-75.21028
390	48203	4820339.91944-75.19972	Point	PHILADELPHIA		PHILADELPHIA			3/4/1994		39.91944	-75.19972
391	48202	4820239.91556-75.20278	Point	PHILADELPHIA		PHILADELPHIA			8/10/1995		39.91556	-75.20278
392	48201	4820139.91556-75.20278	Point	PHILADELPHIA		PHILADELPHIA			8/18/1995		39.91556	-75.20278
393	48200	4820039.90889-75.20528	Point	PHILADELPHIA		PHILADELPHIA			3/2/1994		39.90889	-75.20528
394	48199	4819939.90667-75.19444	Point	PHILADELPHIA		PHILADELPHIA			3/14/1994		39.90667	-75.19444
395	48198	4819839.88528-75.21278	Point	PHILADELPHIA		PHILADELPHIA			2/2/1994		39.88528	-75.21278
396	48198	4819839.88528-75.21278	Point	PHILADELPHIA		PHILADELPHIA			2/2/1994		39.88528	-75.21278
397	48198	4819839.88528-75.21278	Point	PHILADELPHIA		PHILADELPHIA			2/2/1994		39.88528	-75.21278
398	48197	4819739.88472-75.21861	Point	PHILADELPHIA		PHILADELPHIA			2/16/1994		39.88472	-75.21861
399	48197	4819739.88472-75.21861	Point	PHILADELPHIA		PHILADELPHIA			2/16/1994		39.88472	-75.21861
400	481942	48194239.91521-75.20211	Point	PHILADELPHIA	PHILADELPHIA				5/21/2010	NEW WELL	39.91521	-75.20211
401	481799	48179939.91602-75.20011	Point	PHILADELPHIA	PHILADELPHIA				6/11/2010	NEW WELL	39.91602	-75.20011
402	481798	48179839.91584-75.2014	Point	PHILADELPHIA	PHILADELPHIA				5/12/2010	NEW WELL	39.91584	-75.2014
403	481793	48179339.91435-75.19581	Point	PHILADELPHIA	PHILADELPHIA				5/19/2010	NEW WELL	39.91435	-75.19581
404	481792	48179239.91671-75.19776	Point	PHILADELPHIA	PHILADELPHIA				5/20/2010	NEW WELL	39.91671	-75.19776
405	481791	48179139.91709-75.20012	Point	PHILADELPHIA	PHILADELPHIA				6/8/2010	NEW WELL	39.91709	-75.20012
406	481790	48179039.91783-75.19931	Point	PHILADELPHIA	PHILADELPHIA				5/25/2010	NEW WELL	39.91783	-75.19931
407	481789	48178939.92019-75.19679	Point	PHILADELPHIA	PHILADELPHIA				5/26/2010	NEW WELL	39.92019	-75.19679
408	481787	48178739.91913-75.20033	Point	PHILADELPHIA	PHILADELPHIA				6/16/2010	NEW WELL	39.91913	-75.20033
409	481782	48178239.90987-75.20477	Point	PHILADELPHIA	PHILADELPHIA				5/18/2010	NEW WELL	39.90987	-75.20477
410	481781	48178139.91163-75.20079	Point	PHILADELPHIA	PHILADELPHIA				5/1/2010	NEW WELL	39.91163	-75.20079
411	481778	48177839.90982-75.21231	Point	PHILADELPHIA	PHILADELPHIA				6/3/2010	NEW WELL	39.90982	-75.21231
412	481776	48177639.9061-75.21426	Point	PHILADELPHIA	PHILADELPHIA				5/26/2010	NEW WELL	39.9061	-75.21426
413	481770	48177039.90672-75.21071	Point	PHILADELPHIA	PHILADELPHIA				5/27/2010	NEW WELL	39.90672	-75.21071
414	481764	48176439.90485-75.20739	Point	PHILADELPHIA	PHILADELPHIA				6/15/2010	NEW WELL	39.90485	-75.20739
415	481763	48176339.90421-75.20569	Point	PHILADELPHIA	PHILADELPHIA				6/3/2010	NEW WELL	39.90421	-75.20569
416	481762	48176239.90896-75.20578	Point	PHILADELPHIA	PHILADELPHIA				6/2/2010	NEW WELL	39.90896	-75.20578
417	481761	48176139.91001-75.20656	Point	PHILADELPHIA	PHILADELPHIA				6/2/2010	NEW WELL	39.91001	-75.20656
418	481332	48133239.91354-75.22156	Point	PHILADELPHIA	PHILADELPHIA		6850 Essington Ave	19019	10/13/2011	NEW WELL	39.91354	-75.22156
419	481229	48122939.9216-75.21833	Point	PHILADELPHIA			3062 South 61st.Street Philadelphia Pa		8/10/2009	NEW WELL	39.9216	-75.21833
420	481023	48102339.91602-75.20174	Point	PHILADELPHIA	PHILADELPHIA				5/12/2010	NEW WELL	39.91602	-75.20174
421	481021	48102139.91585-75.19702	Point	PHILADELPHIA	PHILADELPHIA				6/8/2010	NEW WELL	39.91585	-75.19702
422	481020	48102039.91846-75.20013	Point	PHILADELPHIA	PHILADELPHIA				5/5/2010	NEW WELL	39.91846	-75.20013
423	481018	48101839.91921-75.19765	Point	PHILADELPHIA	PHILADELPHIA				6/9/2010	NEW WELL	39.91921	-75.19765
424	481016	48101639.90708-75.20293	Point	PHILADELPHIA	PHILADELPHIA				6/16/2010	NEW WELL	39.90708	-75.20293
425	481013	48101339.91004-75.20221	Point	PHILADELPHIA	PHILADELPHIA				5/14/2010	NEW WELL	39.91004	-75.20221
426	481002	48100239.90545-75.21198	Point	PHILADELPHIA	PHILADELPHIA				5/27/2010	NEW WELL	39.90545	-75.21198
427	480994	48099439.90693-75.20995	Point	PHILADELPHIA	PHILADELPHIA				6/10/2010	NEW WELL	39.90693	-75.20995
428	479770	47977039.91889-75.19167	Point	PHILADELPHIA					8/5/2008	NEW WELL	39.91889	-75.19167
429	479415	47941539.91889-75.19167	Point	PHILADELPHIA					8/12/2008	NEW WELL	39.91889	-75.19167
430	478889	47888939.91806-75.19167	Point	PHILADELPHIA					8/13/2008	NEW WELL	39.91806	-75.19167
431	478886	47888639.91556-75.19361	Point	PHILADELPHIA					8/27/2008	NEW WELL	39.91556	-75.19361
432	478853	47885339.91917-75.19167	Point	PHILADELPHIA					7/31/2008	NEW WELL	39.91917	-75.19167
433	478852	47885239.91917-75.19167	Point	PHILADELPHIA					7/30/2008	NEW WELL	39.91917	-75.19167
434	478667	47866739.91583-75.19528	Point	PHILADELPHIA					8/27/2008	NEW WELL	39.91583	-75.19528
435	478648	47864839.91944-75.19167	Point	PHILADELPHIA					7/29/2008	NEW WELL	39.91944	-75.19167
436	478098	47809839.94556-75.19889	Point	PHILADELPHIA	PHILADELPHIA		UNIVERSITY AVENUE		10/29/2008	NEW WELL	39.94556	-75.19889
437	478098	47809839.94556-75.19889	Point	PHILADELPHIA	PHILADELPHIA		UNIVERSITY AVENUE		10/29/2008	NEW WELL	39.94556	-75.19889
438	477824	47782439.93593-75.21456	Point	PHILADELPHIA	PHILADELPHIA		5201 Grays Ave Philadelphia	19143	4/1/2011	WELL ABANDONMENT	39.93593	-75.21456
439	477823	47782339.93483-75.21365	Point	PHILADELPHIA	PHILADELPHIA		5201 Grays Ave Philadelphia	19143	4/1/2011	WELL ABANDONMENT	39.93483	-75.21365
440	477821	47782139.93588-75.2148	Point	PHILADELPHIA	PHILADELPHIA		5201 Grays Ave Philadelphia	19143	4/1/2011	WELL ABANDONMENT	39.93588	-75.2148

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Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
441	477819	47781939.93598-75.214	Point	PHILADELPHIA	PHILADELPHIA		5201 Grays Ave Philadelphia	19143	4/1/2011	WELL ABANDONMENT	39.93598	-75.214
442	477745	47774539.9396-75.1916	Point	PHILADELPHIA	PHILADELPHIA		30th Street & Grays Ferry Ave. Phila. Pa		2/9/2011	NEW WELL	39.9396	-75.1916
443	477570	47757039.9399-75.1913	Point	PHILADELPHIA	PHILADELPHIA		30th Street & Grays Ferry Ave. Phila. Pa		2/9/2011	NEW WELL	39.9399	-75.1913
444	477165	47716539.93556-75.21501	Point	PHILADELPHIA	PHILADELPHIA		5201 Grays Ave Philadelphia	19143	4/1/2011	WELL ABANDONMENT	39.93556	-75.21501
445	476031	47603139.8992-75.2265	Point	PHILADELPHIA	PHILADELPHIA		1952 Bryn Mawr Ave. Phila. PA		9/29/2011	NEW WELL	39.8992	-75.2265
446	475994	47599439.93008-75.20006	Point	PHILADELPHIA	PHILADELPHIA				9/13/2011	NEW WELL	39.93008	-75.20006
447	475993	47599339.93133-75.2003	Point	PHILADELPHIA	PHILADELPHIA				9/14/2011	NEW WELL	39.93133	-75.2003
448	475283	47528339.93166-75.20069	Point	PHILADELPHIA	PHILADELPHIA		1851 S 34TH ST.	19145	5/23/2011	NEW WELL	39.93166	-75.20069
449	475171	47517139.93162-75.20051	Point	PHILADELPHIA	PHILADELPHIA		1851 S 34TH ST.	19145	5/23/2011	NEW WELL	39.93162	-75.20051
450	475170	47517039.93143-75.20034	Point	PHILADELPHIA	PHILADELPHIA		1851 S 34TH ST.	19145	5/23/2011	NEW WELL	39.93143	-75.20034
451	475169	47516939.93176-75.20069	Point	PHILADELPHIA	PHILADELPHIA		1851 S 34TH ST.	19145	5/23/2011	NEW WELL	39.93176	-75.20069
452	475168	47516839.93166-75.20069	Point	PHILADELPHIA	PHILADELPHIA		1851 S 34TH ST.	19145	5/23/2011	NEW WELL	39.93166	-75.20069
453	474515	47451539.91889-75.19167	Point	PHILADELPHIA					8/5/2008	NEW WELL	39.91889	-75.19167
454	473933	47393339.93655-75.21016	Point	PHILADELPHIA	PHILADELPHIA		1630	19143	11/21/2010	NEW WELL	39.93655	-75.21016
455	424578	42457839.93139-75.20306	Point	PHILADELPHIA	PHILADELPHIA				6/13/2008	NEW WELL	39.93139	-75.20306
456	424577	42457739.92611-75.20778	Point	PHILADELPHIA	PHILADELPHIA				5/13/2008	NEW WELL	39.92611	-75.20778
457	424576	42457639.92417-75.20028	Point	PHILADELPHIA	PHILADELPHIA				6/17/2008	NEW WELL	39.92417	-75.20028
458	424572	42457239.92833-75.20194	Point	PHILADELPHIA	PHILADELPHIA				6/20/2008	NEW WELL	39.92833	-75.20194
459	424571	42457139.9275-75.20111	Point	PHILADELPHIA	PHILADELPHIA				6/18/2008	NEW WELL	39.9275	-75.20111
460	424570	42457039.92833-75.20111	Point	PHILADELPHIA	PHILADELPHIA				6/18/2008	NEW WELL	39.92833	-75.20111
461	424565	42456539.92361-75.20167	Point	PHILADELPHIA	PHILADELPHIA				7/1/2008	NEW WELL	39.92361	-75.20167
462	424563	42456339.90194-75.23833	Point	PHILADELPHIA	PHILADELPHIA		4101 ISLAND AVENUE	19153	11/9/2007	NEW WELL	39.90194	-75.23833
463	424524	42452439.90194-75.23833	Point	PHILADELPHIA	PHILADELPHIA		4101 ISLAND AVENUE	19153	11/9/2007	NEW WELL	39.90194	-75.23833
464	424514	42451439.9325-75.20306	Point	PHILADELPHIA	PHILADELPHIA				6/19/2008	NEW WELL	39.9325	-75.20306
465	424513	42451339.92833-75.19972	Point	PHILADELPHIA	PHILADELPHIA				6/5/2008	NEW WELL	39.92833	-75.19972
466	424512	42451239.92861-75.20194	Point	PHILADELPHIA	PHILADELPHIA				6/5/2008	NEW WELL	39.92861	-75.20194
467	424511	42451139.92667-75.2025	Point	PHILADELPHIA	PHILADELPHIA				6/4/2008	NEW WELL	39.92667	-75.2025
468	424510	42451039.93-75.20028	Point	PHILADELPHIA	PHILADELPHIA				6/2/2008	NEW WELL	39.93	-75.20028
469	424509	42450939.92667-75.20167	Point	PHILADELPHIA	PHILADELPHIA				5/23/2008	NEW WELL	39.92667	-75.20167
470	424508	42450839.92361-75.20278	Point	PHILADELPHIA	PHILADELPHIA				5/28/2008	NEW WELL	39.92361	-75.20278
471	424507	42450739.9275-75.2	Point	PHILADELPHIA	PHILADELPHIA				5/29/2008	NEW WELL	39.9275	-75.2
472	424506	42450639.92528-75.20167	Point	PHILADELPHIA	PHILADELPHIA				5/29/2008	NEW WELL	39.92528	-75.20167
473	424505	42450539.92806-75.20222	Point	PHILADELPHIA	PHILADELPHIA				5/29/2008	NEW WELL	39.92806	-75.20222
474	424504	42450439.92583-75.19444	Point	PHILADELPHIA	PHILADELPHIA				5/22/2008	NEW WELL	39.92583	-75.19444
475	424503	42450339.92472-75.20667	Point	PHILADELPHIA	PHILADELPHIA				5/13/2008	NEW WELL	39.92472	-75.20667
476	424490	42449039.92722-75.20722	Point	PHILADELPHIA	PHILADELPHIA				7/9/2008	NEW WELL	39.92722	-75.20722
477	424487	42448739.92889-75.19917	Point	PHILADELPHIA	PHILADELPHIA				6/16/2008	NEW WELL	39.92889	-75.19917
478	424479	42447939.92778-75.20056	Point	PHILADELPHIA	PHILADELPHIA				6/9/2008	NEW WELL	39.92778	-75.20056
479	424478	42447839.92611-75.20139	Point	PHILADELPHIA	PHILADELPHIA				6/6/2008	NEW WELL	39.92611	-75.20139
480	424477	42447739.92639-75.19889	Point	PHILADELPHIA	PHILADELPHIA				5/22/2008	NEW WELL	39.92639	-75.19889
481	424476	42447639.925-75.1975	Point	PHILADELPHIA	PHILADELPHIA				5/21/2008	NEW WELL	39.925	-75.1975
482	424475	42447539.925-75.19639	Point	PHILADELPHIA	PHILADELPHIA				5/21/2008	NEW WELL	39.925	-75.19639
483	424474	42447439.92583-75.20139	Point	PHILADELPHIA	PHILADELPHIA				5/21/2008	NEW WELL	39.92583	-75.20139
484	424473	42447339.92417-75.20139	Point	PHILADELPHIA	PHILADELPHIA				5/20/2008	NEW WELL	39.92417	-75.20139
485	424472	42447239.925-75.20333	Point	PHILADELPHIA	PHILADELPHIA				5/20/2008	NEW WELL	39.925	-75.20333
486	424471	42447139.92306-75.20389	Point	PHILADELPHIA	PHILADELPHIA				5/16/2008	NEW WELL	39.92306	-75.20389
487	424470	42447039.92361-75.21	Point	PHILADELPHIA	PHILADELPHIA				5/15/2008	NEW WELL	39.92361	-75.21
488	424469	42446939.92278-75.20972	Point	PHILADELPHIA	PHILADELPHIA				5/15/2008	NEW WELL	39.92278	-75.20972
489	424468	42446839.92194-75.20944	Point	PHILADELPHIA	PHILADELPHIA				5/15/2008	NEW WELL	39.92194	-75.20944
490	424467	42446739.92528-75.20417	Point	PHILADELPHIA	PHILADELPHIA				5/15/2008	NEW WELL	39.92528	-75.20417
491	424466	42446639.92694-75.21083	Point	PHILADELPHIA	PHILADELPHIA				5/14/2008	NEW WELL	39.92694	-75.21083
492	424462	42446239.92778-75.20972	Point	PHILADELPHIA	PHILADELPHIA				5/14/2008	NEW WELL	39.92778	-75.20972
493	424461	42446139.92722-75.2075	Point	PHILADELPHIA	PHILADELPHIA				5/14/2008	NEW WELL	39.92722	-75.2075
494	424457	42445739.92472-75.20917	Point	PHILADELPHIA	PHILADELPHIA				6/18/2008	NEW WELL	39.92472	-75.20917
495	416742	41674239.92167-75.22472	Point	PHILADELPHIA	PHILADELPHIA		67TH ST & ESSINGTON AVE	19153	4/28/2006	NEW WELL	39.92167	-75.22472
496	416741	41674139.92167-75.22472	Point	PHILADELPHIA	PHILADELPHIA		67TH ST & ESSINGTON AVE	19153	4/28/2006	NEW WELL	39.92167	-75.22472
497	416731	41673139.92167-75.22472	Point	PHILADELPHIA	PHILADELPHIA		67TH ST & ESSINGTON AVE	19153	4/28/2006	NEW WELL	39.92167	-75.22472
498	416730	41673039.92167-75.22472	Point	PHILADELPHIA			67TH ST & ESSINGTON AVE	19153	4/28/2006	NEW WELL	39.92167	-75.22472
499	416729	41672939.92167-75.22472	Point	PHILADELPHIA			67TH ST & ESSINGTON AVE	19153	4/28/2006	NEW WELL	39.92167	-75.22472
500	416728	41672839.92167-75.22472	Point	PHILADELPHIA			67TH ST & ESSINGTON AVE	19153	4/28/2006	NEW WELL	39.92167	-75.22472
501	30470	3047039.93972-75.19167	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1946		39.93972	-75.19167
502	30470	3047039.93972-75.19167	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1946		39.93972	-75.19167
503	30468	3046839.93944-75.19944	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1974		39.93944	-75.19944

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
504	30468	3046839.93944-75.19944	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1974		39.93944	-75.19944
505	30467	3046739.93944-75.19139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1934		39.93944	-75.19139
506	30462	3046239.93722-75.20389	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1904		39.93722	-75.20389
507	30460	3046039.93667-75.19917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/27/1936		39.93667	-75.19917
508	30446	3044639.92806-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1921		39.92806	-75.20306
509	30446	3044639.92806-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1921		39.92806	-75.20306
510	30446	3044639.92806-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1921		39.92806	-75.20306
511	30444	3044439.92667-75.20333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1948		39.92667	-75.20333
512	30444	3044439.92667-75.20333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1948		39.92667	-75.20333
513	30444	3044439.92667-75.20333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1948		39.92667	-75.20333
514	30444	3044439.92667-75.20333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1948		39.92667	-75.20333
515	30443	3044339.92639-75.20389	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1904		39.92639	-75.20389
516	30443	3044339.92639-75.20389	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1904		39.92639	-75.20389
517	30442	3044239.92611-75.185	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/1/1936		39.92611	-75.185
518	30442	3044239.92611-75.185	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/1/1936		39.92611	-75.185
519	30439	3043939.92583-75.2025	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			2/15/1946		39.92583	-75.2025
520	30439	3043939.92583-75.2025	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			2/15/1946		39.92583	-75.2025
521	30439	3043939.92583-75.2025	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			2/15/1946		39.92583	-75.2025
522	30431	3043139.92278-75.19972	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1915		39.92278	-75.19972
523	30431	3043139.92278-75.19972	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1915		39.92278	-75.19972
524	30430	3043039.92222-75.19722	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1933		39.92222	-75.19722
525	30422	3042239.9175-75.18222	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1912		39.9175	-75.18222
526	30421	3042139.91639-75.23472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			4/20/1976		39.91639	-75.23472
527	30414	3041439.91222-75.19972	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1903		39.91222	-75.19972
528	30404	3040439.90833-75.23194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/2/1946		39.90833	-75.23194
529	30402	3040239.90806-75.18056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/11/1942		39.90806	-75.18056
530	30402	3040239.90806-75.18056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/11/1942		39.90806	-75.18056
531	30402	3040239.90806-75.18056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/11/1942		39.90806	-75.18056
532	30402	3040239.90806-75.18056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/11/1942		39.90806	-75.18056
533	30402	3040239.90806-75.18056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/11/1942		39.90806	-75.18056
534	30402	3040239.90806-75.18056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/11/1942		39.90806	-75.18056
535	30400	3040039.90722-75.17722	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/7/1942		39.90722	-75.17722
536	30400	3040039.90722-75.17722	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/7/1942		39.90722	-75.17722
537	30400	3040039.90722-75.17722	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/7/1942		39.90722	-75.17722
538	30399	3039939.90278-75.20194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1946		39.90278	-75.20194
539	30399	3039939.90278-75.20194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1946		39.90278	-75.20194
540	30398	3039839.90278-75.20194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1946		39.90278	-75.20194
541	30398	3039839.90278-75.20194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1946		39.90278	-75.20194
542	30397	3039739.90083-75.18028	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.90083	-75.18028
543	30396	3039639.90028-75.17889	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.90028	-75.17889
544	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
545	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
546	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
547	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
548	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
549	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
550	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
551	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
552	30391	3039139.89667-75.18306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/20/1942		39.89667	-75.18306
553	30376	3037639.88972-75.18556	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			4/21/1942		39.88972	-75.18556
554	30376	3037639.88972-75.18556	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			4/21/1942		39.88972	-75.18556
555	30376	3037639.88972-75.18556	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			4/21/1942		39.88972	-75.18556
556	30374	3037439.88833-75.22083	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88833	-75.22083
557	29937	2993739.94417-75.20667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1923		39.94417	-75.20667
558	29937	2993739.94417-75.20667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1923		39.94417	-75.20667
559	29930	2993039.94222-75.20444	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1914		39.94222	-75.20444
560	29927	2992739.94194-75.20472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.94194	-75.20472
561	29926	2992639.94167-75.20472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.94167	-75.20472
562	29925	2992539.94167-75.2025	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			2/1/1931		39.94167	-75.2025
563	29924	2992439.94167-75.19194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1929		39.94167	-75.19194
564	29920	2992039.94083-75.19139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/19/1938		39.94083	-75.19139
565	29918	2991839.93944-75.19139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/1/1930		39.93944	-75.19139
566	29918	2991839.93944-75.19139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/1/1930		39.93944	-75.19139

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
567	29918	2991839.93944-75.19139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/1/1930		39.93944	-75.19139
568	29918	2991839.93944-75.19139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/1/1930		39.93944	-75.19139
569	29917	2991739.93917-75.185	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/1/1940		39.93917	-75.185
570	29916	2991639.93861-75.18556	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1902		39.93861	-75.18556
571	29915	2991539.93833-75.20389	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			11/25/1949		39.93833	-75.20389
572	29905	2990539.93722-75.20083	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			4/24/1951		39.93722	-75.20083
573	29904	2990439.93694-75.19833	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1934		39.93694	-75.19833
574	29901	2990139.93611-75.20694	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1905		39.93611	-75.20694
575	29900	2990039.93583-75.19056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/3/1940		39.93583	-75.19056
576	29900	2990039.93583-75.19056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/3/1940		39.93583	-75.19056
577	29898	2989839.93556-75.21222	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1902		39.93556	-75.21222
578	29896	2989639.93528-75.2125	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1906		39.93528	-75.2125
579	29895	2989539.935-75.19917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1897		39.935	-75.19917
580	29894	2989439.935-75.18722	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.935	-75.18722
581	29893	2989339.93472-75.18667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1920		39.93472	-75.18667
582	29892	2989239.93444-75.18694	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.93444	-75.18694
583	29886	2988639.93194-75.18639	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1916		39.93194	-75.18639
584	29881	2988139.92944-75.18528	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92944	-75.18528
585	29877	2987739.92722-75.20667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1977		39.92722	-75.20667
586	29876	2987639.92722-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92722	-75.20306
587	29875	2987539.92694-75.205	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/1/1979		39.92694	-75.205
588	29865	2986539.925-75.20667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1921		39.925	-75.20667
589	29865	2986539.925-75.20667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1921		39.925	-75.20667
590	29863	2986339.92472-75.20639	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92472	-75.20639
591	29863	2986339.92472-75.20639	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92472	-75.20639
592	29862	2986239.92472-75.19889	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92472	-75.19889
593	29860	2986039.92444-75.20583	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1933		39.92444	-75.20583
594	29857	2985739.92389-75.20278	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92389	-75.20278
595	29855	2985539.92333-75.21972	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			10/24/1947		39.92333	-75.21972
596	29849	2984939.92167-75.18889	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1906		39.92167	-75.18889
597	29848	2984839.92167-75.18861	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1908		39.92167	-75.18861
598	29845	2984539.92139-75.18889	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1923		39.92139	-75.18889
599	29840	2984039.92083-75.19278	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1930		39.92083	-75.19278
600	29840	2984039.92083-75.19278	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1930		39.92083	-75.19278
601	29832	2983239.92056-75.1925	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1925		39.92056	-75.1925
602	29832	2983239.92056-75.1925	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1925		39.92056	-75.1925
603	29831	2983139.92028-75.19417	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92028	-75.19417
604	29831	2983139.92028-75.19417	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92028	-75.19417
605	29827	2982739.92-75.19333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92	-75.19333
606	29827	2982739.92-75.19333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.92	-75.19333
607	29824	2982439.91944-75.19583	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1937		39.91944	-75.19583
608	29824	2982439.91944-75.19583	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1937		39.91944	-75.19583
609	29815	2981539.915-75.20306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.915	-75.20306
610	29813	2981339.91389-75.20917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/5/1938		39.91389	-75.20917
611	29812	2981239.91361-75.20028	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			<Null>		39.91361	-75.20028
612	29808	2980839.91083-75.19583	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			6/24/1987		39.91083	-75.19583
613	29805	2980539.90972-75.19111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1914		39.90972	-75.19111
614	29803	2980339.90944-75.235	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1918		39.90944	-75.235
615	29802	2980239.90944-75.19917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/27/1987		39.90944	-75.19917
616	29801	2980139.90944-75.19861	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/28/1987		39.90944	-75.19861
617	29791	2979139.90861-75.2125	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/1/1936		39.90861	-75.2125
618	29789	2978939.90806-75.20917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			10/1/1936		39.90806	-75.20917
619	29788	2978839.90806-75.19667	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1915		39.90806	-75.19667
620	29781	2978139.90667-75.21222	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/1/1936		39.90667	-75.21222
621	29779	2977939.90611-75.20833	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1936		39.90611	-75.20833
622	29778	2977839.90444-75.21278	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1936		39.90444	-75.21278
623	29777	2977739.90417-75.20944	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/1/1936		39.90417	-75.20944
624	29775	2977539.90278-75.20194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/1/1936		39.90278	-75.20194
625	29775	2977539.90278-75.20194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			8/1/1936		39.90278	-75.20194
626	29773	2977339.9025-75.20889	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/1/1936		39.9025	-75.20889
627	29772	2977239.9025-75.20056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/26/1940		39.9025	-75.20056
628	29772	2977239.9025-75.20056	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			12/26/1940		39.9025	-75.20056
629	29771	2977139.90222-75.17778	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.90222	-75.17778

Table M.1

Well Search Results
Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	PAWellID		Shape *	County	Municipali	QuadName	WellAddres	WellZipCod	DateDrille	TypeOfActi	LatitudeDD	LongitudeD
630	29769	2976939.90111-75.17806	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1919		39.90111	-75.17806
631	29768	2976839.90056-75.17833	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1952		39.90056	-75.17833
632	29766	2976639.89694-75.19833	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1906		39.89694	-75.19833
633	29763	2976339.89611-75.21417	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1984		39.89611	-75.21417
634	29758	2975839.89528-75.19167	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			5/1/1942		39.89528	-75.19167
635	29756	2975639.89222-75.2225	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1984		39.89222	-75.2225
636	29755	2975539.89222-75.2225	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1984		39.89222	-75.2225
637	29753	2975339.89111-75.22306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			10/1/1981		39.89111	-75.22306
638	29751	2975139.89083-75.22333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			10/1/1981		39.89083	-75.22333
639	29750	2975039.89083-75.22306	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			10/1/1981		39.89083	-75.22306
640	29749	2974939.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
641	29749	2974939.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
642	29749	2974939.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
643	29749	2974939.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
644	29748	2974839.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
645	29748	2974839.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
646	29748	2974839.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
647	29748	2974839.89083-75.22111	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.89083	-75.22111
648	29746	2974639.89056-75.22333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			10/1/1981		39.89056	-75.22333
649	29745	2974539.89-75.22583	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1918		39.89	-75.22583
650	29744	2974439.88972-75.22194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88972	-75.22194
651	29743	2974339.88972-75.22167	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88972	-75.22167
652	29742	2974239.88944-75.22222	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88944	-75.22222
653	29741	2974139.88917-75.22194	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88917	-75.22194
654	29740	2974039.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
655	29740	2974039.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
656	29740	2974039.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
657	29740	2974039.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
658	29739	2973939.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
659	29739	2973939.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
660	29739	2973939.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
661	29739	2973939.88889-75.2175	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88889	-75.2175
662	29738	2973839.88861-75.22139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88861	-75.22139
663	29737	2973739.88861-75.22083	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88861	-75.22083
664	29736	2973639.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
665	29736	2973639.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
666	29736	2973639.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
667	29736	2973639.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
668	29735	2973539.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
669	29735	2973539.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
670	29735	2973539.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
671	29735	2973539.88861-75.21917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88861	-75.21917
672	29734	2973439.88833-75.22139	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			3/1/1980		39.88833	-75.22139
673	29733	2973339.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
674	29733	2973339.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
675	29733	2973339.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
676	29733	2973339.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
677	29732	2973239.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
678	29732	2973239.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
679	29732	2973239.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
680	29732	2973239.88694-75.21333	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1981		39.88694	-75.21333
681	29731	2973139.88611-75.19722	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/1/1944		39.88611	-75.19722
682	29730	2973039.88417-75.21222	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			9/8/1981		39.88417	-75.21222
683	29729	2972939.88389-75.21472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1984		39.88389	-75.21472
684	29728	2972839.88389-75.21472	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			1/1/1984		39.88389	-75.21472
685	136068	13606839.93917-75.19917	Point	PHILADELPHIA	PHILADELPHIA	PHILADELPHIA			7/30/1974	NEW WELL	39.93917	-75.19917

Table M.1

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Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
0	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	35	0	16	4		FALSE				
1	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	35	16	18	4		FALSE				
2	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	60	0	36	4		FALSE				
3	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	60	36	38	4		FALSE				
4	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	70	0	55	4		FALSE				
5	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	70	55	58	4		FALSE				
6	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	45	0	21	4		FALSE				
7	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	45	21	23	4		FALSE				
8	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	39	0	20	4		FALSE				
9	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	39	20	22	4		FALSE				
10	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	90	75	78	2		FALSE				
11	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	90	0	75	2		FALSE				
12	PARRATT-WOLFF INC	Evergreen Resources Group		OTHER	45	0	25.5	4		FALSE				
13	PARRATT-WOLFF INC	Evergreen Resources Group		OTHER	45	25.5	28	4		FALSE				
14	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	40	0	21	4		FALSE				
15	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	40	21	23	4		FALSE				
16	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	15	0	2	4		FALSE				
17	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	15	2	4	4		FALSE				
18	EAST COAST DRILLING INC	Gas Works	MONITORING	OTHER	33	0	13	2		TRUE	1	23		60
19	EAST COAST DRILLING INC	Gas Works	MONITORING	OTHER	35	0	15	2		TRUE	1	22		60
20	EAST COAST DRILLING INC	Gas Works	MONITORING	OTHER	34	0	14	2		TRUE	1	25		60
21	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	66	0	51	4		TRUE		8		
22	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	66	51	54	4		TRUE		8		
23	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	65	0	50	4		TRUE		12		
24	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	65	50	53	4		TRUE		12		
25	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	80.3	0	67	4		TRUE		14		
26	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	80.3	67	70	4		TRUE		14		
27	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	14	0	1	4		TRUE		10		
28	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	14	1	8	4		TRUE		10		
29	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	33	0	1	4		TRUE				
30	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	33	1	22	4		TRUE				
31	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	16	0	1	4		TRUE		10		
32	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	16	1	6	4		TRUE		10		
33	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	25	0	1	4		FALSE				
34	PARRATT-WOLFF INC	Evergreen Resources Group LLC		OTHER	25	1	6	4		FALSE				
35	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	25	1	8	4		TRUE		8		
36	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	25	0	1	4		TRUE		8		
37	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	37	14	18	4		TRUE		23		
38	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	37	0	1	4		TRUE		23		
39	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	OTHER	37	1	14	4		TRUE		23		
40	ALLIED WELL DRILLING	Septa	MONITORING	OTHER	28.5	0	13.5	2		FALSE				
41	ALLIED WELL DRILLING	Septa	MONITORING	OTHER	24	0	9	2		FALSE				
42	ALLIED WELL DRILLING	Septa	MONITORING	OTHER	29	0	14	2		FALSE				
43	ALLIED WELL DRILLING	Septa	MONITORING	OTHER	24	0	14	2		FALSE				
44	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	14	0	0	0		FALSE				
45	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	16	0	0	0		FALSE				
46	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
47	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
48	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
49	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
50	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	15	0	0	0		FALSE				
51	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	14	0	0	0		FALSE				
52	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	15	0	0	0		FALSE				
53	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	11	0	0	0		FALSE				
54	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	15	0	0	0		FALSE				
55	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	29	0	0	0		FALSE				
56	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	11	0	0	0		FALSE				
57	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
58	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	16	0	0	0		FALSE				
59	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	13	0	0	0		FALSE				
60	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	16	0	0	0		FALSE				
61	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
62	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	31	0	0	0		FALSE				

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Remedial Investigation Report
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
63	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
64	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	14	0	0	0		FALSE				
65	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	15	0	0	0		FALSE				
66	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
67	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	11	0	0	0		FALSE				
68	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	14	0	0	0		FALSE				
69	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	11	0	0	0		FALSE				
70	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
71	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	10	0	0	0		FALSE				
72	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
73	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
74	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	16	0	0	0		FALSE				
75	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	12	0	0	0		FALSE				
76	PARRATT-WOLFF INC	Evergreen	MONITORING	OTHER	96	81	84	4		FALSE				
77	PARRATT-WOLFF INC	Evergreen	MONITORING	OTHER	96	0	81	4		FALSE				
78	PARRATT-WOLFF INC	Evergreen	MONITORING	OTHER	96	84	86	4		FALSE				
79	PARRATT-WOLFF INC	Evergreen	MONITORING	OTHER	132	0	115	4		FALSE				
80	PARRATT-WOLFF INC	Evergreen	MONITORING	OTHER	132	115	119	4		FALSE				
81	PARRATT-WOLFF INC	Evergreen	MONITORING	OTHER	132	119	122	4		FALSE				
82	ALLIED WELL DRILLING	121 Point Breeze Terminal	ABANDONED	OTHER	13	0	0	0		FALSE				
83	CHRISTROPHER C W COOK FOUNDATION INC.	City of Phila	UNUSED	UNUSED	505	0	0	0	146	FALSE				
84	EICHELBERGERS INC.	SUNOCO	OBSERVATION	UNUSED	30	0	5	4		TRUE				
85	EICHELBERGERS INC.	SUNOCO	OBSERVATION	UNUSED	30	0	5	4		TRUE				
86	EICHELBERGERS INC.	SUNOCO	OBSERVATION	UNUSED	30	0	5	4		TRUE				
87	ALLIED WELL DRILLING	Delaware Ave Enterprises Inc	MONITORING	OTHER	35	0	5	2		FALSE				
88	ALLIED WELL DRILLING	Delaware Ave Enterprises Inc	MONITORING	OTHER	35	0	5	2		FALSE				
89	ALLIED WELL DRILLING	Delaware Ave Enterprises Inc	MONITORING	OTHER	38	0	3	2		FALSE				
90	EICHELBERGERS INC.	EXXON/MOBIL	OBSERVATION	UNUSED	30	0	10	4		TRUE				
91	EICHELBERGERS INC.	EXXON/MOBIL	OBSERVATION	UNUSED	30	0	10	4		TRUE				
92	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	2		TRUE				
93	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	2		TRUE				
94	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	2		TRUE				
95	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	4		TRUE				
96	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	2		TRUE				
97	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	2		TRUE				
98	EICHELBERGERS INC.	ESSINGTON PATRIOT L.P.	OBSERVATION	UNUSED	15	0	10	2		TRUE				
99	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	15	0	4	4		FALSE				
100	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	35	0	15	6		FALSE				
101	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	34	0	14	4		FALSE				
102	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	60	0	40	4		FALSE				
103	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	20	0	5	4		FALSE				
104	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	80	0	60	4		FALSE				
105	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	60	0	40	4		FALSE				
106	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	35	0	15	6		FALSE				
107	PARRATT-WOLFF INC	Evergreen Resources Group LLC	MONITORING	UNKNOWN	34	0	14	6		FALSE				
108	ODYSSEY ENVIRONMENTAL SERVICES INC.	Philadelphia Authority for Industrial Development	MONITORING	UNKNOWN	26.5	0	16.5	2		FALSE				
109	ODYSSEY ENVIRONMENTAL SERVICES INC.	Philadelphia Authority for Industrial Development	MONITORING	UNKNOWN	25	0	15	2		FALSE				
110	ODYSSEY ENVIRONMENTAL SERVICES INC.	Philadelphia Authority for Industrial Development	MONITORING	UNKNOWN	25	0	15	2		FALSE				
111	ODYSSEY ENVIRONMENTAL SERVICES INC.	Philadelphia Authority for Industrial Development	MONITORING	UNKNOWN	27.5	0	17.5	2		FALSE				
112	ODYSSEY ENVIRONMENTAL SERVICES INC.	Philadelphia Authority for Industrial Development	MONITORING	UNKNOWN	30	0	20	2		FALSE				
113	EICHELBERGERS INC.	MEISSNER CHEVROLET	OBSERVATION	UNUSED	20	0	10	2		FALSE				
114	EICHELBERGERS INC.	MEISSNER CHEVROLET	OBSERVATION	UNUSED	20	0	10	2		FALSE				
115	EICHELBERGERS INC.	MEISSNER CHEVROLET	OBSERVATION	UNUSED	20	0	10	2		FALSE				
116	EICHELBERGERS INC.	MEISSNER CHEVROLET	OBSERVATION	UNUSED	20	0	10	2		FALSE				
117	EICHELBERGERS INC.	MEISSNER CHEVROLET	OBSERVATION	UNUSED	20	0	10	2		FALSE				
118	EAST COAST DRILLING INC	Gas Works		UNUSED	20	0	15	2		TRUE		0		
119	EAST COAST DRILLING INC	Gas Works		UNUSED	20	0	15	2		TRUE		0		
120	EAST COAST DRILLING INC	Gas Works		UNUSED	20	0	15	2		TRUE		0		
121	EAST COAST DRILLING INC	Gas Works		UNUSED	21	0	16	2		TRUE		0		
122	EAST COAST DRILLING INC	Gas Works		UNUSED	19	0	14	2		TRUE		0		
123	EAST COAST DRILLING INC	Gas Works		UNUSED	31	0	28	2		TRUE	1	20		30
124	EAST COAST DRILLING INC	Gas Works		UNUSED	33.5	0	30.5	2		TRUE	0.5	20		60
125	EAST COAST DRILLING INC	Gas Works		UNUSED	21	0	16	2		TRUE		0		

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
126	EAST COAST DRILLING INC	Gas Works		UNUSED	22	0	17	2		TRUE		0		
127	EAST COAST DRILLING INC	Gas Works		UNUSED	33.5	0	30.5	2		TRUE	0.5	21		60
128	EAST COAST DRILLING INC	Gas Works		UNUSED	33.5	0	30.5	2		TRUE	0.5	20		60
129	EAST COAST DRILLING INC	Gas Works		UNUSED	32	0	29	2		TRUE	0.5	20		60
130	EAST COAST DRILLING INC	Gas Works		UNUSED	34	0	31	2		TRUE	0.5	21		60
131	EAST COAST DRILLING INC	Gas Works		UNUSED	18.5	0	13.5	2		TRUE		0		
132	EAST COAST DRILLING INC	Gas Works		UNUSED	20	0	15	2		TRUE		0		
133	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
134	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
135	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
136	EAST COAST DRILLING INC	Gas Works		UNUSED	34	0	31	2		TRUE	1.5	20		30
137	EAST COAST DRILLING INC	Gas Works		UNUSED	33.5	0	30.5	2		TRUE	0.5	20		60
138	EAST COAST DRILLING INC	Gas Works		UNUSED	34	0	31	2		TRUE	0.5	20		60
139	EAST COAST DRILLING INC	Gas Works		UNUSED	34	0	31	2		TRUE	0.5	20		60
140	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
141	EAST COAST DRILLING INC	Gas Works		UNUSED	34	0	31	2		TRUE	1.5	20		30
142	EAST COAST DRILLING INC	Gas Works		UNUSED	31	0	28	2		TRUE	1	20		30
143	EAST COAST DRILLING INC	Gas Works		UNUSED	31	0	28	2		TRUE	1	20		30
144	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	1.5	20		30
145	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	1	20		40
146	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
147	EAST COAST DRILLING INC	Gas Works		UNUSED	31.5	0	28.5	2		TRUE	1			30
148	EAST COAST DRILLING INC	Gas Works		UNUSED	30	0	27	2		TRUE	1	20		30
149	EAST COAST DRILLING INC	Gas Works		UNUSED	30.5	0	27.5	2		TRUE	1.5	20		30
150	EAST COAST DRILLING INC	Gas Works		UNUSED	32	0	29	2		TRUE	1.5	20		30
151	EAST COAST DRILLING INC	Gas Works		UNUSED	32	0	29	2		TRUE	1	20		30
152	EAST COAST DRILLING INC	Gas Works		UNUSED	35	0	32	2		TRUE	1	20		40
153	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	1	20		50
154	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
155	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
156	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
157	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
158	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
159	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
160	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
161	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
162	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	0.5	20		60
163	EAST COAST DRILLING INC	Philadelphia		UNUSED	31	0	28	2		TRUE	1			30
164	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	1.5	20		30
165	EAST COAST DRILLING INC	Gas Works		UNUSED	33	0	30	2		TRUE	1.5	20		30
166	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	25	0	0	0		FALSE				
167	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	27	0	0	0		FALSE				
168	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	14	0	0	0		FALSE				
169	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	20	0	0	0		FALSE				
170	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	16	0	0	0		FALSE				
171	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	12	0	0	0		FALSE				
172	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	16	0	0	0		FALSE				
173	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	17	0	0	0		FALSE				
174	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	15	0	0	0		FALSE				
175	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	22	0	0	0		FALSE				
176	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	20	0	0	0		FALSE				
177	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	18	0	0	0		FALSE				
178	EICHELBERGERS INC.	US NAVY	ABANDONED	UNUSED	18	0	0	0		FALSE				
179	EICHELBERGERS INC.	SUN COMPANY INC.	OBSERVATION	UNUSED	25	0	5	4		TRUE				
180	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
181	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
182	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	4		FALSE				
183	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
184	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
185	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
186	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
187	EICHELBERGERS INC.	UNITED AIRLINES	OBSERVATION	UNUSED	15	0	5	2		TRUE				
188	EICHELBERGERS INC.	UNITED AIRLINES	OBSERVATION	UNUSED	20	0	5	2		TRUE				

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
189	EICHELBERGERS INC.	UNITED AIRLINES	OBSERVATION	UNUSED	15	0	5	2		TRUE				
190	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
191	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	6		FALSE				
192	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	30	0	10	4		FALSE				
193	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	4		FALSE				
194	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	4		FALSE				
195	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	35	0	15	4		FALSE				
196	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	89	0	79	4		FALSE				
197	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	44	0	39	4		FALSE				
198	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	45	0	35	4		FALSE				
199	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	102	0	92	4		FALSE				
200	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	72	0	62	4		FALSE				
201	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	98	0	88	4		FALSE				
202	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	92	0	82	4		FALSE				
203	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	55	0	50	4		FALSE				
204	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	74	0	69	4		FALSE				
205	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	45	0	40	4		FALSE				
206	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	54	0	49	4		FALSE				
207	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	57	0	52	4		FALSE				
208	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	80	0	70	4		FALSE				
209	PARRATT-WOLFF INC	Evergreen Resource Management	MONITORING	OTHER	82	0	72	4		FALSE				
210	SUBSURFACE ENVIRONMENTAL TECHNOLOGIES LL	Eckelmeyer	WITHDRAWAL	UNKNOWN	27	0	17	2		FALSE	2	21		30
211	ODYSSEY ENVIRONMENTAL SERVICES INC.	Sunoco Inc. (R&M)	MONITORING	UNKNOWN	25	0	0	0		FALSE				
212	ODYSSEY ENVIRONMENTAL SERVICES INC.	Sunoco Inc. (R&M)	MONITORING	UNKNOWN	25	0	0	0		FALSE				
213	ODYSSEY ENVIRONMENTAL SERVICES INC.	Sunoco Inc. (R&M)	MONITORING	UNKNOWN	25	0	0	0		FALSE				
214	ODYSSEY ENVIRONMENTAL SERVICES INC.	Sunoco Inc. (R&M)	MONITORING	UNKNOWN	23	0	0	0		FALSE				
215	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	30	0	30	2		FALSE				
216	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	30	0	30	4		FALSE				
217	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	22	0	22	2		FALSE				
218	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	17	0	17	2		FALSE				
219	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	17	0	17	2		FALSE				
220	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	25	0	25	2		FALSE				
221	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	35	0	35	2		FALSE				
222	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	22	0	22	4		FALSE				
223	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	30	0	30	4		FALSE				
224	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	27	0	27	2		FALSE				
225	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	26	0	26	2		FALSE				
226	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	26	0	26	2		FALSE				
227	ALLIED WELL DRILLING	Danbro L.P.	MONITORING	UNKNOWN	32	0	32	4		FALSE				
228	A LEXANDER MACPHEE--CVM INDUSTRIES	Woodland Gulf	UNUSED	UNUSED	24	0	9	2	12	FALSE	1	12	12	
229	A LEXANDER MACPHEE--CVM INDUSTRIES	Woodland Gulf	UNUSED	UNUSED	23	0	8	2	11	FALSE	1	12	12	
230	A LEXANDER MACPHEE--CVM INDUSTRIES	Woodland Gulf	UNUSED	UNUSED	24	0	9	2	11	FALSE	1	11	11	
231	A LEXANDER MACPHEE--CVM INDUSTRIES	Woodland Gulf	TEST	UNUSED	23	0	8	2	22	FALSE		12	12	
232	A LEXANDER MACPHEE--CVM INDUSTRIES	Woodland Gulf	TEST	UNUSED	23	0	8	2	13	FALSE	1	11	11	
233	TPI ENVIRONMENTAL INC.	Geosyntec Consultants	WITHDRAWAL	UNKNOWN	20	0	10	2		FALSE				
234	AMERIDRILL INC.	Philadelphia Industrial Development Corp.	MONITORING	UNKNOWN	15	0	5	4		TRUE				
235	AMERIDRILL INC.	Defense Logistics Agency	MONITORING	UNKNOWN	45	0	15	4		TRUE				
236	ENVIRONMENTAL FIELD SERVICE INC	Pacific Atlantic Terminals LLC	MONITORING	UNUSED	15	0	0	0		TRUE		4		
237	ENVIRONMENTAL FIELD SERVICE INC	Pacific Atlantic Terminals LLC	MONITORING	UNUSED	15	0	0	0		TRUE		4		
238	ENVIRONMENTAL FIELD SERVICE INC	Pacific Atlantic Terminals LLC	MONITORING	UNUSED	14.5	0	0	0		TRUE		4		
239	ODYSSEY ENVIRONMENTAL SERVICES INC.	Saini	MONITORING	UNKNOWN	25	0	5	2		TRUE				
240	ODYSSEY ENVIRONMENTAL SERVICES INC.	Saini	WITHDRAWAL	UNKNOWN	25	0	5	2		TRUE				
241	ODYSSEY ENVIRONMENTAL SERVICES INC.	Saini	MONITORING	UNKNOWN	25	0	5	2		TRUE				
242	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
243	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
244	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
245	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
246	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
247	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
248	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
249	ODYSSEY ENVIRONMENTAL SERVICES INC.	City of Philadelphia	MONITORING	UNKNOWN	20	0	0	0		FALSE				
250	ODYSSEY ENVIRONMENTAL SERVICES INC.	Saini	MONITORING	UNKNOWN	30	0	5	2		TRUE				
251	ODYSSEY ENVIRONMENTAL SERVICES INC.	Saini	MONITORING	UNKNOWN	30	0	5	2		TRUE				

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
252	B L MYERS BROS. OF PA. INC.	Point Breeze Terminal	MONITORING	UNKNOWN	15	0	0	0		FALSE				
253	B L MYERS BROS. OF PA. INC.	Point Breeze Terminal	MONITORING	UNKNOWN	15	0	3	4		FALSE				
254	THOMAS G KEYES INC	Auto Parts	WITHDRAWAL	INDUSTRIAL	182	0	101	6	90	FALSE	20	15	75	120
255	TALON DRILLING COMPANY	Singh	MONITORING	UNKNOWN	20	0	5	4		TRUE				
256	TALON DRILLING COMPANY	Singh	MONITORING	UNKNOWN	20	0	5	4		TRUE				
257	TALON DRILLING COMPANY	Singh	MONITORING	UNKNOWN	20	0	5	4		TRUE				
258	TALON DRILLING COMPANY	Singh	MONITORING	UNKNOWN	20	0	5	4		TRUE				
259	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	26	0	11	4		FALSE		16		
260	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	18	0	8	4		FALSE		8		
261	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	12	0	4	4		FALSE		2		
262	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	3		FALSE		4		
263	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		20		
264	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		20		
265	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		21		
266	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		22		
267	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		21		
268	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	34	0	19	4		FALSE		23		
269	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	26	0	11	4		FALSE		16		
270	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	4		FALSE		8		
271	C S GARBER & SONS INC	PHILADELPHIA V.A. HOSPITAL	MONITORING	UNKNOWN	30	0	5	2	5	FALSE	0.1	13		
272	C S GARBER & SONS INC	PHILADELPHIA V.A. HOSPITAL	MONITORING	UNKNOWN	30	0	0	0	5	FALSE	0.1	13		
273	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
274	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	38	0	0	0		FALSE				
275	PARRATT-WOLFF INC	SAIC	MONITORING	UNKNOWN	33	0	23	2		TRUE		23		
276	PARRATT-WOLFF INC	SAIC	MONITORING	UNKNOWN	23	0	13	2		TRUE		15		
277	PARRATT-WOLFF INC	SAIC	MONITORING	UNKNOWN	34	0	24	2		TRUE		28		
278	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	36	0	0	0		FALSE				
279	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
280	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
281	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
282	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
283	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
284	PARRATT-WOLFF INC	SAIC	MONITORING	UNKNOWN	33	0	23	2		TRUE		25		
285	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	35	0	0	0		FALSE				
286	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	55	0	0	0		FALSE				
287	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	45	0	0	0		FALSE				
288	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	48	0	0	0		FALSE				
289	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
290	ODYSSEY ENVIRONMENTAL SERVICES INC.	BP	MONITORING	UNKNOWN	28	0	0	0		FALSE				
291	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	30	0	10	2		TRUE				
292	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	25	0	5	2		TRUE				
293	PARRATT-WOLFF INC	ARCO	MONITORING	UNKNOWN	39	0	19	4		TRUE		24		
294	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	30	0	10	2		TRUE				
295	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	20	0	3	2		TRUE				
296	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	25	0	5	2		TRUE				
297	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	30	0	10	2		TRUE				
298	PARRATT-WOLFF INC	ARCO	MONITORING	UNKNOWN	40	0	20	4		TRUE				
299	PARRATT-WOLFF INC	ARCO	MONITORING	UNKNOWN	75	0	65	4		TRUE				
300	PARRATT-WOLFF INC	ARCO	MONITORING	UNKNOWN	75	0	44	6		TRUE				
301	PARRATT-WOLFF INC	ARCO	MONITORING	UNKNOWN	40	0	20	4		TRUE		24		
302	B L MYERS BROS. OF PA. INC.	United Gas	MONITORING	UNKNOWN	20	0	5	4		FALSE				
303	B L MYERS BROS. OF PA. INC.	United Gas	MONITORING	UNKNOWN	20	0	5	4		FALSE				
304	B L MYERS BROS. OF PA. INC.	United Gas	MONITORING	UNKNOWN	20	0	5	4		FALSE				
305	B L MYERS BROS. OF PA. INC.	United Gas	MONITORING	UNKNOWN	20	0	5	4		FALSE				
306	ENVIRONMENTAL PROBING INVESTIGATIONS INC	Oil Terminal	MONITORING	INDUSTRIAL	30	0	10	4		TRUE	1	11		30
307	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	77	0	57	4		TRUE				
308	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	77	57	63	4		TRUE				
309	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	77	63	67	4		TRUE				
310	C S GARBER & SONS INC	ESSINGTON AVENUE PARTNERS II L.P.	ABANDONED	UNKNOWN	46	0	0	0		FALSE		42		
311	C S GARBER & SONS INC	ESSINGTON AVENUE PARTNERS II L.P.	ABANDONED	UNKNOWN	29	0	0	0		FALSE		15		
312	C S GARBER & SONS INC	ESSINGTON AVENUE PARTNERS II L.P.	ABANDONED	UNKNOWN	30	0	0	0		FALSE		24		
313	C S GARBER & SONS INC	ESSINGTON AVENUE PARTNERS II L.P.	ABANDONED	UNKNOWN	24	0	0	0		FALSE		12		
314	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	13	2	3	4		FALSE				

Table M.1

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
315	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	14	2	4	4		FALSE				
316	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	15	0	5	4		FALSE				
317	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	53	0	37	4		FALSE				
318	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	53	37	39	4		FALSE				
319	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	53	39	41	4		FALSE				
320	C S GARBER & SONS INC	PHILADELPHIA V.A. HOSPITAL	MONITORING	UNKNOWN	30	0	0	0	7	FALSE	0.1	7		
321	C S GARBER & SONS INC	PHILADELPHIA V.A. HOSPITAL	MONITORING	UNKNOWN	30	0	5	2	7	FALSE	0.1	7		
322	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	36	0	0	0		FALSE				
323	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	36	0	0	0		FALSE				
324	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	16	0	6	4		FALSE				
325	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	14	0	4	10		FALSE				
326	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	13	2	3	4		FALSE				
327	PARRATT-WOLFF INC	Sunoco	MONITORING	UNKNOWN	14	2	4	4		FALSE				
328	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
329	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	38	0	0	0		FALSE				
330	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	38	0	0	0		FALSE				
331	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	38	0	0	0		FALSE				
332	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
333	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	38	0	0	0		FALSE				
334	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40.5	0	0	0		FALSE				
335	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
336	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
337	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
338	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
339	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
340	C S GARBER & SONS INC	ESSINGTON AVENUE PARTNERS II L.P.	ABANDONED	UNKNOWN	25	0	0	0		FALSE		15		
341	C S GARBER & SONS INC	ESSINGTON AVENUE PARTNERS II L.P.	ABANDONED	UNKNOWN	20	0	0	0		FALSE		7		
342	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	15	0	0	0		FALSE	1	5	16	168
343	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	25	0	0	0		FALSE	9	12	20	168
344	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	29	0	0	0		FALSE	0.5	15	24	168
345	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	29	0	0	0		FALSE	2.3	15	24	168
346	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	29	0	0	0		FALSE	0.4	15	24	168
347	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	26	0	0	0		FALSE	0.8	15	24	168
348	B L MYERS BROS. OF PA. INC.	Pacific Atlantic Terminal LLC	MONITORING	UNKNOWN	6	0	0	0		FALSE				
349	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	28	0	13	6		FALSE	0.1	15	24	168
350	B L MYERS BROS. OF PA. INC.	Pacific Atlantic Terminal LLC	MONITORING	OTHER	26	0	0	0		FALSE				
351	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	28	0	13	6		FALSE	0.8	15	24	168
352	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	31	0	0	0		FALSE	0.5	15	24	
353	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	28	0	13	6		FALSE	0.5	15	24	168
354	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	31	0	0	0		FALSE	1.7	15	24	168
355		SUN COMPANY	WITHDRAWAL	OTHER	0	0	0	0		FALSE	10	9	14	168
356		SUN COMPANY	WITHDRAWAL	OTHER	0	0	0	0		FALSE	5	22	25	168
357	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	50	0	0	0		FALSE	6.5	22	27	168
358	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	37	0	0	0		FALSE	1.8	22	29	168
359	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	35	0	0	0		FALSE	2	22	27	168
360	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	35	0	0	0		FALSE	7.5	22	27	168
361	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	34	0	0	0		FALSE	1	22	29	168
362		SUN COMPANY	WITHDRAWAL	OTHER	0	0	0	0		FALSE	20	5	10	168
363	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	37	0	0	0		FALSE	0.1	25	32	168
364	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	50	0	0	0		FALSE	2	22	30	168
365	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	33	0	0	0		FALSE	0.9	22	30	168
366	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	49	0	0	0		FALSE	1.1	22	30	168
367	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	32	0	22	6		FALSE	0.1	24	30	168
368	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	36	0	26	6		FALSE	0.3	24	26	168
369	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	18	0	0	0		FALSE	3.5	8	15	168
370	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	28	0	0	0		FALSE	0.5	18	24	168
371	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	18	0	8	6		FALSE	0.4	8	15	168
372	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	29	0	0	0		FALSE	3	18	24	168
373	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	27	0	0	0		FALSE	1	18	24	168
374	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	31	0	0	0		FALSE	1.6	18	24	168
375	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	18	0	0	0		FALSE	0.3	10	15	168
376	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	18	0	0	0		FALSE	0.1	10	15	168
377	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
378	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
379	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
380	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
381	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
382	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
383	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
384	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	44	0	0	0		FALSE				
385	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
386	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	42	0	0	0		FALSE				
387	PARRATT-WOLFF INC	SUNOCO	INJECTION	UNKNOWN	40	0	0	0		FALSE				
388	B L MYERS BROS. OF PA. INC.	121 Point Breeze Terminal	MONITORING	OTHER	15	0	5	2		FALSE				
389	EMPIRE SOILS INVESTIGATIONS INC	SUN COMPANY	OBSERVATION	UNUSED	85	0	75	2		FALSE				
390	EMPIRE SOILS INVESTIGATIONS INC	SUN COMPANY	OBSERVATION	UNUSED	99	0	89	2		FALSE				
391	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	18	0	8	6		FALSE	0.2	8	15	168
392	UNKNOWN	SUN COMPANY	WITHDRAWAL	OTHER	18	0	8	6		FALSE	4	8	15	168
393	EMPIRE SOILS INVESTIGATIONS INC	SUN COMPANY	OBSERVATION	UNUSED	64	0	54	2		FALSE				
394	EMPIRE SOILS INVESTIGATIONS INC	SUN COMPANY	OBSERVATION	UNUSED	130	0	120	2		FALSE				
395	CHESAPEAKE GEOSYSTEMS INC.	PHILA DEPT OF AVIATION	OBSERVATION	UNUSED	114	0	55	8		FALSE	6			
396	CHESAPEAKE GEOSYSTEMS INC.	PHILA DEPT OF AVIATION	OBSERVATION	UNUSED	114	0	102	4		FALSE	6			
397	CHESAPEAKE GEOSYSTEMS INC.	PHILA DEPT OF AVIATION	OBSERVATION	UNUSED	114	0	14	12		FALSE	6			
398	CHESAPEAKE GEOSYSTEMS INC.	PHILA DEPT OF AVIATION	OBSERVATION	UNUSED	128	0	78	8		FALSE	6			
399	CHESAPEAKE GEOSYSTEMS INC.	PHILA DEPT OF AVIATION	OBSERVATION	UNUSED	128	0	116	4		FALSE	6			
400	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		20		
401	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	26	0	11	4		FALSE		16		
402	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		20		
403	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	32	0	17	4		FALSE		18		
404	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		21		
405	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	25	0	10	4		FALSE		14		
406	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	20	0	5	4		FALSE		10		
407	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	40	0	25	4		FALSE		31		
408	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	20	0	10	4		FALSE		10		
409	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	24	0	9	4		FALSE		13		
410	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	25	0	10	4		FALSE		15		
411	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	4		FALSE		8		
412	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	11	0	1	4		FALSE		1		
413	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	4		FALSE		4		
414	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	4		FALSE		4		
415	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	4		FALSE				
416	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	15	0	5	4		FALSE		5		
417	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	6	4		FALSE		7		
418	ENVIRONMENTAL PROBING INVESTIGATIONS INC	Oil	MONITORING	INDUSTRIAL	26	0	1	4		TRUE	1	1		60
419	B L MYERS BROS. OF PA. INC.	Essington Ave Partners II L.P.	MONITORING	OTHER	30	0	10	2		FALSE				
420	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		20		
421	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	30	0	15	4		FALSE		30		
422	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	36	0	21	4		FALSE		24		
423	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	26	0	11	4		FALSE		16		
424	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	16	0	6	4		FALSE		6		
425	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	20	0	5	4		FALSE		8		
426	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	12	0	2	4		FALSE		2		
427	PARRATT-WOLFF INC	SUNOCO	MONITORING	UNKNOWN	14	0	4	4		FALSE		4		
428	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	35	0	0	0		FALSE				
429	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	35	0	0	0		FALSE				
430	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	35	0	0	0		FALSE				
431	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	30	0	0	0		FALSE				
432	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	35	0	0	0		FALSE				
433	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	35	0	0	0		FALSE				
434	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	30	0	0	0		FALSE				
435	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	36	0	0	0		FALSE				
436	C S GARBER & SONS INC	PHILADELPHIA V.A. HOSPITAL	MONITORING	UNKNOWN	30	0	0	0	9	FALSE	0.75	22		
437	C S GARBER & SONS INC	PHILADELPHIA V.A. HOSPITAL	MONITORING	UNKNOWN	30	0	5	2	9	FALSE	0.75	22		
438	ODYSSEY ENVIRONMENTAL SERVICES INC.	M A Bruder & Sons	MONITORING	UNKNOWN	33	0	0	0		FALSE				
439	ODYSSEY ENVIRONMENTAL SERVICES INC.	M A Bruder & Sons	MONITORING	UNKNOWN	26	0	0	0		FALSE				
440	ODYSSEY ENVIRONMENTAL SERVICES INC.	M A Bruder & Sons	MONITORING	UNKNOWN	15	0	0	0		FALSE				

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
441	ODYSSEY ENVIRONMENTAL SERVICES INC.	M A Bruder & Sons	MONITORING	UNKNOWN	40	0	0	0		FALSE				
442	B L MYERS BROS. OF PA. INC.	The Grays Ferry Shopping Center	MONITORING	UNKNOWN	36	0	16	2		FALSE				
443	B L MYERS BROS. OF PA. INC.	The Grays Ferry Shopping Center	MONITORING	UNKNOWN	35	0	20	2		FALSE				
444	ODYSSEY ENVIRONMENTAL SERVICES INC.	M A Bruder & Sons	MONITORING	UNKNOWN	31	0	0	0		FALSE				
445	B L MYERS BROS. OF PA. INC.	Former Bill's Auto	MONITORING	UNKNOWN	20	0	10	2		FALSE				
446	PARRATT-WOLFF INC	SAIC	MONITORING	UNKNOWN	33	0	23	2		TRUE		22		
447	PARRATT-WOLFF INC	SAIC	MONITORING	UNKNOWN	33	0	23	2		TRUE		22		
448	EICHELBERGERS INC.	VERIZON- PHILA	WITHDRAWAL	UNUSED	33	0	30	2		TRUE				
449	EICHELBERGERS INC.	VERIZON- PHILA	WITHDRAWAL	UNUSED	33	0	30	2		TRUE				
450	EICHELBERGERS INC.	VERIZON- PHILA	WITHDRAWAL	UNUSED	33	0	30	2		TRUE				
451	EICHELBERGERS INC.	VERIZON- PHILA	WITHDRAWAL	UNUSED	33	0	30	2		TRUE				
452	EICHELBERGERS INC.	VERIZON- PHILA	WITHDRAWAL	UNUSED	33	0	30	2		TRUE				
453	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	35	0	0	0		FALSE				
454	ENVIRONMENTAL PROBING INVESTIGATIONS INC	hess	MONITORING	INDUSTRIAL	23	0	3	4		TRUE	1	6		30
455	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
456	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	25	0	0	0		FALSE				
457	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	25	0	0	0		FALSE				
458	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	22	0	0	0		FALSE				
459	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	25	0	0	0		FALSE				
460	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	25	0	0	0		FALSE				
461	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	30	0	0	0		FALSE				
462	ENVIRONMENTAL PROBING INVESTIGATIONS INC	SHERATON HOTEL	MONITORING	INDUSTRIAL	18	0	8	2		TRUE	1	8		30
463	ENVIRONMENTAL PROBING INVESTIGATIONS INC	SHERATON HOTEL	MONITORING	INDUSTRIAL	17	0	7	2		TRUE	1	8		30
464	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	28	0	0	0		FALSE				
465	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	30	0	0	0		FALSE				
466	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
467	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
468	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	30	0	0	0		FALSE				
469	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
470	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	34	0	0	0		FALSE				
471	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
472	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	14	0	0	0		FALSE				
473	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
474	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
475	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	26	0	0	0		FALSE				
476	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
477	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
478	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
479	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	30	0	0	0		FALSE				
480	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
481	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	20	0	0	0		FALSE				
482	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	26	0	0	0		FALSE				
483	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
484	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	26	0	0	0		FALSE				
485	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	14	0	0	0		FALSE				
486	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	32	0	0	0		FALSE				
487	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	14	0	0	0		FALSE				
488	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	14	0	0	0		FALSE				
489	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	14	0	0	0		FALSE				
490	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
491	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
492	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	18	0	0	0		FALSE				
493	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	25	0	0	0		FALSE				
494	PARRATT-WOLFF INC	SUNOCO	WITHDRAWAL	UNKNOWN	15	0	0	0		FALSE				
495	EICHELBERGERS INC.	ESSINGTON CORVEST PATRIOT L.P.		UNUSED	15	0	5	2		TRUE				
496	EICHELBERGERS INC.	ESSINGTON CORVEST PATRIOT L.P.		UNUSED	20	0	5	2		TRUE				
497	EICHELBERGERS INC.	ESSINGTON CORVEST PATRIOT L.P.		UNUSED	25	0	10	2		TRUE				
498	EICHELBERGERS INC.	ESSINGTON CORVEST PATRIOT L.P.		UNUSED	20	0	15	2		TRUE				
499	EICHELBERGERS INC.	ESSINGTON CORVEST PATRIOT L.P.		UNUSED	35	0	25	2		TRUE				
500	EICHELBERGERS INC.	ESSINGTON CORVEST PATRIOT L.P.		UNUSED	25	0	10	2		TRUE				
501	ARTESIAN WELL DRLG CO	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	100	0	0	12		FALSE	50	20		
502	ARTESIAN WELL DRLG CO	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	100	0	80	8		FALSE	50	20		
503	THOMAS G KEYES INC	SEABOARD SUPPLY CO	UNUSED	UNUSED	160	0	46	6		FALSE	50		159	1

Table M.1

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
504	THOMAS G KEYES INC	SEABOARD SUPPLY CO	UNUSED	UNUSED	160	0	46	6		FALSE	11.1		43	2
505	ARTESIAN WELL DRLG CO	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	80	0	80	12		FALSE	115	33		
506	RIDPATH AND POTTER COMPANY	ZUCKERMAN & HONICKMA	UNUSED	UNUSED	300	0	18	8		FALSE	78	9.89		
507	RIDPATH AND POTTER COMPANY	COCA-COLA BOTTLING C	DESTROYED	UNUSED	383	0	50	8		FALSE	120	25	85	
508	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	76	0	0	20		FALSE	201	20.98709	42.6	
509	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	76	0	0	16		FALSE	201	20.98709	42.6	
510	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	76	0	54	12		FALSE	201	20.98709	42.6	
511	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	DESTROYED	UNUSED	78	0	0	16		FALSE		23		
512	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	DESTROYED	UNUSED	78	0	58	12		FALSE		23		
513	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	DESTROYED	UNUSED	78	0	0	16		FALSE	300			
514	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	DESTROYED	UNUSED	78	0	58	12		FALSE	300			
515	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	95	0	0	6		FALSE	325			
516	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	95	0	0	120		FALSE	325			
517	RIDPATH AND POTTER COMPANY	PRESIDENT THEATER	UNUSED	UNUSED	86	0	65	8		FALSE	15	29.1	31.6	2
518	RIDPATH AND POTTER COMPANY	PRESIDENT THEATER	UNUSED	UNUSED	86	0	65	8		FALSE	90			
519	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	UNUSED	UNUSED	78	0	60	10		FALSE	614			
520	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	UNUSED	UNUSED	78	0	60	10		FALSE		10.6		
521	RIDPATH AND POTTER COMPANY	ATLANTIC REFINING CO	UNUSED	UNUSED	78	0	60	10		FALSE	64	11.23158	14.6	1
522	UNKNOWN	PHILA GAS WORKS	UNUSED	UNUSED	360	0	132	6		FALSE	19	31.7814	36.2	2
523	UNKNOWN	PHILA GAS WORKS	UNUSED	UNUSED	360	0	132	6		FALSE	120	29.4		
524	ARTESIAN WELL DRLG CO	MIRTO CULLET SUPPLY	DESTROYED	UNUSED	66	0	66	6		FALSE	45	32		
525	THOMAS B HARPER	GIRARD ESTATE	UNUSED	UNUSED	612	0	153	8		FALSE	120	22.3		
526	UNKNOWN	CITY OF PHILA	OBSERVATION	UNUSED	25	0	20	1.5		FALSE	0.08	15.5	23.5	2
527	THOMAS B HARPER	PRINTZ DEGREASING CO	DESTROYED	UNUSED	253	0	106	6		FALSE	60	14		
528	UNKNOWN	HOG ISLAND LUMBER CO	DESTROYED	UNUSED	97	0	0	6		FALSE	1.5	16	58.5	
529	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	142	0	0	24		FALSE		10.2		
530	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	142	0	117	10		FALSE		10.2		
531	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	142	0	0	24		FALSE	560	24	44	
532	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	142	0	0	16		FALSE		10.2		
533	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	142	0	0	16		FALSE	560	24	44	
534	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	142	0	117	10		FALSE	560	24	44	
535	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	132	0	0	24		FALSE	440	28.2		
536	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	132	0	107	10		FALSE	440	28.2		
537	LAYNE CHRISTENSEN COMPANY	U S NAVAL HOSPITAL	DESTROYED	UNUSED	132	0	0	16		FALSE	440	28.2		
538	JOHN RULON	GULF OIL CORP	WITHDRAWAL	INDUSTRIAL	82	0	0	12		FALSE	420	11.6		4
539	JOHN RULON	GULF OIL CORP	WITHDRAWAL	INDUSTRIAL	82	0	72	6		FALSE	420	11.6		4
540	JOHN RULON	GULF OIL CORP	WITHDRAWAL	INDUSTRIAL	82	0	72	6		FALSE	310		35	
541	JOHN RULON	GULF OIL CORP	WITHDRAWAL	INDUSTRIAL	82	0	72	6		FALSE		11.9		
542	ARTESIAN WELL DRLG CO	LEAGUE ISLAND PARK	DESTROYED	UNUSED	82	0	0	6		FALSE	100	9.4		
543	ARTESIAN WELL DRLG CO	LEAGUE ISLAND PARK	DESTROYED	UNUSED	0	0	0	6		FALSE	100			
544	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	0	30		FALSE		19.2		
545	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	0	18		FALSE	725		80	
546	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	0	18		FALSE		19.2		
547	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	138	12		FALSE		19.2		
548	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	0	18		FALSE	17.6		20.2	1
549	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	0	30		FALSE	17.6		20.2	1
550	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	138	12		FALSE	17.6		20.2	1
551	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	0	30		FALSE	725		80	
552	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	163	0	138	12		FALSE	725		80	
553	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	173	0	0	30		FALSE	735	28.4		
554	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	173	0	148	12		FALSE	735	28.4		
555	LAYNE CHRISTENSEN COMPANY	U S NAVY	UNUSED	UNUSED	173	0	0	18		FALSE	735	28.4		
556	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	40	0	10	12		FALSE				
557	THOMAS B HARPER	BREYER ICE CREAM CO	DESTROYED	UNUSED	393	0	56	8		FALSE	100	20		
558	JOHN RULON	BREYER ICE CREAM CO	DESTROYED	UNUSED	393	0	0	0		FALSE	100	20		
559	THOMAS B HARPER	F G VOGT & SONS	DESTROYED	UNUSED	47	0	11	6		FALSE	50	20		
560	THOMAS B HARPER	F G VOGT & SONS	DESTROYED	UNUSED	40	0	40	8		FALSE	37	18		
561	THOMAS B HARPER	F G VOGT & SONS	DESTROYED	UNUSED	102	0	38	8		FALSE		18		
562	JOHN RULON	PHILA ABATTOIR CO	UNUSED	UNUSED	31	0	0	16		FALSE	60	4.56		
563	ARTESIAN WELL DRLG CO	HYMAN BRODSKY & SON	DESTROYED	UNUSED	65	0	65	8		FALSE	300	11		
564	RIDPATH AND POTTER COMPANY	VICTOR DAIRIES INC	UNUSED	UNUSED	490	0	21	8		FALSE	10	19	124	7.5
565	JOHN RULON	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	130	0	0	16		FALSE		34		
566	JOHN RULON	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	130	0	79	10		FALSE		34		

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FID	Driller	OriginalOw	WellUse	WaterUse	WellDepth_	TopOfCasin	BottomOfCa	CasingDiam	DepthToBed	BedrockNot	WellYield_	StaticWate	WaterLevel	LengthOfTe
567	JOHN RULON	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	130	0	0	16		FALSE	185	34.18841	61	
568	JOHN RULON	HENRY BOWER CHEMICAL	DESTROYED	UNUSED	130	0	79	10		FALSE	185	34.18841	61	
569	JOHN RULON	PA RANGE & BOILER CO	DESTROYED	UNUSED	78	0	0	6		FALSE	12			
570	THOMAS B HARPER	AMERICAN ICE CO	DESTROYED	UNUSED	487	0	72	8		FALSE	75	40		
571	KOHL BROS. INC.	ANDERSON INC	DESTROYED	UNUSED	404	0	48	6		FALSE	50	40		
572	RIDPATH AND POTTER COMPANY	MILLAR BROS & CO	UNUSED	UNUSED	230	0	54	8		FALSE	80	20.7		
573	ARTESIAN WELL DRLG CO	PURITAN LOOMS	DESTROYED	UNUSED	58	0	58	12		FALSE	180	19		
574	QUINN & HERRON	CITY OF PHILA	DESTROYED	UNUSED	442	0	28	8		FALSE	100	5		
575	LAYNE CHRISTENSEN COMPANY	EARL THEATER	DESTROYED	UNUSED	51	0	0	12		FALSE	114	33.875	41	
576	LAYNE CHRISTENSEN COMPANY	EARL THEATER	DESTROYED	UNUSED	51	0	41	8		FALSE	114	33.875	41	
577	THOMAS B HARPER	JOS RYERSON & SON IN	DESTROYED	UNUSED	200	0	9	8		FALSE	40	25		
578	THOMAS B HARPER	JOS RYERSON & SON IN	DESTROYED	UNUSED	528	0	0	8		FALSE	50			
579	THOMAS B HARPER	EDMUND WEBSTERS BRIC	DESTROYED	UNUSED	68	0	0	8		FALSE				
580	THOMAS B HARPER	FLEISHER IND CENTER	DESTROYED	UNUSED	1400	0	85	10		FALSE	15	27		
581	THOMAS B HARPER	FLEISHER IND CENTER	DESTROYED	UNUSED	490	0	80	8		FALSE	18	22		
582	THOMAS B HARPER	FLEISHER IND CENTER	DESTROYED	UNUSED	580	0	83	8		FALSE	60	20		
583	ARTESIAN WELL DRLG CO	AMERICAN ICE CO	DESTROYED	UNUSED	90	0	70	6		FALSE	50			
584	UNKNOWN	BREEZE THEATER	DESTROYED	UNUSED	70	0	60	8		FALSE	47	41.2		
585	UNKNOWN	ATLANTIC RICHFIELD C	OBSERVATION	UNUSED	18	0	9	12		FALSE		12		
586	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	101	0	0	0		FALSE				
587	UNKNOWN	ATLANTIC RICHFIELD C	OBSERVATION	UNUSED	25.4	0	16.4	16		FALSE		1.39		
588	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	76	0	66	16		FALSE				
589	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	76	0	0	20		FALSE				
590	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	104	0	0	18		FALSE		18.7		
591	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	104	0	0	24		FALSE		18.7		
592	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	94	0	0	0		FALSE				
593	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	68	0	62	60		FALSE	200	6.5		
594	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	95	0	0	0		FALSE				
595	RIDPATH AND POTTER COMPANY	REGAL PETROLEUM PROD	DESTROYED	UNUSED	351	0	22	8		FALSE	153	4	78.7	7.5
596	QUINN & HERRON	JARDIN BRICK CO	DESTROYED	UNUSED	215	0	96	6		FALSE	70			
597	QUINN & HERRON	JARDIN BRICK CO	DESTROYED	UNUSED	240	0	90	6		FALSE	60			
598	QUINN & HERRON	JARDIN BRICK CO	DESTROYED	UNUSED	250	0	96	6		FALSE	50			
599	ARTESIAN WELL DRLG CO	ATLANTIC REFINING CO	DESTROYED	UNUSED	150	0	95	16		FALSE		34		
600	ARTESIAN WELL DRLG CO	ATLANTIC REFINING CO	DESTROYED	UNUSED	150	0	95	16		FALSE	30			
601	LAYNE CHRISTENSEN COMPANY	ATLANTIC REFINING CO	DESTROYED	UNUSED	90	0	0	38		FALSE	300	20	35	
602	LAYNE CHRISTENSEN COMPANY	ATLANTIC REFINING CO	DESTROYED	UNUSED	90	0	56	26		FALSE	300	20	35	
603	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	85	0	0	40		FALSE				
604	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	85	0	62	24		FALSE				
605	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	97	0	75	20		FALSE				
606	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	97	0	77	16		FALSE				
607	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	101	0	0	20		FALSE	300	20		
608	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	101	0	81	16		FALSE	300	20		
609	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	0	0	0	0		FALSE				
610	RIDPATH AND POTTER COMPANY	WFIL TRANSMISSION ST	DESTROYED	UNUSED	71	0	62	6		FALSE	50	9	10	
611	UNKNOWN	ATLANTIC REFINING CO	DESTROYED	UNUSED	0	0	0	0		FALSE				
612	AC SCHULTES INC	ARCO PETROLEUM PROD CO	WITHDRAWAL	OTHER	30	0	10	14		FALSE	225	12.5	20.2	337
613	THOMAS B HARPER	BROOKE H	DESTROYED	UNUSED	0	0	72	8		FALSE	75	25		
614	THOMAS B HARPER	PA FLEX MET TUBING C	DESTROYED	UNUSED	620	0	42	8		FALSE	60			
615	AC SCHULTES INC	ARCO PETROLEUM PROD CO	WITHDRAWAL	OTHER	27	0	17	6		FALSE	5.45	23.9	27	22
616	AC SCHULTES INC	ARCO PETROLEUM PROD CO	WITHDRAWAL	OTHER	27	0	17	6		FALSE	3.5	24.2	27	30.5
617	SPRAGUE & HENWOOD INC	GULF OIL CORP	DESTROYED	UNUSED	106	0	0	2		FALSE				
618	JOHN RULON	GULF OIL CORP	DESTROYED	UNUSED	79	0	0	6		FALSE				
619	ARTESIAN WELL DRLG CO	ATLANTIC REFINING CO	DESTROYED	UNUSED	74	0	0	6		FALSE	100	35.3		
620	SPRAGUE & HENWOOD INC	GULF OIL CORP	DESTROYED	UNUSED	90	0	0	2		FALSE				
621	SPRAGUE & HENWOOD INC	GULF OIL CORP	DESTROYED	UNUSED	70	0	0	2		FALSE				
622	SPRAGUE & HENWOOD INC	GULF OIL CORP	DESTROYED	UNUSED	73	0	0	2		FALSE				
623	SPRAGUE & HENWOOD INC	GULF OIL CORP	DESTROYED	UNUSED	81	0	0	2		FALSE				
624	JOHN RULON	GULF OIL CORP	DESTROYED	UNUSED	98	0	0	12		FALSE	100			
625	JOHN RULON	GULF OIL CORP	DESTROYED	UNUSED	98	0	88	6		FALSE	100			
626	JOHN RULON	GULF OIL CORP	DESTROYED	UNUSED	90	0	0	6		FALSE				
627	RIDPATH AND POTTER COMPANY	PA RAILROAD	DESTROYED	UNUSED	90.5	0	74	6		FALSE	170	6.33	36.8	
628	RIDPATH AND POTTER COMPANY	PA RAILROAD	DESTROYED	UNUSED	90.5	0	0	8		FALSE	170	6.33	36.8	
629	ARTESIAN WELL DRLG CO	LEAGUE ISLAND PARK	UNUSED	UNUSED	0	0	0	6		FALSE	100	12.7		

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630	ARTESIAN WELL DRLG CO	LEAGUE ISLAND PARK	DESTROYED	UNUSED	176	0	0	6		FALSE		31.4		
631	RIDPATH AND POTTER COMPANY	LEAGUE ISLAND PARK	DESTROYED	UNUSED	71	0	71	6		FALSE	50	18.84211	32	
632	THOMAS B HARPER	PA RAILROAD	DESTROYED	UNUSED	154	0	100	6		FALSE	6	20.3		
633	UNKNOWN	PENN DOT	OBSERVATION	OTHER	45	0	40	4		FALSE				
634	LAYNE CHRISTENSEN COMPANY	U S NAVY	DESTROYED	UNUSED	0	0	0	0		FALSE				
635	UNKNOWN	PENN DOT	OBSERVATION	OTHER	88	0	82	4		FALSE				
636	UNKNOWN	PENN DOT	OBSERVATION	OTHER	34	0	29	4		FALSE				
637	GRIFFIN WELL POINT	CITY OF PHILA	DESTROYED	UNUSED	40	0	20	12		FALSE	250			
638	GRIFFIN WELL POINT	CITY OF PHILA	DESTROYED	UNUSED	40	0	20	12		FALSE	250			
639	GRIFFIN WELL POINT	CITY OF PHILA	DESTROYED	UNUSED	40	0	20	12		FALSE	250			
640	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	80	0	0	6		FALSE		14		
641	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	80	0	75	4		FALSE		14		
642	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	80	0	0	6		FALSE	30			2
643	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	80	0	75	4		FALSE	30			2
644	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	23	0	18	4		FALSE	15			2
645	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	23	0	0	6		FALSE		14.1		
646	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	23	0	18	4		FALSE		14.1		
647	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	23	0	0	6		FALSE	15			2
648	GRIFFIN WELL POINT	CITY OF PHILA	DESTROYED	UNUSED	40	0	20	12		FALSE	250			
649	THOMAS B HARPER	PA RAILROAD	DESTROYED	UNUSED	49	0	41	8		FALSE	50	8		
650	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	27	0	10	12		FALSE				
651	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	32	0	10	12		FALSE				
652	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	29	0	10	12		FALSE				
653	GRIFFIN WELL POINT	CITY OF PHILA	UNUSED	UNUSED	25	0	19	12		FALSE				
654	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	0	6		FALSE		18.4		
655	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	25	4		FALSE		18.4		
656	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	0	6		FALSE	10			2
657	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	25	4		FALSE	10			2
658	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	100	0	95	4		FALSE		19.5		
659	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	100	0	0	6		FALSE		19.5		
660	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	100	0	0	6		FALSE	50			2
661	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	100	0	95	4		FALSE	50			2
662	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	0	0	0	12		FALSE				
663	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	40	0	10	12		FALSE				
664	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	0	6		FALSE		19.4		
665	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	25	4		FALSE		19.4		
666	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	0	6		FALSE	7			2
667	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	30	0	25	4		FALSE	7			2
668	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	110	0	0	6		FALSE		20.6		
669	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	110	0	105	4		FALSE		20.6		
670	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	110	0	105	4		FALSE	30			2
671	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	110	0	0	6		FALSE	30			2
672	GRIFFIN WELL POINT	CITY OF PHILA	WITHDRAWAL	DEWATER	40	0	14	12		FALSE				
673	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	40	0	0	6		FALSE		14.3		
674	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	40	0	35	4		FALSE		14.3		
675	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	40	0	0	6		FALSE	15			2
676	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	40	0	35	4		FALSE	15			2
677	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	130	0	125	4		FALSE		15.7		
678	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	130	0	0	6		FALSE		15.7		
679	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	130	0	0	6		FALSE	50			2
680	A C SCHULTES & SONS	CITY OF PHILA	OBSERVATION	UNUSED	130	0	125	4		FALSE	50			2
681	ARTESIAN WELL DRLG CO	U S NAVY	DESTROYED	UNUSED	0	0	66	10		FALSE		19.1		
682	A C SCHULTES & SONS	CITY OF PHILA	TEST	UNKNOWN	0	0	0	0		FALSE				
683	UNKNOWN	PENN DOT	OBSERVATION	OTHER	116	0	110	4		FALSE				
684	UNKNOWN	PENN DOT	OBSERVATION	OTHER	36	0	31	4		FALSE				
685	THOMAS G KEYES INC	SEABOARD SUPPLY CO	WITHDRAWAL	DOMESTIC	160	0	46	6	40	FALSE	50	29	159	1

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