EXECUTIVE SUMMARY

This Remedial Investigation Report (RI Report) satisfies reporting requirements under Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2) statewide health standard and documents environmental conditions at the Jefferson Plant located in West Elizabeth, Pennsylvania. In accordance with the Notice of Intent to Remediate (NIR) submitted to the Pennsylvania Department of Environmental Protection (PADEP) on February 25, 2003, Hercules Incorporated is seeking liability release under applicable Act 2 standards for site media (soil, groundwater, surface water, sediment, and indoor air).

This RI Report has been prepared in accordance with Title 25, PA Code, Chapter 250 regulations, and the *Act 2 Technical Guidance Manual* (PADEP, 2002). This report presents historical characterization data and evaluates potential exposure pathways identified in the site conceptual model. The RI Report findings are as follows:

- There are no surface or subsurface soil exceedances of applicable direct-contact Medium-Specific Concentrations (MSCs) for constituents of concern (COC) listed on the NIR. Therefore, the direct-contact exposure pathway with respect to soils is insignificant and does not require further evaluation.

- The soil-to-groundwater pathway for surface soils requires further evaluation for 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, ethylbenzene, and toluene. The soil-to-groundwater pathway for subsurface soils requires further evaluation for 1,2,4-TMB, 1,3,5-TMB, benzene, and naphthalene.

- Based on a comprehensive evaluation of site groundwater relative to Act 2 non-residential, used aquifer (total dissolved solids $\leq$ 2,500 milligrams per liter [mg/l]) MSCs, the following parameters are considered to be COC for groundwater:
  - Volatile organic compounds: 1,2,4-TMB, 1,3,5-TMB, 1,1-dichloroethene, 1,1-dichloroethane, *cis*-1,2-dichloroethene, acrolein, benzene, ethylbenzene, styrene, tetrachloroethene, trichloroethene, vinyl chloride, and o-xylene.
  - Semivolatile organic compounds: 1,4-dioxane, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, naphthalene, and pentachlorophenol.

- Inorganics: antimony, arsenic, barium, beryllium, cadmium, chromium, lead, nickel, thallium, and zinc.

- The direct-contact exposure pathway related to potable on-site groundwater is incomplete. Currently, there is no known on-site use of groundwater, and site groundwater discharges to the unnamed tributary which transects the site and the Monongahela River. Restrictive covenants at the Jefferson Plant will limit on-site groundwater usage within the groundwater release of liability area to monitoring and remediation purposes only.

- Based on surface water samples collected from the unnamed tributary to the Monongahela River, benzene and toluene exceeded Chapter 16 criteria. The direct-contact exposure pathway for surface water is complete.

- Based on sediment samples collected from the unnamed tributary to the Monongahela River, toluene, xylenes, benzo(a)pyrene, fluoranthene, naphthalene, phenanthrene, pyrene, arsenic, copper, nickel, and zinc exceeded U.S. Environmental Protection Agency (USEPA) ecological toxicity (Ecotox) criteria. The direct-contact exposure pathway for sediment is complete.

- Analytical results for indoor air sampling did not exceed Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs), therefore, no further evaluation is needed.

- Groundwater flow assessments conducted at the Under Creek Interceptor Trench (UCIT) and Lower Plant Interceptor Trench (LPIT) demonstrated that the trenches capture impacted groundwater and light non-aqueous phase liquids (LNAPL).

- An investigation of the storm sewer system between the 837 Tank Farm and Upper Plant Areas indicates that impacted groundwater and LNAPL are infiltrating into the storm sewer and are discharging to Jorgy's Pond.

- A fate and transport analysis completed for the RI indicates that the surface water concentration of COC will not theoretically exceed any of the four water quality-based criteria used by PENTOXSD in the Finished Products Warehouse Area (southeastern portion of the site). Additionally, model simulations indicate that the surface water concentrations of COC in the Lower Plant Area (eastern portion of the site) will not theoretically exceed any of the four water quality-based criteria used by PENTOXSD.

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REPORT
REMEDIAL INVESTIGATION
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

1.0 INTRODUCTION

Cummings/Riter Consultants, Inc. (Cummings/Riter) was retained by Hercules Incorporated to prepare this Remedial Investigation Report (RI Report) for the Jefferson Plant located in West Elizabeth, Pennsylvania (Figure 1). This report was prepared based upon the provisions of Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2) and the *Final Draft of the Act 2 Technical Guidance Manual* (TGM, Pennsylvania Department of Environmental Protection [PADEP], 2002) administered by the PADEP. The scope of information contained in this RI Report is based on the findings of historical investigations conducted at the facility.

This RI Report is structured as follows: Section 2.0 provides a site description, discusses the operational history of the Jefferson Plant, summarizes the geologic and hydrogeologic setting information, and provides a description of the site conceptual model. Section 3.0 summarizes previous investigations and remedial activities which describe the nature and extent of contamination. Section 4.0 evaluates environmental conditions with respect to soils, groundwater, surface water, sediment, and indoor air using applicable Act 2 statewide health standards and other appropriate standards. Groundwater flow assessments related to on-site groundwater interceptor trenches are also discussed in Section 4.0. Section 5.0 identifies potential sources of constituents of concern (COC) in soils, groundwater, surface water, sediment, and indoor air. Section 6.0 identifies and evaluates migration pathways, and includes a fate and transport analysis of COC in groundwater. Section 7.0 summarizes the RI Report findings.

2.0 SITE DESCRIPTION AND HISTORY

The following discussion of the site description and history has been modified from the description presented in the Description of Current Conditions (DOCC) and Work Plan (Management and Technical Resources, Inc. [MTR], 2003).

2.1 PROPERTY DESCRIPTION

The Jefferson Plant is located in the Borough of Jefferson, Pennsylvania, Allegheny County (Figure 1). The site is comprised of approximately 56 acres and is situated along the western bank of the Monongahela River directly adjacent to Lock and Dam No. 3. State Route 837 and the Norfolk Southern rail line bisect the Jefferson Plant. The majority of the site is developed with paved roadways, buildings, process equipment, and aboveground storage tanks (ASTs). Several businesses and residences lie to the north and northeast of the property. The plant has seven major production areas which include: Upper Plant, V-8 Area, Office, Finished Products Warehouse, C5 Plant, Lower Plant, and 837 Tank Farm (Figure 2).

2.2 SITE OWNERSHIP/OPERATIONAL HISTORY

Operations at the former Hercules Incorporated site began in 1954 when the Pennsylvania Industrial Chemical Company (PICCO) began production of hydrocarbon resin. PICCO's operations were situated in the northeastern area of the Lower Plant. In 1973, Hercules Incorporated purchased PICCO's facilities, assets, and liabilities. In 1993, Hercules Incorporated formed a joint venture with Sanyo Chemical Company, Ltd. (Sanyo Chemical) located in Japan, which became Hercules Sanyo, Inc. (HSI). The HSI joint venture focused on specific manufacturing processes at the northeast end of the Lower Plant Area. Fourteen acres of industrial property, located to the south of the Lower Plant, were acquired by Hercules Incorporated in the early 1980s and subsequently developed into the C5 Plant. In 1981, Hercules Incorporated purchased property from the McKeesport Industrial Development Authority that ultimately became the Finished Products Warehouse. In 2001, Eastman Chemical Resins, Inc. (Eastman) purchased the site from Hercules Incorporated. Also, in 2001, the joint venture between

Hercules Incorporated and Sanyo Chemical (Japan) ended, and Sanyo Chemical and Eastman became the sole owners of the former PICCO operations located in the Lower Plant Area (Figure 2).

Eastman currently manufactures hydrocarbon resins, intermediates, and co-products that are used in a variety of industries. Raw products consist primarily of petroleum-based hydrocarbon liquids. The raw products are polymerized into an intermediate product or resin solution that is ultimately used by industrial customers. The intermediates are shipped in bulk solid or liquid form via drums, tank car, and bags.

2.3 GEOLOGIC SETTING

2.3.1 Physiography and Topography

The Jefferson Plant is situated within the Pittsburgh Low Plateau Section of the Appalachian Plateaus Physiographic Province. The current land surface within the Pittsburgh Low Plateau Section resulted from the stream erosion of a prehistoric plain and is characterized by narrow, relatively shallow, incised valleys (Sevon, 2000). The Jefferson Plant is bordered by the Monongahela River to the southeast. The topography of the facility is sloping, with a change in elevation of approximately 30 feet from the northwest property boundary to the southeast property boundary. The ground surface slopes to the southeast toward the Monongahela River. Surface water features are present at the Jefferson Plant including Jorgy's Pond and an unnamed tributary to the Monongahela River (Figure 3).

2.3.2 Unconsolidated Deposits

The unconsolidated deposits at the site consist of fill material and Quaternary-age alluvial deposits. Fill material exists in some portions of the plant and is most prevalent in the western plant area (MTR, 2003). The fill material consists of varying amounts of sand, slag, brick fragments, and concrete. Based on review of historic topographic maps, it appears that up to 12 feet of fill has been placed in the western plant site areas (MTR, 2003). Fill material is also used for the non-paved roadways at the site.

Unconsolidated alluvial deposits exist beneath the plant area and generally display a fining upward sequence, attaining a maximum thickness of approximately 70 feet near the Monongahela River. The thickness of the alluvial deposits decreases to the west (837 Tank Farm Area) as the topographic relief increases. The basal portion of the alluvium is comprised of sand and trace gravels with lenticular deposits of clay and silt. The basal portion ranges in thickness from 15 feet to 25 feet. Immediately above the basal portion layer, a silty sand/sandy silt is encountered over the majority of the site area. At some site locations (e.g., Lower Plant), the silty sand/sandy silt appears to be absent and is likely replaced by a clayey silt/silty clay. The clayey silt/silty clay appears to be limited to the site boundary along the Monongahela River and extends to the west to the approximate mid-Lower Plant, C5 Plant, and Finished Products Warehouse Areas. West of the mid Lower Plant, C5 Plant, and Finished Products Warehouse Areas, the clayey silt/silty clay is absent and a silty sand/sandy silt unit exists. The clayey silt/silty clay ranges in thickness from approximately 8 feet to 40 feet with the maximum thickness observed in the northeastern Lower Plant Area. The silty sand/sandy silt can range in thickness from approximately 20 feet to 40 feet. Figure 3 shows the locations of two cross-sections constructed for the site. The cross-sections (Figures 4 and 5) show the general stratigraphy of the unconsolidated and bedrock units encountered at the site.

2.3.3 Bedrock

Bedrock at the site includes the Casselman Formation of Pennsylvanian Age. The Casselman Formation is not exposed at the site, but underlies the alluvial deposits within the site area. The Casselman Formation is characterized primarily as interbedded sandstone and claystone. The Casselman Formation was encountered during drilling at depths ranging from approximately 58 feet to 77 feet below ground surface (bgs) during the 2003 to 2004 Cummings/Riter investigation at the site. The depth to the bedrock is the shallowest at the northwest portion of the site, and deepest to the southeast toward the Monongahela River.

2.4 Hydrogeologic Setting

Groundwater is characterized by three distinct hydrogeologic zones at the site which are defined as the perched, unconsolidated shallow, and unconsolidated deep groundwater zones. These three zones are associated with either the fill or the unconsolidated Quaternary alluvium deposits that underlie the site. Each of these hydrogeologic zones is discussed separately in the following subsections.

2.4.1 Perched Groundwater Zone

Perched groundwater exists at some site areas and is dependent on the location and thickness of the fill. Perched groundwater likely exists as a result of the development of localized lower hydraulic conductivity (K) layers found above the shallow water table surface (MTR, 2003). The lower (K) layers have the ability to impede the downward vertical migration of infiltrating groundwater resulting in a perched groundwater zone.

Perched groundwater has been extensively investigated in the Lower Plant due to the presence of light non-aqueous phase liquids (LNAPL) in that area. The perched groundwater zone can be attributed to the presence of a clayey silt/silty clay layer and/or the presence of fill material placed in this area. Perched groundwater also exists in the Upper Plant Area and has been observed as seepage along the northern banks of Jorgy's Pond. The perched groundwater zone in the Upper Plant Area has formed from the placement of fill material over the existing ground surface. The fill in the Upper Plant Area consists primarily of gravel, slag, and sand, which creates a layer of relative high K value. The former ground surface (which now underlies the fill) in the Upper Plant Area is characterized by a silty clay layer, which is less conducive to groundwater infiltration.

The depth to perched groundwater can be relatively shallow, particularly in the western portion of the Upper Plant Area. Water was observed as shallow as two feet in some of the borings in this area during the site characterization in November and December 2003. Groundwater flow is toward the Monongahela River and generally follows topography in the perched groundwater zone. Perched groundwater (where present) is also believed to discharge to Jorgy's Pond and the unnamed tributary to the Monongahela River.

2.4.2 Shallow Unconsolidated Groundwater Zone

Groundwater is present in the unconsolidated silty sand/sandy silt or clayey silt/silty sand associated with the deposition of the Quaternary alluvium. The depth to these deposits varies throughout the site depending on the thickness of the overlying fill material. The shallow groundwater is laterally consistent over the site area and forms the water table surface. Groundwater flow in the shallow zone is toward the Monongahela River. The unnamed tributary to the Monongahela River also acts as a localized discharge point for shallow groundwater. Several wells monitoring the shallow unconsolidated groundwater zone located in the Upper Plant and Lower Plant Areas also contain LNAPL. Potentiometric surface maps depicting groundwater flow in the shallow unconsolidated groundwater zone during two monitoring events are included as Figures 6 and 7.

The average horizontal hydraulic gradient in the shallow unconsolidated groundwater zone was 0.017 foot per foot (ft/ft) (southwestern portion of the site) and 0.018 ft/ft (eastern portion of the site) using water level data measured on February 26, 2004. Monitoring Wells E-1 and E-14 were used to calculate the average horizontal hydraulic gradient for the southwestern portion of the site and Monitoring Wells E-51 and W-7 were used for the eastern portion of the site. Based on an average K value of 0.56 foot/day and an assumed porosity of 0.25, the average linear groundwater velocity in the shallow unconsolidated groundwater zone is estimated to be approximately 0.04 feet/day (MTR, 2003).

2.4.3 Deep Unconsolidated Groundwater Zone

The deep unconsolidated groundwater zone is characterized by sand with trace gravels, which are encountered at a depth of approximately 50 feet bgs. These basal sand and trace gravels occur just above the unconsolidated deposits/bedrock interface. The shallow and deep unconsolidated groundwater zones are hydraulically connected. The deep unconsolidated groundwater zone has an overall average K value of 8.56 feet/day (or 3.02×10^{-3} centimeters per second [cm/sec]) based on slug testing (rising head and falling head) performed in the five new deep groundwater monitoring wells (E-59, E-60, E-61, E-62, and E-63) installed by Cummings/Riter in February 2004. Table 1 provides a summary of the K values for the deep unconsolidated groundwater zone wells tested during this investigation.

The new deep groundwater monitoring wells are spatially distributed across the site; therefore, the average K value is believed to be representative of deep groundwater zone conditions at the site. Potentiometric surface maps depicting groundwater flow in the deep unconsolidated groundwater zone during two monitoring events are included as Figures 8 and 9. Lithologic boring logs and well installation details of the newly installed deep unconsolidated groundwater zone wells have been provided in Appendix A.

The deep unconsolidated groundwater zone has a horizontal hydraulic gradient of 0.018 ft/ft using water level data from February 26, 2004 at Monitoring Wells E-3AD and E-17D. The average K value of 8.56 feet/day for the deep unconsolidated groundwater zone was determined by the slug tests (both falling head and rising head) conducted at the five new deep groundwater monitoring wells (E-59, E-60, E-61, E-62, and E-63) installed by Cummings/Riter. The assumed porosity of the deep groundwater zone deposits is estimated to be 0.25, which is similar to the porosity of that of the shallow unconsolidated deposits. The average linear groundwater velocity in the deep unconsolidated zone is estimated to be approximately 0.62 feet/day.

Vertical hydraulic gradients were assessed between the shallow and deeper intervals of the alluvial aquifer at five well pairs (E-8/E-9, E-13/E-14, E-17/E-18, E-24/E-46, and E-40/E-47) using the February 26, 2004 data. The comparison of the water levels in the well pairs indicates that a downward vertical hydraulic gradient exists between the shallow and deep unconsolidated groundwater zones on the dates that the levels were recorded. Table 2 presents a summary of the water level elevations measured during this investigation.

2.4.4 Surface Water/Groundwater Relationship

The Monongahela River, and to a lesser extent, the unnamed tributary to the Monongahela River, influence groundwater flow patterns by providing a discharge point for site groundwater. Shallow groundwater flow is generally from northeast to southwest toward the Monongahela River.

The unnamed tributary flows through the 837 Tank Farm Area and into a 36-inch culvert at its intersection with State Route 837. The culvert diverts surface water beneath the Upper Plant Area until it discharges into Jorgy's Pond (Figure 2). A second culvert also runs from the 837 Tank Farm Area to Jorgy's Pond. The second culvert is 24-inches in diameter and is located northwest of the unnamed tributary culvert. The second culvert diverts surface runoff water from two catch basins located on either side of State Route 837 to Jorgy's Pond. The location of these storm water culverts are provided on Figure 3. Both of the culverts are believed to act as a localized discharge point for perched groundwater.

A videotape inspection of the two culverts conducted by Cummings/Riter in November 2003 found several locations where groundwater was observed to be seeping into each culvert. A letter report (Cummings/Riter, 2004) was prepared containing a detailed description of the inspection findings. A copy of the letter report is included as Appendix B. Water samples were collected from the 36-inch culvert at various points along its length. The analytical results from these samples indicate that impacted groundwater may infiltrate into the storm sewer system. Findings of the culvert water sampling are further discussed in Section 4.6.

From Jorgy's Pond to the C5 Plant and Lower Plant Areas, the unnamed tributary flows southeast through a culvert beneath the railroad to a discharge point located in the northern portion of the C5 Plant Area (Figure 2). The unnamed tributary then flows to its discharge point at the Monongahela River. An impermeable synthetic liner was installed beneath the exposed portion of the unnamed tributary in the C5 Plant and Lower Plant Areas as part of the Under Creek Interceptor Trench (UCIT) installation. The liner is designed to minimize hydraulic communication between groundwater and surface water in the C5 Plant and Lower Plant Areas by directing groundwater that typically discharges to the unnamed tributary into a collection system for treatment. During non-pumping conditions, groundwater flow in the area of the UCIT is directed from west to east toward the Monongahela River. Under pumping conditions, groundwater in the vicinity of the UCIT is captured and transferred to the on-site treatment system.

In the Lower Plant Area (Figure 2), groundwater discharge from the perched groundwater zone to the Monongahela River is influenced by the Lower Plant Interceptor Trench (LPIT). The LPIT was constructed to prevent the discharge of perched groundwater and LNAPL to the Monongahela River. Perched groundwater and LNAPL that collects in the LPIT is removed for treatment at the on-site treatment plant.

2.5 CONCEPTUAL SITE MODEL

This section, along with the information provided in Section 2.4 constitutes the conceptual site model which provides the information necessary to conduct the fate and transport analysis (Section 6.3). The following discussion updates the conceptual site model presented in the DOCC and Work Plan (MTR, 2003).

The conceptual site model was developed to describe mechanisms influencing the migration and fate of constituents released to soil and ultimately groundwater. The following sections describe the conceptual site model.

2.5.1 Physical Conceptual Site Model

Impacts noted in site groundwater emanated from a series of undefined and unrelated releases over the life of the plant. It is believed that the number, magnitude, and frequency of releases at the plant have decreased over time due to efforts to continually upgrade operational areas and the focus placed on materials management. Therefore, the following description is more applicable to the early operational period of the plant than the current day plant.

The source of constituents of interest (primarily aromatic VOCs) potentially occurred from past material handling practices, accidental releases, leaks, etc. During initial operations at the plant, there were fewer paved roadways, concrete floors, and secondary containment structures than are now present at the site. In the absence of containment structures, a release likely migrated onto the ground surface. Once released to the ground surface, the mass (i.e., either product or dissolved aqueous phase constituents in water) entered the unsaturated zone and migrated vertically under the influence of gravity and/or driven by infiltrating precipitation. As the constituents migrated through the unsaturated zone, a percentage of the mass was adsorbed onto the sediments or held by capillary forces. The resultant effect is the presence of constituents in unsaturated soils.

The dissolved aqueous phase likely reached groundwater before the product, since vertical migration of the dissolved aqueous phase was less impeded than the product. Once the dissolved aqueous phase encountered groundwater (perched or shallow), mixing occurred. Once entrained in groundwater, dissolved aqueous phase migration was controlled by the advective flow of groundwater. Though flow direction was influenced by the advective flow of groundwater, the constituent velocity was less than that of groundwater due to contaminant retardation (primarily, adsorption). Horizontally, the groundwater and the dissolved aqueous phase would migrate until intercepted at a hydraulic boundary (i.e., surface water bodies) where groundwater discharges.

Detected concentrations of dissolved phase constituents in groundwater samples collected from monitoring wells represent groundwater quality at that specific location in the aquifer or perched groundwater. Vertically, a downward hydraulic gradient has been observed and would promote the vertical migration of dissolved phase constituents to the deeper aquifer. However, the absence of constituents in the deep groundwater zone suggests that the vertical hydraulic conductivity of the unconsolidated deposits and natural attenuation factors have been effective in minimizing the vertical migration of dissolved phase constituents from the perched and/or shallow unconsolidated groundwater zones to the deep unconsolidated groundwater zone.

Vertical migration of product through the unsaturated zone is believed to be slower than the dissolved aqueous phase and can be attributed to the product viscosity and overcoming physical dynamics such as interstitial tensions and capillary forces. Product will migrate to groundwater when a sufficient mass exists to overcome forces impeding the vertical movement. Since the product has a specific gravity less than water, the product will form a layer on top of the water table when contacted. Since the product is immiscible, a separate phase distinct from groundwater forms and is referred to in this report as LNAPL. LNAPL, when encountered in monitoring wells, is usually detected as a measurable layer. Vertical migration of LNAPL through the saturated zone is not possible since the specific gravity of LNAPL is less than that of water and (under the forces of buoyancy) will float. Horizontal LNAPL migration is influenced by the groundwater flow direction, and the ability to spread is a function of a continual input from a source. Similar to groundwater, LNAPL will migrate with groundwater until encountering a discharge boundary. LNAPL seeps formerly noted along the surface water bodies can be attributed to migrating LNAPL. However, operation of the LPIT and UCIT is effective in intercepting and containing LNAPL, thereby preventing LNAPL from migrating to surface water.

LNAPL entrained within the unsaturated soils and groundwater can act as a continuing source of dissolved phase constituents to groundwater since complete LNAPL drainage is not possible due to it being entrained within porous media. When contacted by water, the resultant residual LNAPL promotes dissolution near the constituent solubility level.

LNAPL has been observed in perched and shallow unconsolidated zone monitoring wells in the 837 Tank Farm (one well), Upper Plant (three wells), C5 Plant (one well), and Lower Plant (three wells) Areas (Figures 6 and 7).

With regard to the dissolved phase chlorinated volatile organic compounds (VOCs) observed near the Finished Products Warehouse (Figure 2), it is postulated that former tenants of the warehouse may have improperly disposed of or accidentally released chlorinated VOC-impacted liquids on the ground within and near the warehouse. This theory is based on the groundwater analytical results in wells in the vicinity of the Finished Products Warehouse. The same physical forces responsible for the vertical migration of the dissolved aqueous phase aromatic VOCs described above are responsible for transporting the dissolved aqueous phase chlorinated VOCs to groundwater, where the constituents are introduced, mixed, and subsequently transported via advective groundwater flow to groundwater discharge boundaries.

As discussed above, the surface water bodies act as discharge boundaries for groundwater. The installation of the UCIT and LPIT has effectively intercepted groundwater (and associated LNAPL) flow prior to reaching the surface water bodies. In particular, the impermeable synthetic liner placed within the unnamed tributary stream channel acts as a physical barrier for the discharge of groundwater to surface water. Since groundwater is pumped from the trenches, a gradient is induced in the area that directs groundwater and LNAPL toward a hydraulic low (cone of depression). The collected water is then treated on site and discharged to the local publicly owned treatment works (POTW). The presence of the UCIT and LPIT has significantly reduced LNAPL discharges observed in the surface water bodies.

3.0 PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIVITIES

The following discussion of the previous investigation and remedial activities has been modified from the description presented in the DOCC and Work Plan (MTR, 2003).

3.1 PREVIOUS INVESTIGATIONS

The following subsections present investigations conducted prior to and after Hercules Incorporated entered into the Consent Order Agreement (COA) at the Jefferson Plant with the PADEP in November 1989. The pre-COA investigations were performed by Roy F. Weston, Inc. (Weston). Post-1989 COA investigations were performed by several consulting firms including GAI Consultants, Inc. (GAI), ARCADIS Geraghty/Miller, Inc. (ARCADIS), and KU Resources, Inc. (KU).

3.1.1 Pre-Consent Order Investigations

Weston initiated the first subsurface investigations at the site in 1982. The 1982 investigation was performed to define the groundwater table surface, determine direction of groundwater flow, define the thickness and areal extent of LNAPL, and recommend strategies for eliminating seeps to the Monongahela River and removal of LNAPL. A total of 20 wells were installed with 17 wells located in the Lower Plant Area and 3 wells located in the V-8 Area.

In 1983 and 1984, Weston expanded the 1982 investigation and installed four large diameter (three, 12-inch and one, 6-inch) recovery wells and excavated five test pits. Three of the recovery wells were located in the Lower Plant Area and one well was located in the V-8 Area. The test pits were excavated to determine soil conditions in an area of the plant inaccessible to drilling. The wells were installed and pumped to evaluate alternate technologies for the interception and recovery of LNAPL.

Weston also provided construction design for the LPIT to collect LNAPL and mitigate seepage to the Monongahela River. The LPIT was initiated in 1988 and was completed 1989. The LPIT is discussed in later paragraphs.

3.1.2 Post-Consent Order and Agreement Investigations

GAI was retained to perform phased investigations in accordance with the COA. The phased investigations were conducted at the site to gain a better understanding of groundwater conditions. Numerous investigative activities were performed over an approximate five-year period by GAI. The investigations performed and results of the investigations were provided in three separate reports:

- Final Report, Phase I Ground Water Evaluation, Jefferson Plant, West Elizabeth, PA (GAI, 1991);
- Phase II Assessment Report, Jefferson Plant, West Elizabeth, PA (GAI, June 1993); and
- Phase II Addendum Assessment of Conditions, Jefferson Plant, West Elizabeth, PA (GAI, October 1996).

An overview of the GAI phased investigations is as follows:

1990 Phase I Groundwater Investigation: Several groundwater investigations were completed by GAI in 1990. During the 1990 investigations, 18, two-inch inside diameter (I.D.) piezometers (E-1 through E-18) were installed in the shallow unconsolidated aquifer, 14 staff gauges (X-1 through X-14) were established along the unnamed tributary, measurement of groundwater and LNAPL levels were made at 30 monitoring well locations, and falling head slug tests were also performed at 30 monitoring well locations to obtain K values. The piezometer and staff locations are provided on Figure 3. Groundwater samples collected during 1990 were analyzed for constituents identified in the COA, which included benzene, toluene, xylenes, total organic carbon (TOC), total organic halogens (TOX), phenols, iron, sodium, manganese, sulfate and chloride, pH, and specific conductance. Ethylbenzene and styrene were also included as part of the groundwater analytical program though these constituents were not identified as COC in the COA. LNAPL samples were collected from wells containing measurable product and were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), TOX, flash point, and heating value.

1992 Phase II Investigation: Phase II investigations were initiated in 1992 by GAI and involved installing six additional wells (E-23 through E-28) and replacing one existing well (W-21A1). Wells E-19 through E-21 were installed by Environmental and Resources

Management in November and December 1991 as part of investigations in the Lower Plant Area and unrelated to investigations performed by GAI. Figure 3 shows the locations of the wells. Rising head slug tests were performed on each of the newly installed wells (E-19 through E-28 and W-21A).

Quarterly groundwater sampling and measurements of groundwater, surface water levels, and LNAPL thickness were initiated in July 1992. Initially, groundwater was sampled in 26 wells and 1 manhole, surface water and sediment sampled at 2 locations (X-2 and X-14), and product sampled in 4 wells. By the fourth quarterly event (April 1993), groundwater was sampled at 30 shallow wells, 6 deep wells, and 1 manhole. Surface water and sediment samples were also collected. The number and location of surface water and sediment samples remained constant during the first and second quarterly events; however, two background sediment samples were collected during the third quarterly event (January 1993). After the second quarterly event, product samples were not collected. The groundwater and surface water samples were analyzed for BTEX, styrene, TOC, TOX, and phenol. The sediment samples were analyzed for total petroleum hydrocarbons (PHC). The results of the findings were provided to the PADEP in 1993 (GAI, 1993).

1993 to 1996 Investigations: Numerous activities were conducted from 1993 to 1996 to further assess site groundwater quality and flow conditions. The groundwater assessment activities included the following:

- Continuation of the groundwater sampling and analytical program on a quarterly basis from July 1992 to April 1993;
- Continuation of water level and LNAPL thickness measurements on a quarterly basis from July 1993 to April 1996;
- Annual groundwater sampling of monitoring wells from October 1993 to October 1995;
- Sampling of select wells in October 1994;
- Sampling surface water at the unnamed tributary upstream and downstream locations quarterly from July 1992 to April 1993, and annually from October 1993 to October 1995; and
- Analyzing groundwater and surface water samples for BTEX, styrene, total phenolics, TOC, and TOX.

Additional borings were drilled to investigate the top of clay and/or facilitate placement of monitoring wells to further define groundwater impacts. The borings and wells drilled over the three-year period included 18 new wells (E-29 though E-33 and E-35 through E-47), 2 replacement wells (E-3A replacing E-3 and E-34 replacing W-17), and 5 soil borings (GAI-1 through GAI-5). Figure 3 shows the location of the monitoring wells. Rising head slug tests were also performed on 13 wells (E-30 through E-33, E-35, and E-37 through E-44).

An underground storage tank (UST) was identified immediately east of the Finished Products Warehouse (Figure 2). Four borings (GAI-2 through GAI-5) were advanced to investigate soil quality near the perimeter of the UST. Soil samples from borings GAI-2 through GAI-5 were composited for laboratory analysis of VOCs, PHC, and TOX. Two shallow groundwater monitoring wells (E-40 and E-41) and three deep wells (E-45 through E-47) were also installed to investigate groundwater quality downgradient at the UST. Well locations are included on Figure 3. Groundwater samples were collected from a total of 10 wells to assess groundwater quality in the vicinity of the UST. Three wells (E-24, E-40, and E-41) are shallow and located hydraulically downgradient from the UST and one well (E-29) is located north of the UST within close proximity to the Finished Products Warehouse.

3.1.3 Due Diligence Investigations

In 2000, two due diligence investigations were performed in anticipation of Hercules Incorporated selling the plant to Eastman. KU performed a due diligence investigation in the former PICCO resins plant formerly operated jointly as HSI. ARCADIS performed investigations in the remaining plant areas.

2000 ARCADIS Investigation: The ARCADIS investigations were conducted in October and November 2000. The investigations focused on assessing groundwater, soil, surface water, and sediment quality. A total of 46 soil samples were collected from 28 soil boring locations (SB-F1 through SB-F28). A total of 38 groundwater samples were collected from 15 existing monitoring wells (W-1A, W-2A, W-15, E-4, E-24, E-27, E-29, E-33, E-34, E-35, E-37, E-38, E-43, E-46, and MW-3), 6 newly installed wells (MW-F1 through MW-F5, and MWD-F1), and 17 newly installed temporary wells

(SB-F7 through SB-F19 and SB-F21 through SB-F23) (Figure 10). A total of five surface water/sediment samples (SD-F1/SW-F1 through SD-F5/SW-F5) and one composite sediment sample were collected from the unnamed tributary (Figure 10).

Each of the soil samples collected was analyzed for select VOCs, semivolatile organic compounds (SVOCs), inorganics (metals), pesticides/herbicides, and polychlorinated biphenyls (PCBs). Groundwater and surface water samples were analyzed for the same select list of parameters as the soil. Sediment samples were analyzed for VOCs, SVOCs, and metals. One composite sediment sample was collected and analyzed for pesticides/herbicides and dioxins/furans.

2000 KU Investigations: The KU investigations were focused to the Lower Plant Area on property formerly owned by HSI and commonly referred to as the PICCO resins plant. The KU investigations were performed in October and November 2000. The KU investigations focused on assessing soil and groundwater quality on the former HSI property. A total of 10 soil borings (B1 through B10) were drilled and 9 soil samples collected, while groundwater samples were obtained from 8 monitoring wells and manholes (E-31, W-2A, E-37, E-39A, E-28D, MH-3, MH-4, and MH-5). Figure 11 shows the boring and monitoring well locations completed during the KU investigation.

3.2 ANNUAL GROUNDWATER MONITORING

In accordance with the COA, Eastman monitors groundwater on an annual basis. The annual groundwater monitoring program consists of measuring groundwater and LNAPL levels in site wells and measuring surface water levels at various staff gauges established on the unnamed tributary and the Monongahela River. In addition, organic vapor measurements are also made at each well location upon opening the well cap.

3.3 WELL REPLACEMENT AND ABANDONMENT

In December 2001, the 17 temporary wells (Figure 10) installed by ARCADIS were either converted to permanent monitoring wells (11 wells) or abandoned (6 wells). The temporary wells were converted to permanent wells by removing or overdrilling the temporary well casing to facilitate placement of a two-inch I.D. polyvinyl chloride (PVC) monitoring well using 4¼-inch I.D. hollow-stem augers. Each well was completed by placing a sand pack around the well screen to a height of approximately two feet above the screen followed by an approximate two-foot bentonite seal and cement grout to ground surface. A protective casing was also installed around each well. The new permanent wells were also surveyed to aid in the determination of groundwater elevations.

3.4 INTERIM REMEDIAL MEASURES

Hercules Incorporated has undertaken numerous remedial projects in an effort to mitigate discharges to the Monongahela River and the unnamed tributary, and to minimize the potential for future accidental releases to the environment. The following subsections provide an overview of the remedial projects completed by Hercules Incorporated/Eastman.

3.4.1 Interceptor Trenches

As previously discussed, two interceptor trenches, the LPIT and the UCIT, were installed to mitigate discharges to the Monongahela River and the unnamed tributary. Figure 3 shows the location of the LPIT and UCIT, and Figure 12 shows a cross-sectional view of the LPIT and UCIT relative to the unnamed tributary and the Monongahela River. Each is discussed in the following paragraphs.

Under Creek Interceptor Trench: The UCIT represented the preferred remedial alternative to mitigate discharges to the unnamed tributary in the northwestern Lower Plant Area and northern C5 Plant Area (Figure 2). The UCIT extends from the culvert outlet from Jorgy's Pond to Second Street (Figure 3). The UCIT was installed in 1995 and has an approximate length of 550 feet.

The design of the UCIT includes a barrier and appurtenances installed that provide a means to recover groundwater and LNAPL prior to reaching the unnamed tributary to the Monongahela River. The UCIT was constructed within the unnamed tributary stream channel and involved placing two, six-inch I.D. high-density polyethylene (HDPE) pipes within sub-grade material and covering with a 60-mil HDPE liner. The purpose of the HDPE liner is to provide an impermeable barrier between discharging groundwater and surface water. Fill material was placed over the HDPE to restore the stream bottom.

Four manholes (MH-A through MH-D) were installed and connected with HDPE piping. Water from the UCIT is pumped to the waste water treatment plant which is located to the east of the trench. Groundwater withdrawal from the UCIT is controlled automatically by using a float switch on the evacuation pump in Manhole A. Hydraulic control between surface water and groundwater is not required for the UCIT. Figure 12 provides the construction details of the UCIT.

Lower Plant Interceptor Trench: Investigations in the 1980s were performed to identify the extent of groundwater impacts and gather data to evaluate remedial technologies to mitigate LNAPL seeps to the Monongahela River in the Lower Plant Area. Based on the evaluation of existing data and site hydrogeologic conditions, an interceptor trench was selected as the preferred remedial technology to mitigate discharges to the Monongahela River. The COA specifically identified installation of the LPIT.

The LPIT was installed in the eastern limits of the Lower Plant Area along the western bank of the Monongahela River (Figure 3). Installation of the LPIT was initiated in 1988 and began operating in 1990 (GAI, 1996). The original LPIT length was 575 feet, which was extended approximately 55 feet in 1997. The trench is approximately 630 feet long and attains an approximate maximum depth of 25 feet at Manhole MH-3 (Figure 12). Design groundwater flow to the trench was estimated at 15 to 50 gpm. Five, four-foot I.D. manholes interconnected with a six-inch I.D. HDPE perforated pipe (MTR, 2003) are installed within the trench (Figure 12). Of the five manholes, one manhole (MH-3) serves as the collection point while the remaining manholes act as observation points (Weston, 1986). Pumps were installed in each manhole. A water treatment system consisting of a pre-engineered building, oil/water separator, one carbon adsorption system containing two carbon beds, and one oil decanter was also installed to treat groundwater and LNAPL collected from the LPIT. The treated effluent is either reused or discharged to the local POTW.

The trench is operated on a regular basis with the goal of preventing the flow of groundwater and LNAPL from the site to the Monongahela River. The amount of water pumped from the LPIT is dependent on the river level since a hydraulic connection exists between groundwater and surface water. Pumping from the LPIT is controlled primarily by automatic float switches which help maintain a constant water level in the LPIT.

3.4.2 Jorgy's Pond

Jorgy's Pond is characterized as an open area of the unnamed tributary located in the Upper Plant Area (Figure 3). Groundwater and light PHC seeps are visible on the northern banks of Jorgy's Pond. To minimize the impacts of discharges to surface water in Jorgy's Pond, Hercules Incorporated installed a gooseneck structure that permits the flow of water while slowing the passage of LNAPL or sheens downstream. LNAPL and sheens that accumulated on the water surface were manually removed in the past.

The current discharge configuration has been effective in minimizing the discharge of LNAPL and sheens to downstream sections of the unnamed tributary and ultimately the Monongahela River. Currently, a remedial alternative for Jorgy's Pond is being designed to further minimize the discharge of LNAPL to the unnamed tributary to the Monongahela River.

3.4.3 LNAPL Collection

Since 1994, Hercules Incorporated and Eastman have removed LNAPL from select site monitoring wells. The wells currently targeted for LNAPL removal are based on LNAPL observations made in site monitoring wells in December 2001. With the exception of W-7, and where multi-year data exist, the general trend indicates a decrease in LNAPL recovered over time for Wells W-2A, E-6, E-25, and E-36. The current LNAPL removal program involves removing LNAPL from eight wells (W-7, W-18A, E-6, E-26, E-30, E-33, E-36 and E-43). LNAPL was not observed in Wells W-7, E-33, and E-43 during the Cummings/Riter site investigation. LNAPL is also removed indirectly through operation of the UCIT and LPIT systems. However, no measurements of the quantity of LNAPL removed by pumping from the trenches have been obtained historically during operation of these systems.

3.4.4 Facility Upgrades

Since 1988, Hercules Incorporated and Eastman have undertaken numerous activities to upgrade the facility infrastructure minimizing the release of constituents to the environment and to be in compliance with various federal, state, and local regulations. The major facility upgrades occurred in the late 1980s, mid 1990s, and late 1990s, and are currently ongoing.

During the late 1980s, a systematic program was started to identify areas of potential inadequacies followed by developing solutions to address the inadequacies and ultimately correcting the inadequacies identified. Internal assessments prepared by Hercules Incorporated in the late 1980s identified eight separate areas that required upgrades. These areas included groundwater contamination, spill containment, storage tanks, waste water treatment plant, air emissions, tank foundations, storm water control, and waste water pretreatment plant upgrade. The projects implemented and completed are numerous and the details associated with the projects are beyond the scope of this report. However, examples of some of the work completed during the 1980s include the following:

- Upgrading and installing concrete dike walls;
- Upgrading and installing new spill containments areas;
- Installing earthen dikes along the unnamed tributary and Monongahela River;
- Waste water treatment plant instrumentation and filter cake process upgrades;
- Installation of concrete foundations at various tank locations;
- Installation of concrete floors in process areas; and
- Installation of sumps and pumps in process areas.

From the mid-1990s to the present, Hercules Incorporated and Eastman implemented a three-phase spill containment program that identified various plant areas requiring upgrades or the addition of structures that would minimize potential releases to the environment. In concept, the spill containment program was similar to the program implemented in the late 1980s in that structures would be installed at various plant locations to minimize the potential for release to the environment. Examples of some of the projects include the installation of curbing, sumps, roofs (to divert rain water), the sealing or upgrading of spill containment structures, the addition of secondary containment structures, and placement of drip pans. The spill containment program addressed numerous site areas.

In 2001, Eastman completed a tank prioritization model that established an inspection schedule for large ASTs over a 10-year period ending in 2011. As part of this program, Eastman is also upgrading its ASTs. The upgrades include repair of the tank shell if necessary, inspection of the concrete floor and replacement or repairs if necessary, and installation of leak detection (MTR, 2003).

3.4.5 Underground Storage Tank Closure

A UST was discovered in the early 1990s during the Phase II activities near the Finished Products Warehouse (Figure 2). The UST was not related to Hercules Incorporated's operations, but rather to a former property owner prior the Hercules Incorporated ownership. The UST is approximately 32 feet long, 8 feet in diameter, and has approximately 12,000 gallons of capacity (GAI, 1996). The top of the UST is believed to be approximately 10 feet bgs (GAI, 1996). A 2-foot wide manhole opening extends approximately 2 feet above ground surface along with an 8-inch vent pipe and inlet pipe. Approximately 1,300 gallons of sludge were estimated to remain in the bottom of the UST (GAI, 1996). Due to the UST's close proximity to the Finished Products Warehouse, an in-place closure was performed. The UST in-place closure was performed in June 2002 under PADEP's Reference Document No. 02-19323. Closure consisted of removing the sludge and debris, filling with concrete, and welding pipe orifices. Approximately 2,000 gallons of sludge was removed. The sludge was characterized as non-hazardous, and transported to Waste Management, Inc.'s American Landfill located in Waynesburg, Ohio on July 19, 2002 for solidification and disposal.

4.0 SITE CHARACTERIZATION

As part of the RI Report, soil and groundwater analytical data collected during the due diligence investigations by ARCADIS and KU in 2000 and by Cummings/Riter in November 2003 through March 2004 were compared to applicable Act 2 standards. Criteria for characterization of soils and groundwater are the PADEP Act 2 statewide health, non-residential, medium-specific concentration (MSC) standards. Soil criteria used in this comparison were the statewide health, direct-contact MSCs for non-residential properties (surface and subsurface categories) and the soil-to-groundwater MSCs (the higher of the generic values or 100 times the groundwater MSC) for non-residential, used aquifers, with total dissolved solids (TDS) ≤ 2,500 milligrams per liter (mg/l).

Groundwater results were compared to non-residential, used aquifer MSCs (TDS ≤ 2,500 mg/l). Surface water results were compared to the most stringent of the three criteria set by Pennsylvania Code, Title 25, Chapter 16 (PA Code, 2000). Sediment results were compared to the analytical results from the background sediment sample location. The background sediment sample location represents the farthest upstream sample location on site and is representative of background. Sediment sample analytical results were also compared to the U.S. Environmental Protection Agency (USEPA) Ecological Toxicity (Ecotox) Threshold Benchmark values in Superfund ecological risk assessments (USEPA, 1996).

Field forms including well development forms, well purging forms, sample collection reports, and chain-of-custody forms for samples collected by Cummings/Riter are presented in Appendix C. Additionally, laboratory analytical data reports (on compact disk) and data validation summary forms are presented in Appendix D

4.1 SOILS

The following subsections provide a summary of site characterization soil results as compared to applicable Act 2 MSCs.

4.1.1 Surface Soils

Two surface soil samples (SB-F8A and SB-F17A) were collected by ARCADIS and one surface soil sample (B-7) was collected by KU in 2000 as part of the due diligence investigations. The surface soil samples were analyzed for select VOCs, SVOCs, inorganics, and PCBs. **There were no exceedances of the applicable Act 2 direct-contact MSCs in the samples collected by ARCADIS and KU.** Sample B-7 collected by KU had soil-to-groundwater pathway MSC exceedances for 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, and ethylbenzene. Tables 3 and 4 provide a summary of the analytical results for the ARCADIS and KU surface soil samples, respectively. Surface soil sample locations from the ARCADIS and KU investigations are shown on Figures 10 and 11, respectively.

Surface soil samples (0 to 2 feet bgs) were collected from 26 borings advanced during the soil characterization conducted by Cummings/Riter in November and December 2003. Soil headspace readings for each sample were measured prior to sampling to assess the presence to VOCs. The surface soil samples were analyzed for Appendix IX VOCS, (including 1,2,4-TMB, 1,3,5-TMB, and *cis*-1,2-dichloroethene [DCE]), Appendix IX SVOCS, and Appendix IX inorganics. **There were no direct-contact MSC exceedances in the surface soil samples collected by Cummings/Riter.** There was one soil-to-groundwater pathway exceedance of the Act 2 regulatory limits for toluene in Sample C-4 (0 to 2 feet). Table 5 provides a summary of the surface soil analytical results from the Cummings/Riter site characterization investigation while Figure 13 shows the soil boring locations. Soil boring logs have also been provided in Appendix A.

4.1.2 Subsurface Soil

Subsurface soil samples were collected by both ARCADIS and KU as part of their due diligence investigations in 2000. A total of 34 subsurface soil samples (2 to 15 feet) were collected by ARCADIS and 10 subsurface soil samples were collected by KU. The subsurface soil samples were analyzed for select VOCs, SVOCs, inorganics, and PCBs. **There were no Act 2 direct-contact MSC exceedances reported for the ARCADIS and KU subsurface soil samples.** However, there were several Act 2 soil-to-groundwater MSC exceedances. Samples SB-F2/MW-F2A and SB-F3/MW-F3A collected by ARCADIS reported naphthalene concentrations exceeding the soil-to-groundwater MSC. Sample B1 collected by KU reported a benzene concentration, while

Samples B1, B5, and B6 reported 1,2,4-TMB and naphthalene concentrations above corresponding soil-to-groundwater MSCs. Also, Samples B1 and B5 reported 1,3,5-TMB concentrations above its corresponding soil-to-groundwater MSC. Tables 6 and 7 provide a summary of the analytical results for the ARCADIS and KU subsurface soil samples, respectively. Figures 10 and 11 show the ARCADIS and KU subsurface boring locations, respectively.

A total of 41 subsurface soil samples were collected by Cummings/Riter personnel during the 2003 to 2004 site characterization. A truck-mounted Geoprobe® was utilized to collect the subsurface soil samples using direct-push technology (DPT). Macro-core samplers with new acetate liners were advanced to collect the samples. Representative samples from each two-foot interval were placed into plastic sealable bags and were allowed to equilibrate for a minimum of five minutes. The soil samples were then screened for total organic vapors using a photoionization detector (PID) with a 10.2 electron volt (eV) lamp. A sample from the two-foot interval exhibiting the highest PID reading was collected and sent for laboratory analysis. If elevated PID readings were not detected in a sample, soil from the two-foot interval immediately above the water table was sampled and sent for laboratory analysis. The subsurface soil samples were analyzed for Appendix IX VOCS, (including 1,2,4-TMB, 1,3,5-TMB, and *cis*-1,2-DCE), Appendix IX SVOCS, and Appendix IX inorganics.

Analytical results for the subsurface soil samples were compared to the appropriate Act 2 standards. **There were no subsurface soil direct-contact MSC exceedances for VOCs, SVOCs, or inorganics. Furthermore, the detected concentrations of SVOCS and inorganics in subsurface soil samples did not exceed the soil-to-groundwater Act 2 MSCs.** Subsurface soil samples with reported exceedances of applicable soil-to-groundwater MSCs are summarized for specific COC as follows:

- 1,2,4-TMB – in Samples C-1 (17.5 to 19.5 feet bgs), V-1 (12.9 to14.9 feet bgs), and TF-5 (7.7 to 9.7 feet bgs);
- 1,3,5-TMB – in Samples C-1 (17.5 to 19.5 feet bgs), V-1 (12.9 to 14.9 feet bgs), and TF-7 (5.5 to 7 feet bgs); and
- Benzene – in Sample V-1 (12.9 to 14.9 feet bgs).

Table 8 provides a summary of the subsurface soil analytical results collected by Cummings/Riter while Figure 14 provides the subsurface boring locations with soil-to-groundwater MSC exceedances. Soil boring logs are presented in Appendix A.

4.2 GROUNDWATER

Compounds detected in groundwater samples have been (conservatively) compared to Act 2 used aquifer criteria. Currently, there is no on-site groundwater usage. Hercules Incorporated and Eastman are proposing to implement a deed restriction for groundwater usage at the Jefferson Plant. This restriction will limit groundwater usage for remediation/monitoring purposes only.

Groundwater samples were collected by ARCADIS and KU in 2000 as part of the due diligence investigations. A summary of the ARCADIS analytical results for groundwater and a comparison of groundwater results to Act 2 standards are provided in Table 9. The following table provides a summary of the groundwater MSC exceedances from the groundwater samples collected by ARCADIS in October/November 2000:

October/November 2000	Act 2 MSC (µg/l)	Number of Wells With Exceedances	Exceedance Wells	Range of Exceedances (µg/l)
VOCs (µg/l)				
1,1-Dichloroethane (DCA)	110	1	E-24	1,700
cis-1,2-DCE	70	2	E-24 and SB-F9	84 - 3,200
Benzene	5	7	E-27, MW-F4, MW-F5, SB-F18, SB-F22, W-2A, and W-15	17 - 6,200
Ethylbenzene	700	5	E-43, MW-F4, MW-F5, SB-F22, and W-15	790 - 19,000
Styrene	100	2	E-43 and MW-F4	460 - 2,300
Toluene	1,000	1	MW-F4	1,400
Trichloroethene (TCE)	5	2	E-29 and SB-F8	11 - 190
Vinyl Chloride	2	2	E-24 and SB-F9	2.4 - 360
Xylenes	10,000	1	W-15	15,000
SVOCs (µg/l)				
bis(2-Ethylhexyl)phthalate	6	1	MW-F3	6.9
Naphthalene	100	5	E-46, MW-F4, SB-F18, W-2A, and W-15	240 - 1,500

October/November 2000	Act 2 MSC (µg/l)	Number of Wells With Exceedances	Exceedance Wells	Range of Exceedances (µg/l)
Inorganics (total) (µg/l)				
Antimony	6	4	E-35, E-37, SB-F16, and SB-F21	6.9 - 14.0
Arsenic	50	3	E-37, SB-F16, and SB-F21	140 - 293
Barium	2,000	1	E-37	3,140
Beryllium	4	3	E-37, SB-F16, and SB-F21	14 - 29
Cadmium	5	1	E-35	17.2
Chromium	100	9	E-37, E-49, SB-F9, SB-F13, SB-F14, SB-F15, SB-F16, SB-F18, and SB-F21	163 - 1,400
Lead	5	17	E-27, E-29, E-33, E-35, E-37, E-38, SB-F8, SB-F9, SB-F10, SB-F13, SB-F14, SB-F15, SB-F16, SB-F18, SB-F19, SB-F-21, and SB-F22	5.2 - 504
Nickel	100	9	E-35, E-37, E-46, SB-F13, SB-F14, SB-F15, SB-F16, SB-F18, and SB-F21	122 - 1,190

The concentrations of nine constituents were found to exceed the applicable Act 2 standards in groundwater samples collected by KU in 2000. A summary of analytical results for groundwater and a comparison of groundwater results to Act 2 standards are provided in Table 10. The COC that exceeded corresponding Act 2 MSCs and the wells at which the exceedance occurred include the following:

- Antimony – Monitoring Well E-37;
- Arsenic – Monitoring Well E-37;
- Benzene – Monitoring Well W-2A;
- Chromium – Monitoring Well E-37;
- Lead – Monitoring Well E-37 and E-38;
- Naphthalene – Monitoring Wells E-31, E-38; and W-2A;
- 1,2,4-TMB – Monitoring Wells E-31, E-38, E-39A, and W-2A;
- 1,3,5-TMB – Monitoring Wells E-31, E-38, E-39A, and W-2A; and
- Zinc – Monitoring Well W-2A.

Cummings/Riter performed groundwater sampling during two events occurring from January 26 to February 5, 2004 and from March 1 to 2, 2004 at the Jefferson Plant. Prior to initiating groundwater sampling activities, a complete round of groundwater levels was measured at the site monitoring wells and piezometers. The depth to LNAPL and product thickness were also measured in the wells where LNAPL was observed. Table 2 provides a summary of the water levels/product thickness from two water level monitoring events. Potentiometric surface maps were constructed to depict groundwater flow in the shallow (Figures 6 and 7) and deep (Figures 8 and 9) unconsolidated groundwater zones for the two events.

During the first sampling event (January 26 to February 5, 2004), a total of 43 wells were sampled using low-flow purging and sampling techniques. The objective of the first sampling event was to confirm analytical results from the two due diligence investigations in 2000 (KU and ARCADIS).

Prior to the installation of five new deep groundwater monitoring wells in January 2004, there were limited data (analytical and water level) for the deep unconsolidated groundwater zone at the Jefferson Plant. A total of 13 deep wells were sampled during the second event. Additionally, three shallow unconsolidated groundwater zone wells (E-21, W-1A, and W-7) that could not be located during the first round of sampling due to snow and ice cover were also sampled during the second sampling event. The purpose of the second sampling event (March 1 to 2, 2004) was to provide additional analytical data for the deep groundwater zone, and collect samples from wells that could not be located during the first event.

The samples were analyzed for Appendix IX VOCs (including 1,2,4-TMB, 1,3,5-TMB, and *cis*-1,2-DCE), Appendix IX SVOCs, Appendix IX inorganics, and TDS. The Appendix IX inorganic samples were field filtered directly from the discharge tubing using a 0.45-micron filter; therefore, the analytical results represent the dissolved fraction of inorganics in groundwater. The following paragraphs summarize groundwater analytical results for the samples collected by Cummings/Riter with respect to Act 2 MSCs.

4.2.1 Volatile Organic Compounds

The concentration of select VOCs were found to exceed the applicable Act 2 used aquifer MSCs in samples collected from 11 wells during the first groundwater sampling event. Thirty-two of the wells sampled during the first event had no exceedances of the applicable Act 2 used aquifer MSCs. A summary of groundwater analytical results and comparisons to Act 2 standards are provided in Table 11. The constituents that were detected at concentrations exceeding corresponding Act 2 MSCs and the wells at which the exceedance occurred include the following:

- 1,2,4-TMB – Monitoring Wells E-43, E-31, E-33, W-15, E-56, MW-F2, and E-2;
- 1,3,5-TMB – Monitoring Wells E-43 and W-15;
- 1,1-DCA – Monitoring Well E-24;
- 1,1-DCE – Monitoring Well E-24;
- *cis*-1,2-DCE – Monitoring Well E-24;
- Acrolein – Monitoring Well E-49;
- Benzene – Monitoring Wells W-15, E-24, E-56, MW-F2, and E-27;
- Ethylbenzene – Monitoring Well W-15;
- Tetrachloroethene (PCE) – Monitoring Well E-24;
- TCE – Monitoring Wells E-24; and E-29; and
- Vinyl chloride – Monitoring Well E-24.

During the second sampling event conducted by Cummings/Riter in March 2004, VOC concentrations exceeding Act 2 MSCs were reported for only one shallow monitoring well (W-7) of the 13 deep and 3 shallow wells sampled. Concentrations of 1,2,4-TMB, 1,3,5-TMB, and benzene in the sample from Monitoring Well W-7 exceeded corresponding groundwater MSCs. The VOC exceedances were observed in the perched and shallow unconsolidated groundwater zones. There were no Act 2 MSC exceedances for the deep groundwater zone. Monitoring well locations where VOCS were reported to exceed Act 2 MSCs are presented in plan view on Figure 15. Wells with measurable LNAPL are also shown on the map.

4.2.2 Semivolatile Organic Compounds

Seven SVOCs were detected at concentrations exceeding corresponding Act 2 used aquifer MSCs in samples from several monitoring wells during both groundwater sampling events performed by Cummings/Riter. The detected (or estimated) SVOCs include: 1,4-dioxane, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl) phthalate, dibenzo(a,h)anthracene, naphthalene, and pentachlorophenol. The following table summarizes the exceedances of the MSCs from the first sampling event:

January/February 2004	Act 2 MSC (µg/l)	Number of Wells With Exceedances	Exceedance Wells	Range of Exceedances (µg/l)
SVOCs (µg/l)				
1,4-Dioxane	24	1	W-15	26
Benzo(a)pyrene	0.2	3	W-15, E-45D, and W-2A	0.7J – 0.98J
Benzo(g,h,i)perylene	0.26	3	W-15, E-45D, and W-2A	0.99J – 2.5J
Bis(2-ethylhexyl)phthalate	6	1	E-13D	8.0J
Dibenzo(a,h)anthracene	0.36	2	W-15 and W-2A	0.99J – 2.1J
Naphthalene	100	3	E-43, E-31, and W-15	180 – 840
Pentachlorophenol	1	1	W-2A	5.6J

During the second sampling event, two constituents [benzo(g,h,i) perylene and dibenzo(a,h)anthracene] were reported as having MSC exceedances. Benzo(g,h,i) perylene was detected at concentrations exceeding its corresponding MSC in samples from Monitoring Wells E-59 and E-28D. Dibenzo(a,h)anthracene was detected at a concentration that exceeds its corresponding MSC in the sample from Monitoring Well E-28D. It is noted that the detections of benzo(a)pyrene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, and pentachlorophenol were qualified by the laboratory as estimated concentrations because the concentrations were reported between the reporting limit and the method detection limit (MDL).

Table 11 provides a summary of analytical results for samples collected by Cummings/Riter during this investigation. Figure 16 presents a plan view of SVOC exceedances reported for samples from perched and shallow unconsolidated groundwater monitoring wells collected by ARCADIS, KU, and Cummings/Riter.

4.2.3 Inorganics

Dissolved inorganics analyzed during the 2004 sampling events that exceeded the MSC consisted of arsenic, cadmium, nickel, and thallium. Dissolved arsenic was detected in one sample (from Monitoring Well E-62) at a concentration of 51 micrograms per liter (µg/l) during the March 2004 sampling event. This reported arsenic concentration exceeds the corresponding Act 2 MSC. Dissolved cadmium was detected in the sample from Monitoring Well MW-F3 collected in January 2004 at a concentration of 7.9 µg/l which exceeds its corresponding MSC. Dissolved nickel was detected in several groundwater samples at concentrations which exceed its corresponding MSC including: Monitoring Wells E-12 (110 µg/l in January 2004), E-46D (140 µg/l in the January 2004 results and 110 µg/l in the March 2004 results), MW-F3 (130 µg/l in January 2004), and E-47D (2,000 µg/l in March 2004). The sample collected in January 2004 from Monitoring Well MW-F3 also had a reported dissolved thallium concentration of 6.1 µg/l which exceeds its corresponding MSC.

A summary of analytical results for inorganic compounds are presented in Table 11. Figure 17 provides the location of inorganic exceedances (dissolved fraction) for the perched/shallow groundwater zone while Figure 18 provides the location of inorganic exceedances for the deep unconsolidated groundwater zone for samples collected by ARCADIS, KU, and Cummings/Riter.

4.3 SURFACE WATER AND SEDIMENT

Surface water samples were collected from five locations (SW-1 through SW-5) along the unnamed tributary to the Monongahela River (Figure 19) on December 8, 2003. The samples were collected directly from the vertical and horizontal midpoint of the unnamed tributary at each location and proceeded in order from the furthest downstream location (SW-5) to the furthest upstream location (SW-1) to minimize sample disturbance.

The surface water samples were analyzed for Appendix IX VOCS, (including 1,2,4-TMB, 1,3,5-TMB, and *cis*-1,2-DCE), Appendix IX SVOCS, and Appendix IX total inorganics. Surface water samples were compared to the most stringent Surface Water Criteria (fish and aquatic life, human health, and criteria maximum) as defined by Title 25, Chapter 16, Appendix A, Table 1.

Reported concentrations of toluene in samples from Surface Water Locations SW-4 and SW-5 (19,000 µg/l and 8,500 µg/l, respectively) and benzene in the sample from Surface Water Location SW-3 (1.7 µg/l) exceeded Chapter 16 surface water criteria. **There were no detected concentrations of SVOCs and inorganics that exceeded surface water**

criteria in any of the surface water samples collected during this investigation. Table 12 provides a summary of the surface water analytical results with a comparison to the applicable surface water criteria. Figure 19 presents the concentrations of detected VOCs, SVOCs, and inorganics in plan view for each surface water sample location.

Sediment samples were collected concurrently with the surface water samples from the midpoint of the stream channel. Sediment samples were analyzed for Appendix IX VOCS, (including 1,2,4-TMB, 1,3,5-TMB, and *cis*-1,2-DCE), Appendix IX SVOCS, and Appendix IX inorganics. Concentrations of VOCs, SVOCs, and inorganics were detected above MDLs in each of the five samples collected. Since MSCs have not been promulgated for sediment under the PADEP Act 2 program, sample results were compared to reported sample concentrations from Sediment Sample Location SD-1, which represents background sediment conditions. Furthermore, sediment sample results were compared to USEPA Ecotox Threshold Benchmark values in Superfund ecological risk assessments (USEPA, 1996).

Sample Location SD-1 is located where the unnamed tributary flows onto the 837 Tank Farm Area portion of the Jefferson Plant (Figure 20). Concentrations of detected COC in Sample SD-2 are similar to those detected in (background) Sample SD-1. Detected concentrations of VOCs and SVOCs in Sample SD-3 (Jorgy's Pond) show a substantial increase when compared to background (Sample SD-1) concentrations. Sample SD-4 had the highest detected VOC concentrations compared to the remaining sediment samples collected during this investigation. The VOC and SVOC concentrations reported in Sample SD-5 show a considerable decrease from those reported in Sample SD-4. The concentrations of inorganics are similar in the five sediment samples collected during this investigation. Table 13 presents a summary of the sediment samples results. Figures 20, 21, and 22 present the detected concentrations of VOCs, SVOCs, and inorganics in plan view, respectively.

As previously discussed, the sediment sample analytical results were also compared to the USEPA Ecotox Threshold Benchmark values. The following table summarizes the results of this comparison:

Parameter	Ecotox Threshold Value (µg/kg)	Sample Location	Detected Concentration[(a)] (µg/kg)
VOCs			
Toluene	670	SD-4 SD-5	310,000/430,000 1,200
Xylenes (total)	25	SD-3 SD-5	2,900 140J
SVOCs			
Benzo(a)pyrene	430	SD-1 SD-3 SD-4	610J 1,400J 560J
Fluoranthene	600	SD-1 SD-2 SD-3 SD-4	1,200J 1,000J 2,100J 960J
Naphthalene	160	SD-4	710J/900J
Phenanthrene	240	SD-1 SD-3 SD-4	650J 480J 720J
Pyrene	660	SD-1 SD-2 SD-3 SD-4	1,100J 970J 2,200J 900J
INORGANICS			
Arsenic	8,200	SD-3 SD-5	10,000L 8,300L
Copper	34,000	SD-2 SD-4	51,000L 35,000
Nickel	21,000	SD-1 SD-2 SD-3 SD-4 SD-5	34,000 55,000 29,000 26,000 27,000
Zinc	150,000	SD-2 SD-3 SD-4	210,000K 160,000 180,000

NOTE:
(a) Data qualifiers include: J = estimated value; L = positive result is biased high; and K = positive result is biased low.

As shown, the majority of the Ecotox exceedances are found at Sediment Sample Locations SD-3 and SD-4. Also, there were several Ecotox exceedances at the Sediment Sample Location SD-1, which represents background conditions for the site.

4.4 Indoor Air

Indoor air quality samples were collected to assess the potential of vapor intrusion to indoor air based on the presence of LNAPL associated with shallow groundwater in the vicinity of several buildings at the Jefferson Plant. According to the "*Land Recycling Program Technical Guidance Manual – Section IV.A.4. - Vapor Intrusion into Buildings from Groundwater and Soil Under the Act 2 Statewide Health Standards,*" (PADEP, 2004), if LNAPL in encountered within 100 lineal feet of an occupied building, indoor air sampling and/or soil gas sampling is required to assess the vapor intrusion pathway.

Indoor air samples were collected from five buildings including: V-8 Control Building, W.W. Poly, M.P. Poly, Pilot Plant Building, and C5 Plant (Figure 23). These buildings were selected for indoor air sampling due to the building being located in areas of known LNAPL. Air samples were collected using Summa® canisters with flow controllers (provided by the laboratory) and were deployed over an eight-hour period. The indoor air samples were analyzed for BTEX, styrene, and naphthalene.

Air readings using a PID (10.2 eV lamp) were measured outside and inside buildings prior to canister deployment to establish background air quality readings and to provide real-time data. Although the PID can only provide a reading for a range of compounds, the data was useful in determining if VOCs were present at the time of sampling.

VOCs were detected with the PID both inside and outside of buildings prior to, during, and after the testing period at several buildings in the investigation including W.W. Poly, M.P. Poly, and Pilot Plant Buildings. The parameters selected for laboratory analysis for the air samples were the same as the constituents that Eastman currently uses at the Jefferson Plant. The possibility exists for the vapors produced by manufacturing processes to interfere with any concentrations possibly caused by vapor intrusion to indoor air. An ambient air sample was collected outside of the M.P. Poly Building to measure potential interference from extraneous sources. The ambient air field blank sample was collected concurrently with the indoor air samples to provide background concentrations. The ambient air sample canister was deployed on the upwind side of the M.P. Poly Building at the time of sampling (Figure 23).

The results of the indoor air samples were compared to exposure standards and guidelines set by the Occupational Safety and Health Administration (OSHA). Specifically, OSHA Permissible Exposure Limits (PELs) were used to evaluate the results since OSHA regulates operations at the Jefferson Plant. Compounds that were detected in concentrations above the MDLs include: ethylbenzene, toluene, xylenes, and styrene. **The detected concentrations for the indoor air samples did not exceed corresponding OSHA PELs.** Also, detected concentrations in the ambient air sample were similar to those detected in the indoor air samples. This demonstrates that compounds detected in the indoor air samples can be attributed, in part, to site operations rather than vapor intrusion to indoor air from subsurface contaminants. A summary of the indoor air analytical results is provided in Table 14. Figure 23 shows the locations of the indoor air samples and their corresponding detected concentrations.

4.5 GROUNDWATER FLOW ASSESSMENTS

4.5.1 Under Creek Interceptor Trench Assessment

A groundwater flow assessment was performed at the UCIT on February 4 and 5, 2004. Figure 3 provides the locations of the UCIT and the access manholes located along the UCIT. The submersible pump located in Manhole MH-A was turned off 24-hours prior to the initiation to the assessment to allow enough time for groundwater levels to equilibrate to static conditions. The submersible pump is used to evacuate water and/or free product (LNAPL) from the UCIT and transfer it to the plant water treatment building where it is subsequently treated. A round of water levels in wells and piezometers (in both the shallow and deep unconsolidated groundwater zones) in the immediate vicinity of the UCIT was collected prior to the start of the flow assessment. The water level in the adjacent unnamed tributary was also monitored during the assessment. The flow assessment was initiated after water levels were measured and the submersible pump in the UCIT was restarted.

Water levels in the 4 UCIT manholes (MH-A, MH-B, MH-C, and MH-D), 21 assessment wells (E-8D, E-9, E-13D, E-14, E-15, E-16, E-17D, E-18, E-26, E-29, E-32, E-33, E-35, E-40, E-43, E-47D, E-54, E-60, E-61, W-10, and W-21A), and 2 piezometers (LP-2 and LP-5) were measured approximately every $1^1/_2$ hours during the first seven hours of the flow assessment. The flow rate of the pump was adjusted by Eastman personnel to approximately 13.5 gallons per minute (gpm). This flow rate was the maximum pumping rate that could be used without exceeding the capacity of the treatment system. According to Eastman personnel, 13.5 gpm is the typical pumping rate that is used to remove water from the UCIT; therefore, the flow assessment is representative of normal pumping conditions for the UCIT.

Steady state conditions had not been achieved after pumping for approximately eight hours; therefore, the flow assessment testing period was continued. Assessment well water levels were measured after approximately 24 hours of pumping. These levels were compared to the last round of measurements collected the previous day and indicated that the water levels in the wells continued to decrease overnight. The final round of assessment well water levels were measured approximately 29 hours after initiating the test and were compared to the 24-hour levels. Water levels from the two rounds were similar; therefore, it was interpreted that steady state conditions had been achieved.

The maximum drawdown during the investigation observed at pumping location (MH-A) was 1.62 feet. Pumping at the UCIT influenced water levels in the shallow unconsolidated groundwater zone. The maximum drawdown was primarily observed in wells/piezometers located east of the UCIT. With the exception of Piezometer LP-2 located north of the UCIT, shallow wells upgradient (north) of the UCIT showed little to no response to pumping. The UCIT also influenced several of the deep groundwater monitoring wells that were included in the assessment. These observations demonstrate that the UCIT is working as it was designed by preventing the communication between the unconsolidated groundwater zone and the tributary.

Figure 24 shows the total drawdown in the shallow unconsolidated groundwater zone wells included in the UCIT assessment. Table 15 provides a summary of select C5 Plant and Lower Plant Areas well and piezometer water levels and corresponding drawdown values measured during the UPIT flow assessment.

UCIT

4.5.2 Lower Plant Interceptor Trench Assessment

A groundwater flow assessment was performed at the LPIT on March 18 and 19, 2004. Figure 3 provides the locations of the LPIT and the access manholes located along the LPIT. The collection piping in the LPIT is designed to collect water from the perched groundwater zone in the Lower Plant Area. The collection piping is also constructed such that water collected by the trench flows to Manhole MH-3. The submersible pump in Manhole MH-3 is then used to remove water and/or free product from the LPIT and transfer it to an equalization tank. From the equalization tank, the water is pumped to the on-site water treatment plant where it is treated and either reused or discharged through a National Pollutant Discharge Elimination System (NPDES)-permitted outfall to the local POTW. The LPIT is designed to be in communication with the perched groundwater zone that exists in the Lower Plant Area.

Approximately 24 hours prior to the initiation of the LPIT test, the collection pump located in Manhole MH-3 was turned off to allow groundwater levels to equilibrate. A round of water levels in Monitoring Wells E-21, E-22, E-28D, E-30, E-31, E-34, E-59, W-1A, W-2A, W-7, W-10, W-15, and MW-F3 and Piezometers LP-6, LP-7, LP-8, and LP-9 (screened in the perched, shallow, and deep groundwater zones) in the Lower Plant Area were measured prior to the start of the LPIT flow assessment. The water level in the Monongahela River was also monitored during the test at Staff Gauge X-0. The water level in the Monongahela River was higher than normal due to recent precipitation events, but below flood stage level. The flow assessment was started after the water level measurements were completed and the submersible pump in Manhole MH-3 was restarted.

Water levels in the assessment wells were measured approximately every two hours after the start of the test for the initial eight hours. The flow rate of the pump was adjusted by Eastman personnel at the start of the test to approximately 15 gpm. The pump was also set on automatic mode during the flow assessment to ensure that it would function over the duration of the test. According to Eastman personnel, 15 gpm represents the normal pumping rate that is used to remove water from the LPIT. Therefore, the LPIT flow assessment was considered to be representative of normal pumping conditions.

Steady state conditions had not been achieved after pumping for approximately eight hours; therefore, the flow assessment testing period was continued. A round of water levels was measured in the wells included in the LPIT flow assessment approximately 24 hours after pumping began. These levels were compared to the round of measurements collected after eight hours of pumping and indicated that the water levels continued to decrease. The final round of assessment well water levels was measured approximately 26 hours after pumping began and was compared to the water levels after 24 hours of pumping. Water levels from the two rounds were similar indicating that steady state conditions had been reached.

The maximum drawdown during the investigation observed at the pumping location (MH-3) was 4.86 feet. The pumping of the LPIT influenced the water levels in wells monitoring the perched groundwater zone with the maximum drawdown observed to the northwest. Figure 25 shows the total drawdown (in feet) for groundwater levels in the shallow wells, piezometer, and manholes included in the LPIT assessment. There was no noticeable drawdown in the two deep wells (E-28D and E-59) monitored during the test. Table 16 provides a summary of Lower Plant Area well and piezometer water levels and drawdown values during the LPIT flow assessment.

4.6 Storm Sewer Groundwater Infiltration Investigation

Two storm sewers (discussed in Section 2.4.4) are present from the eastern limits of the 837 Tank Farm Area at State Route 837 to Jorgy's Pond (Figure 26). A video inspection and pipe cleaning effort was conducted on November 12, 13, and 18, 2003. During the videotaping, multiple groundwater infiltration points (cracks and holes) were observed in the 36-inch and 24-inch sewers. Also, sheens on the water entering the two storm sewers were observed. A letter report containing the findings of the storm sewer videotaping/cleaning is included in Appendix A.

As a result of observations during the videotape inspection, Cummings/Riter and Robinson Pipe Cleaning Company (RPC) conducted surface water sampling on March 2, 2004 at various points along the 36-inch storm sewer to aid in determining the possible location(s) of groundwater infiltration. A surface water sample was collected from a location immediately before the unnamed tributary to the Monongahela River enters the 36-inch sewer. Surface water collected from this sampling location was noted as being clear and absent of an oil sheen.

An additional surface water sample was collected from the 36-inch culvert immediately prior to where it discharges into Jorgy's Pond. Surface water collected from this sampling point was described as having a noticeable sheen. A culvert located in the Upper Plant Area adjacent to a service point for the 36-inch culvert was also sampled. From observations made during the video inspection, water from this culvert appears to flow into the larger 36-inch storm sewer at the service point. A sheen was also observed on the water at this location at the time of sampling. The surface water samples were analyzed for Appendix IX VOCs (including 1,2,4-TMB, 1,3,5-TMB, and *cis*-1,2-DCE), Appendix IX SVOCs, and Appendix IX inorganics (total fraction only).

During a previous video inspection, water was observed entering the 36-inch culvert through a crack located approximately 131 feet downstream from the 36-inch pipe entrance, on the southern side of Route 837. RPC, under the direction of Cummings/Riter, attempted to sample this infiltration point; however, at the time of sampling, water was not flowing from this infiltration into the storm sewer and, therefore, a sample could not be collected.

Analytical results for the three surface water sampling locations indicate that impacted groundwater is infiltrating into the 36-inch culvert. Analytical results from the influent sampling location (36-inch Pipe Influent) did not report detectable concentrations of VOCs and SVOCs. The sample collected from the service point contained concentrations of VOCs and SVOCs, while the sample collected near the discharge point also had detectable VOC and SVOC concentrations, but at levels less than those reported for the sample collected at the service point. Table 17 provides a summary of the analytical results for the samples collected from the 36-inch culvert. Along with a comparison of the most stringent PADEP statewide surface water criteria (fish and aquatic life, human health, and criteria maximum) as defined by Title 25, Chapter 16, Appendix A, Table 1. Figure 26 shows the sample locations.

5.0 SOURCE AND IDENTIFICATION OF CONSTITUENTS OF CONCERN

As mentioned in Section 4.1, there were no soil direct-contact exceedances identified in the samples collected at the Jefferson Plant. Soil COC (with regard to the soil-to-groundwater pathway) consist of 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, toluene, and naphthalene. Groundwater COC consists of 1,2,4-TMB, 1,3,5-TMB, 1,1-DCA, 1,1-DCE, *cis*-1,2-DCE, arcolein (propenal), benzene, ethylbenzene, styrene, PCE, TCE, vinyl chloride, o-xylene, 1,4-dioxane, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl) phthalate, dibenzo(a,h)anthracene, naphthalene, pentachlorophenol, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, nickel, thallium, and zinc. Surface water COC consist of benzene and toluene.

As previously discussed, the source of COC is believed to have occurred from a number of potential sources related to improper material handling and accidental releases. Potential source areas within the Jefferson Plant property were identified as a result of the GAI Phase II investigations. Three source areas include the 837 Tank Farm Area, Jorgy's Pond Area, and the Lower Plant Area. The 837 Tank Farm Area currently contains eight ASTs with each AST surrounded by earthen containment berms. There are also conveyance lines leading from the 837 Tank Farm Area, beneath Route 837, to the Upper Plant Area. Concentrations of 1,2,4-TMB, 1,3,5-TMB, and BTEX have been detected in soils and groundwater in the 837 Tank Farm Area. Also, Monitoring Well MW-F4 contains the presence of LNAPL.

A second source area has been identified near Jorgy's Pond. Several monitoring wells located in the central portion of the site contain LNAPL. Monitoring wells in the Upper Plant Area (including E-6, E-26, E-36, W-18A, and MW-F5) have detected LNAPL ranging from a sheen to several feet thick. Also, previous investigations in the Jorgy's Pond Area have reported elevated concentrations of BTEX and impacted seeps have been observed discharging into the pond.

A third source area likely exists in the Lower Plant Area. A number of ASTs are located in this area. Monitoring Well E-30 contains LNAPL, and prior to the implementation of remedial measures (e.g., the LPIT), Well W-7 had previously reported a detectable thickness of LNAPL. LNAPL has also been encountered in soil borings in the Lower Plant Area.

A chlorinated VOC source has been identified in the Finished Products Warehouse Area. The source area is believed to be located in the northern portion of the area based on groundwater and soil analytical results. Higher concentrations of chlorinated VOCs were detected in groundwater in the northern portion of the area, while chlorinated VOC daughter products have been detected in groundwater in the southern portion (downgradient) of the area. The presence of daughter products indicates that natural attenuation processes are likely to be occurring in this area.

6.0 POTENTIAL PATHWAY IDENTIFICATION AND EVALUATION

The identification and evaluation of potential pathways with respect to COC are included in this section pursuant to the Act 2 TGM. The identification process describes potential sources, pathways, and receptors in the absence of institutional or engineering controls. These potential pathways are then evaluated to determine whether impacted media meet applicable Act 2 statewide health standards for characterization purposes.

6.1 POTENTIAL PATHWAY IDENTIFICATION

The following discussion of the potential pathway identification has been modified from the description presented in the DOCC and Work Plan (MTR, 2003).

Factors analyzed in the identification of pathways include source areas, migration routes, receptors, and exposure pathways. Potential source materials at the Jefferson Plant consist of COC identified in site media as described in Section 4.0. Soil, surface water, sediment, and groundwater represent potential source media since investigations have indicated that site-related activities have impacted these media. Constituent migration in soil and groundwater may occur to other environmental media through various migration pathways. Potential migration pathways to ambient air from impacted soils include transport via fugitive dust generation (e.g., wind erosion, vehicle traffic, or excavation) and constituent volatilization (including indoor air). COC migration from soil to groundwater could occur through constituent leaching and infiltration through unsaturated soils to groundwater. Once in groundwater, the COC can migrate advectively via groundwater flow to discharge points (i.e., surface water) or migrate to indoor air through volatilization. A potential pathway exists from soils to surface water and sediment via the transport of impacted soil particles by storm water runoff to surface water bodies. Impacted sediments can also act as a continuing source for surface waters.

Based on the potential source media and migration pathways identified above, the potential on-site exposure media for the plant includes surface and subsurface soil (various plant areas), site-wide groundwater, outdoor air particulate and volatile emissions, indoor air volatile emissions, and surface water and sediment in the unnamed tributary and Jorgy's Pond.

6.1.1 Potential Receptors and Exposure Pathways

The current and expected future site use is industrial and the potential receptors were based on the current and expected future use of the site. In the event that future site use is changed, then an updated evaluation of potential receptors would be required. Based on the current and expected future use, the likely human receptors include full-time plant workers (both outdoors and indoors), and construction or utility maintenance workers present on an infrequent or short-term basis. The plant worker is not expected to be involved in any intrusive subsurface activities, while the construction or utility worker may be involved in excavation-type work. Visitors and trespassers are also potential receptors, but they would be present on such an infrequent basis (in comparison to workers) that quantitative assessment is not necessary.

Exposure pathways describe the constituent pathways from source media to the potential receptor. The following presents potentially complete exposure pathways based on receptors described above and current understanding of the site:

- **Plant Worker (Outdoor):** Incidental ingestion of surface soil, dermal contact with surface soils, inhalation of volatile and particulate emissions in outdoor air, incidental ingestion of surface water, dermal contact with surface water, incidental ingestions of sediment, and dermal contact with sediment;

- **Plant Worker (Indoor):** Inhalation of volatile emissions in indoor air; and

- **Construction or Utility Worker:** Incidental ingestion of surface and subsurface soil, dermal contact with surface and subsurface soil, and inhalation of volatile and particulate emissions in outdoor air.

Although direct contact with groundwater is possible by plant and construction/utility workers, it is not expected to be a significant exposure pathway. Workers potentially bailing LNAPL from wells could be exposed to groundwater, but these workers are assumed to conduct the activity using appropriate personal protective equipment (PPE).

In addition, groundwater pumped from the LPIT or UCIT and treated at the on-site treatment plant could be added to process waste water; however, contact with this water is extremely unlikely. For these reasons, direct dermal contact or incidental ingestion with groundwater is not expected to be significant. The only significant potential exposure pathway for chemicals in groundwater is inhalation of vapors that volatilize into indoor air.

6.1.2 Potential Future Exposure Pathways

Potential future exposure pathways and receptors are basically similar to the aforementioned current exposure scenario. However, potential future exposure pathways exist in addition to the current exposure pathways listed above. Direct contact with COC in groundwater by on-site workers could potentially occur in the future through ingestion or inhalation of volatilized constituents if an on-site groundwater supply well is constructed and used. The ingestion or inhalation of volatilized COC or fugitive emissions in ambient air by site workers may occur if subsurface soils are disturbed at the facility through redevelopment or renovation activities. Remediation of Jorgy's Pond is anticipated, and there is a potential for exposure to sediment and surface water by remediation workers. However, this activity would be of short duration, and the activities would be conducted using appropriate PPE and health and safety procedures. Evaluation of exposure to sediment and surface water by an outdoor plant worker will be of sufficient frequency and magnitude to address potential risks to other worker receptors.

6.2 POTENTIAL PATHWAY EVALUATION

The following paragraphs evaluate each pathway identified as they apply to site media (i.e., soils, groundwater, surface water, and indoor air). The evaluation determines whether COC present in existing pathways exceed applicable statewide health standards for characterization purposes or if the pathway elimination component of the site-specific standard can be used. Section 4.0 provides an overview of current environmental conditions at the Jefferson Plant as compared to statewide health MSCs.

6.2.1 Soils (Direct Contact)

Soil analytical results collected at the Jefferson Plant were compared to applicable MSCs for characterization purposes. The evaluation shows that there are no exceedances of statewide health direct-contact standards for surface and subsurface soils. Therefore, the direct-contact exposure pathway for surface and subsurface soils is insignificant and does not require further evaluation.

6.2.2 Soils (Soil-to-Groundwater Pathway)

As stated in Section 4.1.2, COC exceeding applicable soil-to-groundwater standards are 1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, toluene, and naphthalene. Therefore, the soil-to-groundwater pathway for these compounds is complete and requires further evaluation.

6.2.3 Groundwater

Groundwater COC consists of 1,2,4-TMB, 1,3,5-TMB, 1,1-DCA, 1,1-DCE, *cis*-1,2-DCE, arcolein (propenal), benzene, ethylbenzene, styrene, PCE, TCE, vinyl chloride, o-xylene, 1,4-dioxane, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, dibenzo(a,h)anthracene, naphthalene, pentachlorophenol, arsenic, cadmium, nickel, and thallium. As stated earlier, groundwater is currently not used at the Jefferson Plant. However, incidental contact with site groundwater may occur through subsurface disturbances during redevelopment or renovation activities if excavations were to proceed to the water table. To prohibit potential future pathway completion for on-site groundwater, institutional controls in the form of restrictive covenants prohibiting the on-site use of groundwater for purposes other than environmental monitoring and/or remediation will be implemented to eliminate the possibility of direct contact to existing or future tenants.

The UCIT and LPIT inhibit groundwater discharge to surface water in the unnamed tributary and the Monongahela River, respectively, at the Jefferson Plant. Fate and transport analysis was performed to assess theoretical concentrations of COC in groundwater associated with the perched, shallow, and deep unconsolidated groundwater zones of the Jefferson Plant. Section 6.3 provides a description of the fate and transport analysis and subsequent findings.

Surface water from two storm water culverts (which receive groundwater inflow) and perched groundwater (along with LNAPL seeps) provide baseflow to Jorgy's Pond. No attempt was made to model the groundwater impacts on Jorgy's Pond due to the presence of LNAPL. Also, groundwater samples were not collected from wells containing LNAPL, which included many of the wells in close proximity to Jorgy's Pond.

6.2.4 Surface Water and Sediment

As mentioned in Section 4.3, VOC exceedances in surface water exist on the Jefferson Plant property. The exceedances of benzene and toluene are believed to be a result of LNAPL seeps discharging to the unnamed tributary between Jorgy's Pond and the UCIT. To prohibit potential future pathway completion for surface water, a remedial alternative is currently being designed for Jorgy's Pond and the surrounding area to minimize the flow of impacted groundwater to the unnamed tributary. The remedial alternative will be implemented to eliminate the possibility of direct contact to existing or future tenants. Currently, the surface water pathway is complete and requires further evaluation.

As mentioned in Section 4.3, VOC, SVOC, and inorganic exceedances of USEPA's Ecotox Threshold Benchmark values in Superfund ecological risk assessments (USEPA, 1996) were observed. The majority of the exceedances occurred at Jorgy's Pond (SD-3) and the two sample locations downstream of Jorgy's Pond with the C5 Plant Area (SD-4) and the Lower Plant Area (SD-5). Currently, the sediment pathway is complete and requires further evaluation.

6.2.5 Indoor Air

As discussed in Section 4.4, concentrations of VOCs and SVOCs reported for the indoor air samples collected during the site characterization do not exceed regulatory limits. Therefore, the indoor air pathway for the selected VOCs and SVOCs at the Jefferson Plant is incomplete and does not require further evaluation.

6.3 FATE AND TRANSPORT ANALYSIS

As discussed in Section 4.0, VOCs have been detected in groundwater samples from site monitoring wells above applicable MSCs. The fate and transport of COC in two site areas (Finished Products Warehouse and Lower Plant Areas) were evaluated. The COC have been detected in groundwater samples collected from monitoring wells located in suspected source areas and at downgradient well locations (i.e., future points of compliance [POC]) at concentrations that exceed applicable groundwater MSCs. A third area (the central portion of the Upper Plant Area) is known to have groundwater impacted by LNAPL; however, monitoring wells that were found to contain LNAPL were not sampled as part of the current groundwater monitoring program. A portion of the LNAPL in this area is believed to migrate into the UCIT where it is collected, transferred, and treated at the on-site water treatment plant.

A fate and transport analysis has been performed to evaluate the extent that COC may migrate under current site conditions. Recent groundwater sampling data from samples collected as part of the ongoing site characterization program was used in the fate and transport analysis. PADEP software programs, Quick Domenico (QD), SWLOAD (Version 5B) and PENTOXSD (Version 1.0a), were used to evaluate groundwater fate and transport and surface water impacts from diffuse flow of impacted groundwater at the site.

Due to a limited number of groundwater samples collected from Monitoring Wells E-29 (Finished Products Warehouse Area) and W-15 (Lower Plant Area), the plume character could not be evaluated as part of this evaluation. Therefore, it is noted that this fate and transport evaluation conservatively assumes that the contaminant plumes are at steady state.

As described in the TGM (PADEP, 2002), the QD model is used to calculate contaminant concentrations anywhere in a plume at any time after a continuous, finite source becomes active. QD was calibrated to a downgradient well by varying the attenuation lambda (i.e., first-order decay constant) until simulations reflected empirical field data. Next, the calibrated decay constant was used as input in the SWLOAD model. SWLOAD is a screening tool that uses a rearrangement of the QD equation to calculate concentrations at different points in the cross-section of a plume at any distance from a continuous finite source. Based on the plume concentrations, the mass loading of a particular contaminant from diffuse groundwater flow to a surface water body can be estimated. The results of the SWLOAD simulation compare the highest concentration in the plume with an "edge criterion" to determine whether or not a PENTOXSD analysis is required. Output parameters (average groundwater concentration and plume flow) from the SWLOAD model are used as input into the PENTOXSD model. PENTOXSD is used to determine if the groundwater discharge to a surface water body meets applicable surface water quality criteria. The PENTOXSD model uses a mass-balance water quality analysis model that includes considerations for mixing and first-order decay to determine recommended water quality-based effluent limits.

The model simulations were evaluated for COC using the January to February 2004 and March 2004 monitoring data. As previously discussed, calibration of the QD simulations was completed by varying the first-order decay constant until the plume concentration matched detected concentrations at actual downgradient sample locations. Calibration methods (as appropriate) are further discussed for each modeled area. The three areas of interest at the site are the Finished Products Warehouse, the Upper Plant, and Lower Plant Areas. Contaminant fate and transport was not attempted for the Upper Plant because of the limited groundwater analytical data due to the presence of LNAPL. Contaminant fate and transport was evaluated for the Finished Products Warehouse and Lower Plant Area using different procedures which are discussed in the following sections.

6.3.1 Finished Products Warehouse Area

Chlorinated solvents have been identified in groundwater samples from the Finished Products Warehouse Area. The specific location of the source area is believed to be in the vicinity of Monitoring Well E-29. COC evaluated during the analysis of the Finished Products Warehouse Area include:

- 1,1-DCA,
- 1,1-DCE,
- *cis*-1,2-DCE,
- Benzene,
- PCE,
- TCE, and
- Vinyl chloride.

Groundwater sample results (January 2004 sampling event) from Monitoring Wells E-29 (located in the suspected source area) and E-24 (downgradient location) were included in this evaluation. The COC related to the Finished Products Warehouse Area were identified as impacting the shallow unconsolidated aquifer. It is believed that groundwater in the shallow unconsolidated aquifer in this area provides recharge to, and mixes with, surface water in the Monongahela River. Monitoring Wells E-29 and E-24 are located approximately 325 and 80 feet upgradient from the Monongahela River, respectively. It is assumed that the Monongahela River will be considered the POC for groundwater discharging to surface water downgradient of the Finished Products Warehouse Area.

For the portion of the groundwater between the suspected source area and the river, QD was used to simulate groundwater fate and transport. Only TCE was detected above the used aquifer, TDS $\leq$ 2,500 mg/l, non-residential MSCs in the groundwater samples from Monitoring Well E-29. Sample results from Monitoring Well E-29 and E-24 collected during the January 2004 sampling event were used as input for the QD analysis. Site-specific hydrogeologic data from the current and past investigations were also used as input for the spreadsheet. The calibration of TCE was performed for the QD model using the analytical results from Monitoring Well E-24 (the furthest downgradient groundwater sample where TCE was detected). The output sheets for the QD model are provided in Appendix E. Also, Table E-1 in Appendix E presents a summary of the input parameters used for the QD model.

The calibrated first-order decay constant was then used in the SWLOAD simulations for the Finished Products Warehouse Area. The SWLOAD simulation indicates that diffuse flow from the shallow unconsolidated aquifer near the Finished Products Warehouse Area results in COC concentrations above regulatory limits at the surface water POC (the Monongahela River). Based on this result, further evaluation using a PENTOXSD analysis was required. The output sheets for the SWLOAD program are provided in Appendix E. Also, Table E-2 in Appendix E presents a summary of the input parameters used for the SWLOAD model.

The PENTOXSD model was used to evaluate attainment of various surface water regulatory limits at the surface water POC. As previously discussed, the Monongahela River is considered to be the surface water POC for this evaluation. The stream reach evaluated by the PENTOXSD model is defined as the portion of the Monongahela River immediately downstream from the site area. Input data used for the model are summarized below:

Parameter	Value	Source of Data
Basin	19	PA Gazetteer of Streams (PA Code Title 25, Chapter 93)
Stream Code	37185	Stream code for the Monongahela River (defined by PENTOXSD).
River Mile Index (RMI)	1 and 0.1	Distance (in miles) of stream nodes for the Monongahela River adjacent to the site downstream to the Elizabeth Bridge.
Elevation	727 and 719	Elevation (feet, MSL) at nodes from topographic map.
Drainage Area	5340 and 5350	Drainage area (in square miles [mi^2]) for the Monongahela River reported by the U.S. Geological Survey for gage stations at Lock/Dam No. 3 and at the Elizabeth Bridge.
$Q_{7\text{-}10}$ Flow Rate	494	Flow rate (in cubic feet per second [ft^3/sec]) for the Monongahela River reported by the U.S. Geological Survey for gage stations at Lock/Dam No. 3 and at the Elizabeth Bridge. Reporting period 1935-1995.
Harmonic Mean Flow Rate	2860	Flow rate (in cubic feet per second) for the Monongahela River reported by the U.S. Geological Survey for gage stations at Lock/Dam No. 3 and at the Elizabeth Bridge. Reporting period 1935-1995.
Permit Number	PA000E24	Direct input (not an actual permit number).
Existing Discharge Flow	0.0016	Plume flow (in millions of gallons per day) based on the results of the SWLOAD model.
Parameter	TCE	Primary COC.
Discharge Concentration	3.05	The average plume concentration (in µg/l) calculated and reported by the SWLOAD model.

In addition to TCE, six other VOCs were detected in the groundwater sample from Monitoring Well E-24 (but not in the sample from Well E-29) including: 1,1-DCA (1,400 µg/l), 1,1-DCE (67 µg/l), *cis*-1,2-DCE (3,600 µg/l), benzene (10 µg/l), PCE (20 µg/l), and vinyl chloride (370 µg/l). With the exception of *cis*-1,2- DCE, these parameters were also included in the PENTOXSD simulation. It is noted that *cis*-1,2-DCE is not a parameter that is available for analysis by PENTOXSD. The remaining input values used by the model were default values. It is noted that the default values assume immediate and complete mixing of groundwater into surface water.

To be conservative, the parameter concentrations reported in the sample from Monitoring Well E-24 were used as the discharge concentrations entering the river. It is likely that these parameter concentrations will attenuate (to some degree) prior to discharging into the river.

The output for the January 2004 model simulation indicates that the surface water concentration of TCE (calculated by SWLOAD) or the five additional VOCs evaluated by PENTOXSD will not theoretically exceed any of the four water quality-based criteria used by the model. The output sheets for the PENTOXSD simulation are presented in Appendix E. Also, a summary of input parameters for the model are provided in Table E-3 in Appendix E.

6.3.2 Lower Plant Area

The Lower Plant Area is monitored by several monitoring wells where VOCs and SVOCs have been detected in groundwater samples at concentrations above applicable Act 2 MSCs. Based on the results for sampling and analysis (highest concentration of VOCs and SVOCs), the specific location of the source area is believed to be in the vicinity of Monitoring Well W-15. COC evaluated during the analysis of the Lower Plant Area include the following:

- Benzene,
- Benzo(a)pyrene,
- Benzo(g,h,i)perylene,
- Dibenzo(a,h)anthracene,
- 1,4-Dioxane,
- Ethylbenzene,
- Naphthalene,
- 1,2,4-TMB, and
- 1,3,5-TMB.

Groundwater sample results (January to February 2004 and March 2004 sampling events) from Monitoring Wells W-15 (located in the suspected source area) and W-7 (downgradient location) were included in this evaluation. The COC related to the Lower Plant Area were identified as impacting the perched unconsolidated groundwater zone and shallow unconsolidated groundwater zone. It is believed that groundwater in the perched unconsolidated unit discharges to the shallow unconsolidated zone in this area providing recharge to, and mixes with, surface water in the Monongahela River. Monitoring Wells W-15 and W-7 are located approximately 175 and 15 feet upgradient from the Monongahela River, respectively. It is assumed that the Monongahela River will be considered the POC for groundwater discharging to surface water downgradient of the LP Area.

For the portion of the groundwater between the suspected source area and the river, QD was used to simulate groundwater fate and transport. Four COC were detected in both Monitoring Wells W-15 and W-7 including 1,2,4-TMB, 1,3,5-TMB, benzene, and ethylbenzene above applicable MSCs. Sample results from Monitoring Well W-15 (January to February 2004 sampling event) and Monitoring Well W-7 (March 2004 sampling event) were used as input for the QD analysis. Site-specific hydrogeologic data from the current and past investigations were also used as input for the spreadsheet. The calibration of the COC was performed for the QD model using the analytical results from Monitoring Well W-7. It is noted that the remaining compounds [benzo(a)pyrene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, 1,4-dioxane, and naphthalene] were either not detected above reporting limits or were reported as estimated values. Therefore, these compounds could not be calibrated in the model. The output sheets for the QD model are provided in Appendix E. Also, Table E-4 in Appendix E presents a summary of the input parameters used for the QD model.

The calibrated first-order decay constant was then used in the SWLOAD simulations for the Lower Plant Area. The SWLOAD simulation indicates that diffuse flow from the shallow groundwater unconsolidated groundwater zone near the Lower Plant Area results in COC concentrations above regulatory limits (for each of the three COC evaluated) at the surface water POC (the Monongahela River). Based on this result, further evaluation using a PENTOXSD analysis was required. The output sheets for the SWLOAD program are provided in Appendix E. Also, Table E-5 in Appendix E presents a summary of the input parameters used for the SWLOAD model. It is noted that, for unknown reasons, the calibrated first-order decay constant for 1,2,4-TMB (1.84×10^{-5} $days^{-1}$ determined from the QD model simulation) did not yield the correct highest modeled concentration in the SWLOAD simulation. Therefore, the first-order decay constant used in the SWLOAD simulation was adjusted (to 9.23×10^{-5} $days^{-1}$) until the highest modeled concentration matched the concentration of 1,2,4-TMB calculated by the QD model. This was done so that the average groundwater concentration of the plume entering the river would be accurate.

As previously discussed, the Monongahela River is considered to be the surface water POC for this evaluation. The stream reach evaluated by the PENTOXSD model is defined as the portion of the Monongahela River immediately downstream from the site area. Input data used for the model are summarized below:

Parameter	Value	Source of Data
Basin	19	PA Gazetteer of Streams (PA Code Title 25, Chapter 93).
Stream Code	37185	Stream code for the Monongahela River (defined by PENTOXSD).
RMI	1 and 0.1	Distance (in miles) of stream nodes for the Monongahela River adjacent to the site downstream to the Elizabeth Bridge.
Elevation	727 and 719	Elevation (feet, MSL) at nodes from topographic map.
Drainage Area	5340 and 5350	Drainage area (in mi^2) for the Monongahela River reported by the U.S. Geological Survey for gage stations at Lock/Dam No. 3 and at the Elizabeth Bridge.
$Q_{7\text{-}10}$ Flow Rate	494	Flow rate (in ft^3/sec) for the Monongahela River reported by the U.S. Geological Survey for gage stations at Lock/Dam No. 3 and at the Elizabeth Bridge. Reporting period 1935-1995.
Harmonic Mean Flow Rate	2860	Flow rate (in ft^3/sec) for the Monongahela River reported by the U.S. Geological Survey for gage stations at Lock/Dam No. 3 and at the Elizabeth Bridge. Reporting period 1935-1995.
Permit Number	PA000W15	Direct input (not an actual permit number).
Existing Discharge Flow	0.053	Plume flow (in millions of gallons per day) calculated using flow equations based on site-specific data.
Parameter	Benzene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene	Primary COC.
Discharge Concentrations	470 2,200 840 1 1 1	The reported contaminant concentrations (in µg/l) for the COC listed above.

In addition to the six COC listed above, three other VOCs or SVOCs were detected in the groundwater sample from Monitoring Well W-15 including: 1,2,4-TMB (2,000 µg/l), 1,3,5-TMB (900 µg/l), and 1,4-dioxane (26 µg/l). It is noted that 1,2,4-TMB, 1,3,5-TMB, and 1,4-dioxane are not parameters that are available for analysis by PENTOXSD. To be conservative, the parameter concentrations reported in the sample from Monitoring Well W-15 were used as the discharge concentrations entering the river. It is likely that these parameter concentrations will attenuate (to some degree) prior to discharging into the river. The remaining parameters were also included in the PENTOXSD simulation. The remaining input values used by the model were default values. It is noted that the default values assume immediate and complete mixing of groundwater into surface water.

The output for the January 2004 model simulation indicates that the surface water concentrations of COC in the Lower Plant Area will not theoretically exceed any of the four water quality-based criteria used by PENTOXSD. The output sheets for PENTOXSD simulation are presented in Appendix E. Also, a summary of input parameters for the model are provided in Table E-6 in Appendix E.

It is also noted that the LPIT is a groundwater remedial measure that is located between the suspected source area in the Lower Plant Area and the Monongahela River. The LPIT collects impacted groundwater from a large portion of the Lower Plant Area and transfers it to the on-site water treatment plant for treatment and disposal.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This RI Report has been prepared in accordance with Chapter 250 regulations and the *Final Draft of the Act 2 TGM*. This report evaluates potential exposure pathways used in the site conceptual model and historical investigation and characterization data. The RI Report findings are as follows:

- Surface and subsurface soil concentrations in samples collected during the Remedial Investigation were below applicable direct-contact MSCs. Therefore, a direct-contact exposure pathway evaluation was not performed for this medium.

- There were several surface and subsurface soil concentrations that exceeded the soil-to-groundwater pathway MSCs. Therefore, the soil-to-groundwater exposure pathway is complete and has been evaluated.

- Based on a comprehensive evaluation of groundwater samples collected from site monitoring wells, MSC exceedances of VOCs, SVOCs, and inorganics for the used aquifer standard exist.

- The groundwater exposure pathway related to potable use of site groundwater is incomplete. Currently, there is no on-site use of groundwater. Furthermore, deed restrictions will provide groundwater use restrictions at the Jefferson Plant.

- Two COC exceed Chapter 16 surface water criteria in the unnamed tributary to the Monongahela River making the pathway complete.

- There is a number of USEPA Ecotox threshold exceedances in sediments collected from the unnamed tributary to the Monongahela River at the Jefferson Plant. Also, the background sediment sampling location contains several threshold exceedances.

- Groundwater flow assessments conducted at the UCIT and the LPIT concluded that when in operation, the trenches mitigate groundwater discharge to surface water and capture LNAPL and impacted groundwater, as designed.

- A videotape inspection and surface water sampling conducted at the two storm sewers traversing from the 837 Tank Farm Area to Jorgy's Pond identified impacted groundwater infiltrating into the storm water collection system.

- Fate and transport analysis of diffuse groundwater flow from the Lower Plant and Finished Products Warehouse Areas to the Monongahela River indicates surface water concentrations of COC in both areas will not theoretically exceed any of the four water quality-based criteria used by PENTOXSD.

Institutional controls consisting of deed restrictions will be placed on the use of groundwater within the Jefferson Plant. Interim remedial measures are being evaluated for surface water associated with the Upper Plant Area in the vicinity of Jorgy's Pond. Subsequent attainment demonstrations under the site-specific standard will be made according to the remedial measure implemented.

Respectively submitted,
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"By affixing my seal to this report, I am certifying that this information is true and correct. I further certify that I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of this information."

Matt J. Valt — 8/16/04

Matthew J. Valentine, P.G. — Date

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TABLES

CUMMINGS
RITER

TABLE 1
SUMMARY OF DEEP UNCONSOLIDATED
GROUNDWATER ZONE SLUG TEST RESULTS
FEBRUARY 2004
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

	Hydraulic Conductivity			
Well ID	**Falling Head Test Results**		**Rising Head Test Results**	
Analytical Solution	**(ft/day)**	**(cm/sec)**	**(ft/day)**	**(cm/sec)**
E-59				
Bouwer & Rice	12.80	4.52E-03	16.10	5.68E-03
E-60				
Bouwer & Rice	11.90	4.20E-03	12.80	4.52E-03
E-61				
Bouwer & Rice	3.51	1.24E-03	4.26	1.50E-03
E-62				
Bouwer & Rice	0.20	7.06E-05	0.26	9.00E-05
E-63				
Bouwer & Rice	9.91	3.50E-03	13.90	4.90E-03
Average =	7.66	2.70E-03	9.46	3.34E-03
Overall Average =	8.56	ft/day		
	3.02E-03	cm/sec		

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CUMMINGS RITER

TABLE 2
WATER LEVEL ELEVATIONS
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Monitoring Well/Piezometer Identification	Top of Riser (TOR) Elevation	2/13/2004				2/26/2004			
		Depth to Water	Depth to LNAPL[c]	LNAPL Thickness	Water Level Elevation	Depth to Water	Depth to LNAPL	LNAPL Thickness	Water Level Elevation
	feet above MSL[a]	feet TOR[b]	feet TOR	feet	feet above MSL	feet TOR	feet TOR	feet	feet above MSL
E-1	763.78	7.41			756.37	7.43			756.35
E-2	760.68	11.55			749.13	11.11			749.57
E-3AD	753.39	4.99			748.40	5.37			748.02
E-4	761.50	11.28			750.22	12.98			748.52
E-5	759.30	12.29			747.01	12.40			746.90
E-6	758.76	12.48	12.45	0.03	746.28	13.66	13.64	0.02	745.10
E-7	758.18	NA[d]			NA	NA[d]			NA
E-8	748.46	13.84			734.62	15.81			732.65
E-9	748.28	11.39			736.89	12.73			735.55
E-12	750.86	17.25			733.61	19.00			731.86
E-13	753.10	19.50			733.60	21.53			731.57
E-14	753.25	17.20			736.05	19.80			733.45
E-15	753.65	14.24			739.41	15.96			737.69
E-16	752.51	5.46			747.05	5.64			746.87
E-17	753.63	17.92			735.71	19.91			733.72
E-18	752.80	9.09			743.71	9.61			743.19
E-21	742.40	2.89			739.51	1.90			740.50
E-23	754.20	22.87			731.33	25.00			729.20
E-24	751.97	15.24			736.73	16.90			735.07
E-25	757.14	17.25			739.89	18.95			738.19
E-26	755.06	10.32	10.32	Sheen	744.74	17.71	17.71	Sheen	737.35
E-27	757.06	12.70			744.36	12.94			744.12
E-28	742.39	16.99			725.40	20.45			721.94
E-29	753.03	15.68			737.35	17.24			735.79
E-30	742.86	5.70	5.17	0.53	737.16	NA[e]			NA
E-31	740.89	5.71			735.18	5.69			735.20
E-32	741.78	3.61			738.17	4.85			736.93
E-33	745.81	6.85			738.96	8.41			737.40
E-34	742.61	3.99			738.62	3.93			738.68
E-35	750.23	15.27			734.96	11.00			739.23
E-36	751.21	16.25	9.87	6.38	734.96	20.40	10.45	9.95	730.81
E-37	753.50	11.73			741.77	13.11			740.39
E-38	744.67	NA[f]			NA[f]	NA[f]			NA
E-40	751.68	14.72			736.96	16.50			735.18
E-41	752.01	NA[e]			NA	NA[f]			NA
E-42	755.98	18.36			737.62	19.91			736.07
E-43	756.04	17.46			738.58	19.28			736.76
E-44	757.47	14.63			742.84	16.26			741.21
E-45	752.38	10.76			741.62	8.15			744.23
E-46	752.42	18.47			733.95	20.51			731.91
E-47	752.35	18.18			734.17	20.19			732.16
E-48	752.14	15.38			736.76	16.85			735.29
E-49	751.29	14.89			736.40	16.13			735.16
E-51	757.78	9.95			747.83	11.87			745.91
E-52	757.73	13.30			744.43	14.48			743.25

CUMMINGS RITER

TABLE 2
WATER LEVEL ELEVATIONS
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Monitoring Well/Piezometer Identification	Top of Riser (TOR) Elevation	2/13/2004				2/26/2004			
		Depth to Water	Depth to LNAPL[c]	LNAPL Thickness	Water Level Elevation	Depth to Water	Depth to LNAPL	LNAPL Thickness	Water Level Elevation
	feet above MSL[a]	feet TOR[b]	feet TOR	feet	feet above MSL	feet TOR	feet TOR	feet	feet above MSL
E-53	754.42	10.54			743.88	11.94			742.48
E-54	754.71	15.82			738.89	17.80			736.91
E-55	755.96	10.15			745.81	10.71			745.25
E-56	754.89	10.12			744.77	10.08			744.81
E-57	756.23	9.36			746.87	9.54			746.69
E-58	755.68	17.90			737.78	19.40			736.28
E-59	740.84	6.11			734.73	8.24			732.60
E-60	746.27	11.30			734.97	13.34			732.93
E-61	747.92	14.07			733.85	15.58			732.34
E-62	758.36	17.91			740.45	18.79			739.57
E-63	757.44	21.60			735.84	23.60			733.84
MW-1	783.25	16.03			767.22	18.59			764.66
MW-2	757.77	6.38			751.39	5.46			752.31
MW-3	755.90	3.26			752.64	3.37			752.53
MW-4	754.50	4.38			750.12	4.78			749.72
MW-5	759.67	7.03			752.64	7.30			752.37
MW-F1	750.11	5.77			744.34	7.12			742.99
MW-F2	757.65	6.45			751.20	8.02			749.63
MW-F3	746.37	10.32			736.05	10.70			735.67
MW-F4	761.26	18.60	9.61	8.99	742.66	15.37	10.22	5.15	745.89
MW-F5	755.89	15.98	10.50	5.48	739.91	17.48	12.01	5.47	738.41
W-1A	743.00 [g]	4.60			738.40	5.31			737.69
W-2A	741.52	14.59			726.93	16.09			725.43
W-7	743.53	NA[h]			NA	13.10			730.43
W-10	743.49	3.26			740.23	3.55			739.94
W-15	744.36	4.39			739.97	4.45			739.91
W-18A	757.15	21.00	11.80	9.20	736.15	29.82	12.57	17.25	727.33
W-21A1	750.61	14.01			736.60	14.99			735.62
LP-2	753.83	8.45			745.38	9.98			743.85
LP-3	756.06	13.70			742.36	15.22			740.84
LP-5	751.56	11.43			740.13	13.20			738.36
LP-6	742.86	NA[e]			NA	13.49			729.37
LP-7	742.65	6.96			735.69	2.54			740.11
LP-8	741.57	4.95			736.62	5.30			736.27
LP-9	741.21	9.76			731.45	9.69			731.52
UP-4	755.37	9.95			745.42	10.03			745.34
UP-6	755.67	21.25	11.48	9.77	734.42	21.30	11.82	9.48	734.37
UP-7	755.98	NA[e]			NA	8.47			747.51
UP-8	756.59	10.52			746.07	11.70			744.89

TABLE 2
WATER LEVEL ELEVATIONS
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) "feet above MSL" is feet above mean sea level.
(b) "feet TOR" is feet from the top of riser.
(c) "LNAPL" is light non-aqueous phase liquid.
(d) Water level could not be measured due to the monitoring well being filled with ice.
(e) Water level could not be measured due to the piezometer being covered with Eastman equipment.
(f) Water level could not be measured due to damage to monitoring well.
(g) Monitoring well has not been surveyed and elevation provided is estimated from site map.
(h) Water level could not be measured due to the monitoring well being covered with ice.

TABLE 3
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Surface Soil (mg/kg)[b]	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F8A (1.5 - 2.5 ft)[d] 10/16/00	SB-F17A (1.5 - 2.5 ft) 10/19/00
Groundwater Depth (feet)[a]			30	15.5
Inorganics (mg/kg)				
Antimony	1,100	27	0.48 J[f]	0.38 J
Arsenic	53	150	8.6	6.9
Barium	190,000	8,200	189 J	31.9
Beryllium	5,600	320	1.5	0.3 B[g]
Cadmium	210	38	3.3	0.12 B
Chromium	420[e]	190[e]	19.4	4.6
Cobalt	56,000	200	13.4	5.7
Copper	100,000	36,000	19.5	10.8
Lead	1,000	450	18.8	6
Mercury	840	10	0.049 B	< 0.11 R
Nickel	56,000	650	18.1	7.6
Selenium	14,000	26	< 1.2[h]	< 0.56
Silver	14,000	84	0.13 B	< 0.56
Thallium	200	14	< 2.4	< 1.1
Tin	190,000	6,100	< 11.8	< 11.3
Vanadium	20,000	72,000	21.4	7.5
Zinc	190,000	12,000	69.3	36.2
Volatile Organics (mg/kg)				
Acetone	10,000	1,000	0.0022 J	< 0.0041
Benzene	210	0.5	< 0.0045	< 0.0072
1,1-Dichloroethane	1,000	11	< 0.0045	< 0.0072
cis-1,2-Dichloroethene	1,900	7	< 0.0022	< 0.0036
Ethylbenzene	10,000	70	< 0.0045	< 0.0072
Tetrachloroethene	1,500	0.50	< 0.0045	< 0.0072
Toluene	10,000	100	< 0.0045	< 0.0072
o-Xylene	10,000[i]	1,000[i]	< 0.0022	< 0.0036
m-Xylene & p-Xylene	10,000[i]	1,000[i]	< 0.0045	< 0.0072
Semivolatile Organics (mg/kg)				
Acenaphthene	170,000	4,700	< 0.39	< 0.37
Acenaphthylene	170,000	6,900	< 0.39	< 0.37
Anthracene	190,000	350	< 0.39	< 0.37
Benzo (a) anthracene	110	320	0.063 J	< 0.37
Benzo (a) pyrene	11	46	0.062 J	< 0.37
Benzo (b) fluoranthene	110	170	0.063 J	< 0.37
Benzo (k) fluoranthene	1,100	610	0.059 J	< 0.37
Benzo (ghi) perylene	170,000	180	< 0.39	< 0.37
bis(2-Ethylhexyl) phthalate	5,700	130	< 0.17	0.038 J
Butyl benzyl phthalate	10,000	10,000	< 0.39	< 0.37

CUMMINGS RITER

TABLE 3
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Surface Soil (mg/kg)[b]	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg)	SB-F8A	SB-F17A
		TDS <2,500 mg/L	(1.5 - 2.5 ft)[d] 10/16/00	(1.5 - 2.5 ft) 10/19/00
Groundwater Depth (feet)[a]			30	15.5
Semivolatile Organics (mg/kg) (Continued)				
Chrysene	11,000	230	0.074 J	< 0.37
Dibenz(a,h)anthracene	11	160	< 0.39	< 0.37
Dibenzofuran	100[j]	0.5[j]	< 0.39	< 0.37
Fluoranthene	110,000	3,200	0.13 J	< 0.37
Fluorene	110,000	3,800	< 0.39	< 0.37
Indeno(1,2,3-cd) pyrene	110	28,000	< 0.39	< 0.37
2-Methylnaphthalene	10,000	8,000	0.028 J	< 0.37
2-Methylphenol	10,000	510	< 0.39	< 0.37
Naphthalene	56,000	25	< 0.39	< 0.37
Phenanthrene	190,000	10,000	0.061 J	< 0.37
Phenol	190,000	400	< 0.39	< 0.37
Pyrene	84,000	2,200	0.072 J	< 0.37
Polychlorinated Biphenyls (ug/kg)[k]	[l]	[l]	*None Detected*	
Other (mg/kg)				
Hydrocarbons as GRO			< 0.12	< 0.11
Hydrocarbons as DRO			< 12 J	< 11
pH (standard units)			9	8.7
Total Organic Carbon			9,140	385
TPH			367	< 37.2

Notes:

(a) Groundwater depth based on ARCADIS depth to groundwater during drilling.
(b) PADEP medium specific concentration (MSC) direct-contact, non-residential surface soil (Pennsylvania Bulletin, Volume 31, No. 47, November 24, 2001); "mg/kg" is milligrams per kilogram or parts per million.
(c) PADEP medium specific concentration (MSC) used-aquifer, non-residential soil to groundwater (Pennsylvania Bulletin, Volume 31, No. 47, November 24, 2001).
(d) Depth below ground surface.
(e) MSC listed is for hexavalent chromium.
(f) "J" indicates estimated results for organic compounds.
(g) "B" indicates estimated results for inorganics.
(h) "<x" indicates the constituent was not detected above the sample specific detection limit.
(i) MSC is based on total xylenes.
(j) From Table 6, threshold of regulated compounds (Pennsylvania Bulletin, Volume 31, No. 47, November 24, 2001).
(k) "ug/kg" is micrograms per kilogram or parts per billion.
(l) Total PCB not listed; listed for individual aroclors.

CUMMINGS RITER

TABLE 4
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
OF DETECTED CONSTITUENTS
KU RESOURCES (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	Direct Contact Surface Soil PADEP MSC (mg/kg)(b)	Soil to Groundwater Pathway PADEP MSC(c) TDS<2500 mg/L (mg/kg)	B7 0.5-feet(d)
Groundwater Depth (feet)(a)			0.5
Inorganics (mg/kg)			
Arsenic	53	150	0.83
Barium	190,000	8,200	119
Cadmium	210	38	<1
Chromium	420(e)	190(e)	10.4
Lead	1,000	450	14.2
Selenium	14,000	26	0.28
Copper	100,000	36,000	19.9
Nickel	56,000	650	8.4
Zinc	190,000	12,000	31.9
Aluminum	190,000	NL	3,700
Calcium	NL(f)	NL	80,600
Cobalt	56,000	200	4
Iron	190,000	NL	7,150
Potassium	NL	NL	366
Magnesium	NL	NL	1,650
Manganese	190,000	NL	586
Sodium	NL	NL	212
Vanadium	20,000	72,000	9
Cyanide	56,000(g)	200(g)	<0.05
Volatile Organic Compounds (mg/kg)			
Benzene	210	0.5	<0.20
n-Butylbenzene	10,000	2,600	<0.20
sec-Butylbenzene	10,000	960	18.7
Carbon Disulfide	10,000	410	<0.20
Ethylbenzene	10,000	70	**696(j)**
Isopropylbenzene	NL	NL	43.5
p-Isopropyltoluene	NL	NL	17.7
Naphthalene	56,000	25	134
n-Propylbenzene	10,000	780	102
Toluene	10,000	100	11.6
1,2,4-Trichlorobenzene	10,000	27	<0.20
1,2,4-Trimethylbenzene	320	20	**145**
1,3,5-Trimethylbenzene	320	6.2	**70.5**
Xylenes, Total	10,000	1,000	465
M,p-Xylenes	NL	NL	326
o-Xylene	NL	NL	139
Semivolatile Organic Compounds (mg/kg)			
Acenaphthylene	170,000	6,900	0.72
Anthracene	190,000	350	0.33
Benzo(a)anthracene	110	320	<0.01
Benzo(a)pyrene	11	46	<0.01
Benzo(b)fluoranthene	110	170	<0.01
Benzo(k)fluoranthene	1,100	610	<0.01
bis (2-Ethylhexyl) phthalate	5,700	130	6.11
Butylbenzyl phthalate	10,000	10,000	0.14
4-Chloroaniline	11,000	52	1
Chrysene	11,000	230	<0.01
Dibenzofuran	100(h)	0.5(h)	<0.01
Di-n-butyl phthalate	10,000	4,100	0.12
2,6-Dinitrotoluene	2,800	10	0.06
Fluoranthene	110,000	3,200	0.41
Phenanthrene	190,000	10,000	0.69
Pyrene	84,000	2,200	0.17
2-Methylnapthalene	10,000	8,000	<0.01
PCBs (ug/kg)	(i)	(i)	*None Detected*

Notes:
(a) Groundwater depth based on depth to groundwater during drilling.
(b) PADEP medium specific concentration (MSC), direct-contact, non-residential surface soil (0-2 Feet) (Pennsylvania Bulletin, Volume 3, No. 47, November 24, 2001; "mg/kg" is milligrams per kilogram or parts per million.
(c) PADEP medium specific concentration (MSC), used-aquifer, non-residential soil to groundwater.
(d) Depth collected below ground surface.
(e) Value for total and hexavalent chromium.
(f) NL - an MSC does not exist for this constituent.
(g) Free cyanide MSC.
(h) From Table 6, threshold of regulatiod compounds (Pennsylvania Bulletin, Volume 3, No. 47, November 24, 2001).
(i) Total PCBs not listed; listed for individual Aroclors.
(j) Values shaded and in bold indicate an exceedance of the soil-to-groundwater MSC.
There are no direct-contact MSC exceedances.

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-1 (0-2) 12/3/2003	C-2 (0-2) 12/3/2003	C-3 (0-2) 12/3/2003	C-4 (0-2) 12/2/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	3,100,000	<[d] 5.6	< 5.2	< 5	< 5,200
1,1,1-Trichloroethane	20,000	10,000,000	< 5.6	< 5.2	< 5	< 5,200
1,1,2,2-Tetrachloroethane	30	28,000	< 5.6	< 5.2	< 5	< 5,200
1,1,2-Trichloroethane	500	100,000	< 5.6	< 5.2	< 5	< 5,200
1,1-Dichloroethane	11,000	1,000,000	< 5.6	< 5.2	< 5	< 5,200
1,1-Dichloroethene	700	33,000	< 5.6	< 5.2	< 5	< 5,200
1,2,3-Trichloropropane	400,000	820	< 5.6	< 5.2	< 5	< 5,200
1,2,4-Trimethylbenzene	20,000	320,000	< 5.6	< 5.2	< 5	< 5,200
1,2-Dibromo-3-chloropropane	20	11,000	< 11	< 10	< 10	< 10,000
1,2-Dibromoethane (EDB)	5	930	< 5.6	< 5.2	< 5	< 5,200
1,2-Dichloroethane	500	63,000	< 5.6	< 5.2	< 5	< 5,200
1,2-Dichloropropane	500	160,000	< 5.6	< 5.2	< 5	< 5,200
1,3,5-Trimethylbenzene	6,200	320,000	< 5.6	< 5.2	< 5	< 5,200
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	11J[e]	< 26	< 25	< 26,000
2-Hexanone	--[c]	--	< 28	< 26	< 25	< 26,000
3-Chloropropene (Allylchloride)	4,100	370,000	< 5.6	< 5.2	< 5	< 5,200
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	< 28	< 26	< 25	< 26,000
Acetone	1,000,000	10,000,000	120	29J	65	< 52,000
Acetonitrile	35,000	3,200,000	< 220	< 210	< 200	< 210,000
Acrolein (Propenal)	12	1,100	< 110	< 100	< 100	< 100,000
Acrylonitrile	270	24,000	< 110	< 100	< 100	< 100,000
Benzene	500	210,000	< 5.6	< 5.2	< 5	< 5,200
Bromodichloromethane	10,000	45,000	< 5.6	< 5.2	< 5	< 5,200
Bromoform	10,000	1,500,000	< 5.6	< 5.2	< 5	< 5,200
Bromomethane (Methyl Bromide)	1,000	270,000	< 5.6	< 5.2	< 5	< 5,200
Carbon disulfide	410,000	10,000,000	< 5.6	< 5.2	4.2J	< 5,200
Carbon tetrachloride	500	110,000	< 5.6	< 5.2	< 5	< 5,200
Chlorobenzene	10,000	10,000,000	< 5.6	< 5.2	< 5	< 5,200
Chloroethane	90,000	10,000,000	< 5.6	< 5.2	< 5	< 5,200
Chloroform	10,000	17,000	< 5.6	< 5.2	< 5	< 5,200
Chloromethane (Methyl Chloride)	300	920,000	< 5.6	< 5.2	< 5	< 5,200
Chloroprene	4,100	370,000	< 5.6	< 5.2	< 5	< 5,200
cis-1,2-Dichloroethene	7,000	1,900,000	< 5.6	< 5.2	< 5	< 5,200
cis-1,3-Dichloropropene	2,600	410,000	< 5.6	< 5.2	< 5	< 5,200
Dibromochloromethane	--	--	< 5.6	< 5.2	< 5	< 5,200
Dibromomethane (Methylene bromide)	20,000	1,900,000	< 5.6	< 5.2	< 5	< 5,200
Dichlorodifluoromethane	100,000	10,000,000	< 5.6	< 5.2	< 5	< 5,200
Ethyl methacrylate	180,000	190,000,000	< 5.6	< 5.2	< 5	< 5,200
Ethylbenzene	70,000	10,000,000	< 5.6	< 5.2	< 5	210J
Iodomethane (Methyl iodide)	--	--	< 5.6	< 5.2	< 5	< 5,200
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 220	< 210	< 200	< 210,000
Methacrylonitrile	410	37,000	< 110	< 100	< 100	< 100,000
Methyl methacrylate	410,000	10,000,000	< 5.6	< 5.2	< 5	< 5,200
Methylene chloride (Dichloromethane)	500	920,000	< 5.6	< 5.2	< 5	< 5,200
Pentachloroethane	--	--	< 28	< 26	< 25	< 26,000
Propionitrile	--	--	< 110	< 100	< 100	< 100,000
Styrene	24,000	10,000,000	< 5.6	< 5.2	< 5	190J
Tetrachloroethene	500	1,500,000	< 5.6	< 5.2	< 5	< 5,200
Toluene	100,000	10,000,000	< 5.6	< 5.2	6.8	150,000[f]
trans-1,2-Dichloroethene	10,000	3,700,000	< 5.6	< 5.2	< 5	< 5,200
trans-1,3-Dichloropropene	2,600	410,000	< 5.6	< 5.2	< 5	< 5,200
trans-1,4-Dichloro-2-butene	7	190,000,000	< 11	< 10	< 10	< 10,000
Trichloroethene	500	970,000	< 5.6	< 5.2	< 5	< 5,200
Trichlorofluoromethane	--	--	< 5.6	< 5.2	< 5	< 5,200
Vinyl acetate	120,000	10,000,000	< 11	< 10	< 10	< 10,000
Vinyl chloride	200	53,000	< 5.6	< 5.2	< 5	< 5,200
Xylenes, Total	1,000,000	10,000,000	< 11	< 10	< 10	< 10,000

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-1 (0-2) 12/3/2003	C-2 (0-2) 12/3/2003	C-3 (0-2) 12/3/2003	C-4 (0-2) 12/2/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	840,000	< 420	< 410	< 410	< 410
1,2,4-Trichlorobenzene	27,000	10,000,000	< 420	< 410	< 410	< 410
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 420	< 410	< 410	< 410
1,3,5-Trinitrobenzene	--	--	< 420	< 410	< 410	< 410
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 420	< 410	< 410	< 410
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	< 420	< 410	< 410	< 410
1,4-Dioxane	2,400	210,000	< 420	< 410	< 410	< 410
1,4-Naphthoquinone	--	--	< 420	< 410	< 410	< 410
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,200	< 2,100	< 2,100	< 2,100
1-Naphthylamine	1,100	44,000	< 420	< 410	< 410	< 410
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	< 420	< 410	< 410	< 410
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	< 420	< 410	< 410	< 410
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 420	< 410	< 410	< 410
2,4,6-Trichlorophenol	8,900	840,000	< 420	< 410	< 410	< 410
2,4-Dichlorophenol	2,000	8,400,000	< 420	< 410	< 410	< 410
2,4-Dimethylphenol	200,000	10,000,000	< 420	< 410	< 410	< 410
2,4-Dinitrophenol	4,100	5,600,000	< 2,200	< 2,100	< 2,100	< 2,100
2,4-Dinitrotoluene	840	260,000	< 420	< 410	< 410	< 410
2,6-Dichlorophenol	--	--	< 420	< 410	< 410	< 410
2,6-Dinitrotoluene	10,000	2,800,000	< 420	< 410	< 410	< 410
2-Acetylaminofluorene	280	21,000	< 420	< 410	< 410	< 410
2-Chloronaphthalene	18,000,000	190,000,000	< 420	< 410	< 410	< 410
2-Chlorophenol	4,400	920,000	< 420	< 410	< 410	< 410
2-Methylnaphthalene	8,000,000	10,000,000	< 420	< 410	< 410	< 410
2-Naphthylamine	140	44,000	< 420	< 410	< 410	< 410
2-Nitroaniline (o-Nitroaniline)	580	160,000	< 2,200	< 2,100	< 2,100	< 2,100
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	< 420	< 410	< 410	< 410
2-Picoline	--	--	< 420	< 410	< 410	< 410
3,3'-Dichlorobenzidine	32,000	180,000	< 850	< 820	< 820	< 820
3,3'-Dimethylbenzidine	1,500	8,600	< 2,200	< 2,100	< 2,100	< 2,100
3-Methylcholanthrene	--	--	< 420	< 410	< 410	< 410
3-Nitroaniline (m-Nitroaniline)	580	160,000	< 2,200	< 2,100	< 2,100	< 2,100
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,200	< 2,100	< 2,100	< 2,100
4-Aminobiphenyl	12	3,800	< 420	< 410	< 410	< 410
4-Bromophenylphenyl ether	--	--	< 420	< 410	< 410	< 410
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	< 420	< 410	< 410	< 410
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	< 850	< 820	< 820	< 820
4-Chlorophenylphenyl ether	--	--	< 420	< 410	< 410	< 410
4-Nitroaniline (p-Nitroaniline)	580	160,000	< 2,200	< 2,100	< 2,100	< 2,100
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	< 2,200	< 2,100	< 2,100	< 2,100
4-Nitroquinoline-1-oxide	--	--	< 4,200	< 4,100	< 4,100	< 4,100
5-Nitro-o-toluidine	--	--	< 420	< 410	< 410	< 410
7,12-Dimethylbenz(a)anthracene	--	--	< 420	< 410	< 410	< 410
Acenaphthene	4,700,000	170,000,000	< 420	< 410	< 410	< 410
Acenaphthylene	6,900,000	170,000,000	< 420	< 410	< 410	< 410
Acetophenone	1,000,000	10,000,000	< 420	< 410	< 410	< 410
alpha,alpha-Dimethylphenethylamine	--	--	< 86,000	< 84,000	< 84,000	< 84,000
Aniline	580	53,000	< 420	< 410	< 410	< 410
Anthracene	350,000	190,000,000	< 420	< 410	< 410	< 410
Aramite, Total	--	--	< 420	< 410	< 410	< 410
Benzo(a)anthracene	320,000	110,000	46J	150J	< 410	< 410
Benzo(a)pyrene	46,000	11,000	< 420	160J	< 410	< 410
Benzo(b)fluoranthene	170,000	110,000	< 420	< 410	< 410	< 410
Benzo(g,h,i)perylene	180,000	170,000,000	51J	90J	< 410	< 410
Benzo(k)fluoranthene	610,000	1,100,000	52J	< 410	< 410	< 410
Benzyl alcohol	3,100,000	10,000,000	< 420	< 410	< 410	< 410
bis(2-Chloroethoxy)methane	--	--	< 420	< 410	< 410	< 410

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs(b) Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-1 (0-2) 12/3/2003	C-2 (0-2) 12/3/2003	C-3 (0-2) 12/3/2003	C-4 (0-2) 12/2/2003
Semivolatile Organic Compounds cont'd. (ug/kg)						
bis(2-Chloroethyl)ether	55	5,000	< 420	< 410	< 410	< 410
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	120J	< 410	58J	< 410
Butylbenzylphthalate	10,000,000	10,000,000	< 420	< 410	< 410	< 410
Chrysene	230,000	11,000,000	45J	160J	< 410	< 410
Cresol (ortho)	510,000	10,000,000	< 420	< 410	< 410	< 410
Cresol, m & p	51,000	14,000,000	< 420	< 410	< 410	< 410
Diallate, Total	1,000	93,000	< 420	< 410	< 410	< 410
Dibenzo(a,h)anthracene	160,000	11,000	< 420	< 410	< 410	< 410
Dibenzofuran	--	--	< 420	< 410	< 410	< 410
Diethylphthalate	500,000	10,000,000	< 420	< 410	< 410	< 410
Dimethoate	2,000	560,000	< 420	< 410	< 410	< 410
Dimethylphthalate	--	--	< 420	< 410	< 410	< 410
Di-n-butylphthalate	4,100,000	10,000,000	< 420	< 410	< 410	< 410
Di-n-octylphthalate	10,000,000	10,000,000	< 420	< 410	< 410	< 410
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	< 420	< 410	< 410	< 410
Disulfoton	78	7,600	< 420	< 410	< 410	< 410
Ethyl methanesulfonate	--	--	< 420	< 410	< 410	< 410
Ethyl parathion (Parathion)	360,000	10,000,000	< 420	< 410	< 410	< 410
Famphur	--	--	< 420	< 410	< 410	< 410
Fluoranthene	3,200,000	110,000,000	44J	220J	< 410	< 410
Fluorene	3,800,000	110,000,000	< 420	< 410	< 410	< 410
Hexachlorobenzene	960	50,000	< 420	< 410	< 410	< 410
Hexachlorobutadiene	1,200	560,000	< 420	< 410	< 410	< 410
Hexachlorocyclopentadiene	91,000	10,000,000	< 420	< 410	< 410	< 410
Hexachloroethane	560	2,800,000	< 420	< 410	< 410	< 410
Hexachlorophene	--	--	< 220,000	< 210,000	< 210,000	< 210,000
Hexachloropropene	--	--	< 420	< 410	< 410	< 410
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	36J	63J	< 410	< 410
Isophorone	10,000	10,000,000	< 420	< 410	< 410	< 410
Isosafrole	--	--	< 420	< 410	< 410	< 410
m-Dinitrobenzene	100	280,000	< 420	< 410	< 410	< 410
Methapyrilene	--	--	< 86,000	< 84,000	< 84,000	< 84,000
Methyl methanesulfonate	2,600	800,000	< 420	< 410	< 410	< 410
Methyl parathion	420	48,000	< 420	< 410	< 410	< 410
Naphthalene	25,000	56,000,000	< 420	< 410	< 410	< 410
Nitrobenzene	5,100	1,400,000	< 420	< 410	< 410	< 410
N-Nitrosodiethylamine	1.3	38	< 420	< 410	< 410	< 410
N-Nitrosodimethylamine	1.3	120	< 420	< 410	< 410	< 410
N-Nitrosodi-n-butylamine	14	15,000	< 420	< 410	< 410	< 410
n-Nitrosodi-n-propylamine	37	11,000	< 420	< 410	< 410	< 410
N-Nitrosodiphenylamine	83,000	16,000,000	< 420	< 410	< 410	< 410
N-Nitrosomethylethylamine	--	--	< 420	< 410	< 410	< 410
N-Nitrosomorpholine	--	--	< 420	< 410	< 410	< 410
N-Nitrosopiperidine	--	--	< 420	< 410	< 410	< 410
N-Nitrosopyrrolidine	--	--	< 420	< 410	< 410	< 410
O,O,O-Triethyl phosphorothioate	--	--	< 420	< 410	< 410	< 410
o-Toluidine	1,200	330,000	< 420	< 410	< 410	< 410
p-(Dimethylamino)azobenzene	150	17,000	< 420	< 410	< 410	< 410
Pentachlorobenzene	660,000	2,200,000	< 420	< 410	< 410	< 410
Pentachloronitrobenzene	20,000	310,000	< 420	< 410	< 410	< 410
Pentachlorophenol	5,000	660,000	< 2,200	< 2,100	< 2,100	< 2,100
Phenacetin	120,000	36,000,000	< 420	< 410	< 410	< 410
Phenanthrene	10,000,000	190,000,000	< 420	73J	< 410	< 410
Phenol	400,000	190,000,000	< 420	< 410	< 410	< 410
Phorate	880	37,000	< 420	< 410	< 410	< 410
Pronamide	5,000	190,000,000	< 420	< 410	< 410	< 410
Pyrene	2,200,000	84,000,000	42J	200J	< 410	< 410
Pyridine	2,000	190,000	< 420	< 410	< 410	< 410
Safrole	--	--	< 420	< 410	< 410	< 410
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	< 420	< 410	< 410	< 410
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 420	< 410	< 410	< 410

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-1 (0-2) 12/3/2003	C-2 (0-2) 12/3/2003	C-3 (0-2) 12/3/2003	C-4 (0-2) 12/2/2003
Inorganics (mg/kg) [a]						
Antimony	27	1,100	< 2.5	< 2.4	< 2.3	< 2.4
Arsenic	150	53	6.7	7.5	9.9	8.2
Barium	8,200	190,000	150	130	110K	130
Beryllium	320	5,600	0.96	0.98	0.86	0.89
Cadmium	38	210	0.2J	0.36J	< 0.57	< 0.61
Chromium	190,000	190,000	17	18	23	24
Cobalt	200	56,000	14	17	7.1	8.1
Copper	36,000	100,000	19K[g]	21K	21K	19K
Lead	450	1,000	18K	17K	11K	11K
Mercury	10	840	0.043	0.04	0.035	0.025
Nickel	650	56,000	22	20	19	21
Selenium	26	14,000	< 1.2	< 1.2	< 1.1	< 1.2
Silver	84	14,000	< 1.2L[h]	< 1.2L	< 1.1L	< 1.2L
Thallium	14	200	< 1.2	< 1.2	< 1.1	< 1.2
Tin	6,100	190,000	2.5B[i]	2.2B	2.4B	2.1B
Vanadium	72,000	20,000	23	24	32	28
Zinc	12,000	190,000	66K	72K	62K	61K

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-5 (0-2) 11/24/2003	C-6 (0-2) 12/2/2003	C-7 (0-2) 11/24/2003	LP-1 (0-2) 12/4/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	3,100,000	< 5.2	< 5	< 5.4	< 5.4
1,1,1-Trichloroethane	20,000	10,000,000	< 5.2	< 5	< 5.4	< 5.4
1,1,2,2-Tetrachloroethane	30	28,000	< 5.2	< 5	< 5.4	< 5.4
1,1,2-Trichloroethane	500	100,000	< 5.2	< 5	< 5.4	< 5.4
1,1-Dichloroethane	11,000	1,000,000	< 5.2	< 5	< 5.4	< 5.4
1,1-Dichloroethene	700	33,000	< 5.2	< 5	< 5.4	< 5.4
1,2,3-Trichloropropane	400,000	820	< 5.2	< 5	< 5.4	< 5.4
1,2,4-Trimethylbenzene	20,000	320,000	< 5.2	< 5	< 5.4	< 5.4
1,2-Dibromo-3-chloropropane	20	11,000	< 10	< 10	< 11	< 11
1,2-Dibromoethane (EDB)	5	930	< 5.2	< 5	< 5.4	< 5.4
1,2-Dichloroethane	500	63,000	< 5.2	< 5	< 5.4	< 5.4
1,2-Dichloropropane	500	160,000	< 5.2	< 5	< 5.4	< 5.4
1,3,5-Trimethylbenzene	6,200	320,000	< 5.2	< 5	< 5.4	< 5.4
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 26	< 25	< 27	< 27
2-Hexanone	--[c]	--	< 26	< 25	< 27	< 27
3-Chloropropene (Allylchloride)	4,100	370,000	< 5.2	< 5	< 5.4	< 5.4
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	< 26	< 25	< 27	< 27
Acetone	1,000,000	10,000,000	< 52	< 50	< 54	< 54
Acetonitrile	35,000	3,200,000	< 210	< 200	< 220	< 220
Acrolein (Propenal)	12	1,100	< 100	< 100	< 110	< 110
Acrylonitrile	270	24,000	< 100	< 100	< 110	< 110
Benzene	500	210,000	4.5J	< 5	2.1J	< 5.4
Bromodichloromethane	10,000	45,000	< 5.2	< 5	< 5.4	< 5.4
Bromoform	10,000	1,500,000	< 5.2	< 5	< 5.4	< 5.4
Bromomethane (Methyl Bromide)	1,000	270,000	< 5.2	< 5	< 5.4	< 5.4
Carbon disulfide	410,000	10,000,000	< 5.2	< 5	< 5.4	< 5.4
Carbon tetrachloride	500	110,000	< 5.2	< 5	< 5.4	< 5.4
Chlorobenzene	10,000	10,000,000	6.9	< 5	5J	2J
Chloroethane	90,000	10,000,000	< 5.2	< 5	< 5.4	< 5.4
Chloroform	10,000	17,000	< 5.2	< 5	< 5.4	< 5.4
Chloromethane (Methyl Chloride)	300	920,000	< 5.2	< 5	< 5.4	< 5.4
Chloroprene	4,100	370,000	< 5.2	< 5	< 5.4	< 5.4
cis-1,2-Dichloroethene	7,000	1,900,000	< 5.2	< 5	< 5.4	< 5.4
cis-1,3-Dichloropropene	2,600	410,000	< 5.2	< 5	< 5.4	< 5.4
Dibromochloromethane	--	--	< 5.2	< 5	< 5.4	< 5.4
Dibromomethane (Methylene bromide)	20,000	1,900,000	< 5.2	< 5	< 5.4	< 5.4
Dichlorodifluoromethane	100,000	10,000,000	< 5.2	< 5	< 5.4	< 5.4
Ethyl methacrylate	180,000	190,000,000	< 5.2	< 5	< 5.4	< 5.4
Ethylbenzene	70,000	10,000,000	1.6J	< 5	1.4J	< 5.4
Iodomethane (Methyl iodide)	--	--	< 5.2	< 5	< 5.4	< 5.4
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 210	< 200	< 220	< 220
Methacrylonitrile	410	37,000	< 100	< 100	< 110	< 110
Methyl methacrylate	410,000	10,000,000	< 5.2	< 5	< 5.4	< 5.4
Methylene chloride (Dichloromethane)	500	920,000	< 5.2	< 5	< 5.4	< 5.4
Pentachloroethane	--	--	< 26	< 25	< 27	< 27
Propionitrile	--	--	< 100	< 100	< 110	< 110
Styrene	24,000	10,000,000	< 5.2	< 5	< 5.4	< 5.4
Tetrachloroethene	500	1,500,000	18	< 5	14	2.3J
Toluene	100,000	10,000,000	2.5J	< 5	< 5.4	< 5.4
trans-1,2-Dichloroethene	10,000	3,700,000	< 5.2	< 5	< 5.4	< 5.4
trans-1,3-Dichloropropene	2,600	410,000	< 5.2	< 5	< 5.4	< 5.4
trans-1,4-Dichloro-2-butene	7	190,000,000	< 10	< 10	< 11	< 11
Trichloroethene	500	970,000	14	< 5	5.7	6.7
Trichlorofluoromethane	--	--	< 5.2	< 5	< 5.4	< 5.4
Vinyl acetate	120,000	10,000,000	< 10	< 10	< 11	< 11
Vinyl chloride	200	53,000	< 5.2	< 5	< 5.4	< 5.4
Xylenes, Total	1,000,000	10,000,000	5.8J	< 10	6.3J	< 11

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs(b) Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-5 (0-2) 11/24/2003	C-6 (0-2) 12/2/2003	C-7 (0-2) 11/24/2003	LP-1 (0-2) 12/4/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	840,000	< 400	< 380	< 390	< 440
1,2,4-Trichlorobenzene	27,000	10,000,000	< 400	< 380	< 390	< 440
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 400	< 380	< 390	< 440
1,3,5-Trinitrobenzene	--	--	< 400	< 380	< 390	< 440
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 400	< 380	< 390	< 440
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	< 400	< 380	< 390	< 440
1,4-Dioxane	2,400	210,000	< 400	< 380	< 390	< 440
1,4-Naphthoquinone	--	--	< 400	< 380	< 390	< 440
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,000	< 2,000	< 2,000	< 2,300
1-Naphthylamine	1,100	44,000	< 400	< 380	< 390	< 440
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	< 400	< 380	< 390	< 440
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	< 400	< 380	< 390	< 440
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 400	< 380	< 390	< 440
2,4,6-Trichlorophenol	8,900	840,000	< 400	< 380	< 390	< 440
2,4-Dichlorophenol	2,000	8,400,000	< 400	< 380	< 390	< 440
2,4-Dimethylphenol	200,000	10,000,000	< 400	< 380	< 390	< 440
2,4-Dinitrophenol	4,100	5,600,000	< 2,000	< 2,000	< 2,000	< 2,300
2,4-Dinitrotoluene	840	260,000	< 400	< 380	< 390	< 440
2,6-Dichlorophenol	--	--	< 400	< 380	< 390	< 440
2,6-Dinitrotoluene	10,000	2,800,000	< 400	< 380	< 390	< 440
2-Acetylaminofluorene	280	21,000	< 400	< 380	< 390	< 440
2-Chloronaphthalene	18,000,000	190,000,000	< 400	< 380	< 390	< 440
2-Chlorophenol	4,400	920,000	< 400	< 380	< 390	< 440
2-Methylnaphthalene	8,000,000	10,000,000	< 400	< 380	< 390	< 440
2-Naphthylamine	140	44,000	< 400	< 380	< 390	< 440
2-Nitroaniline (o-Nitroaniline)	580	160,000	< 2,000	< 2,000	< 2,000	< 2,300
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	< 400	< 380	< 390	< 440
2-Picoline	--	--	< 400	< 380	< 390	< 440
3,3'-Dichlorobenzidine	32,000	180,000	< 800	< 770	< 780	< 880
3,3'-Dimethylbenzidine	1,500	8,600	< 2,000	< 2,000	< 2,000	< 2,300
3-Methylcholanthrene	--	--	< 400	< 380	< 390	< 440
3-Nitroaniline (m-Nitroaniline)	580	160,000	< 2,000	< 2,000	< 2,000	< 2,300
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,000	< 2,000	< 2,000	< 2,300
4-Aminobiphenyl	12	3,800	< 400	< 380	< 390	< 440
4-Bromophenylphenyl ether	--	--	< 400	< 380	< 390	< 440
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	< 400	< 380	< 390	< 440
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	< 800	< 770	< 780	< 880
4-Chlorophenylphenyl ether	--	--	< 400	< 380	< 390	< 440
4-Nitroaniline (p-Nitroaniline)	580	160,000	< 2,000	< 2,000	< 2,000	< 2,300
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	< 2,000	< 2,000	< 2,000	< 2,300
4-Nitroquinoline-1-oxide	--	--	< 4,000	< 3,800	< 3,900	< 4,400
5-Nitro-o-toluidine	--	--	< 400	< 380	< 390	< 440
7,12-Dimethylbenz(a)anthracene	--	--	< 400	< 380	< 390	< 440
Acenaphthene	4,700,000	170,000,000	< 400	< 380	< 390	< 440
Acenaphthylene	6,900,000	170,000,000	< 400	< 380	< 390	< 440
Acetophenone	1,000,000	10,000,000	< 400	< 380	< 390	< 440
alpha,alpha-Dimethylphenethylamine	--	--	< 81,000	< 78,000	< 79,000	< 89,000
Aniline	580	53,000	< 400	< 380	< 390	< 440
Anthracene	350,000	190,000,000	120J	< 380	< 390	< 440
Aramite, Total	--	--	< 400	< 380	< 390	< 440
Benzo(a)anthracene	320,000	110,000	650	59J	74J	< 440
Benzo(a)pyrene	46,000	11,000	580	< 380	66J	< 440
Benzo(b)fluoranthene	170,000	110,000	540	< 380	57J	< 440
Benzo(g,h,i)perylene	180,000	170,000,000	320J	35J	42J	< 440
Benzo(k)fluoranthene	610,000	1,100,000	570	< 380	67J	39J
Benzyl alcohol	3,100,000	10,000,000	< 400	< 380	< 390	< 440
bis(2-Chloroethoxy)methane	--	--	< 400	< 380	< 390	< 440

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[(b)] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-5 (0-2) 11/24/2003	C-6 (0-2) 12/2/2003	C-7 (0-2) 11/24/2003	LP-1 (0-2) 12/4/2003
Semivolatile Organic Compounds cont'd. (ug/kg)						
bis(2-Chloroethyl)ether	55	5,000	< 400	< 380	< 390	< 440
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	< 400	< 380	< 390	< 440
Butylbenzylphthalate	10,000,000	10,000,000	< 400	< 380	< 390	< 440
Chrysene	230,000	11,000,000	590	56J	71J	42B
Cresol (ortho)	510,000	10,000,000	< 400	< 380	< 390	< 440
Cresol, m & p	51,000	14,000,000	< 400	< 380	< 390	< 440
Diallate, Total	1,000	93,000	< 400	< 380	< 390	< 440
Dibenzo(a,h)anthracene	160,000	11,000	180J	< 380	< 390	< 440
Dibenzofuran	--	--	47J	< 380	< 390	< 440
Diethylphthalate	500,000	10,000,000	< 400	< 380	< 390	< 440
Dimethoate	2,000	560,000	< 400	< 380	< 390	< 440
Dimethylphthalate	--	--	< 400	< 380	< 390	< 440
Di-n-butylphthalate	4,100,000	10,000,000	< 400	< 380	< 390	< 440
Di-n-octylphthalate	10,000,000	10,000,000	< 400	< 380	< 390	< 440
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	< 400	< 380	< 390	< 440
Disulfoton	78	7,600	< 400	< 380	< 390	< 440
Ethyl methanesulfonate	--	--	< 400	< 380	< 390	< 440
Ethyl parathion (Parathion)	360,000	10,000,000	< 400	< 380	< 390	< 440
Famphur	--	--	< 400	< 380	< 390	< 440
Fluoranthene	3,200,000	110,000,000	1100	100J	120J	62J
Fluorene	3,800,000	110,000,000	40J	< 380	< 390	< 440
Hexachlorobenzene	960	50,000	< 400	< 380	< 390	< 440
Hexachlorobutadiene	1,200	560,000	< 400	< 380	< 390	< 440
Hexachlorocyclopentadiene	91,000	10,000,000	< 400	< 380	< 390	< 440
Hexachloroethane	560	2,800,000	< 400	< 380	< 390	< 440
Hexachlorophene	--	--	< 200,000	< 200,000	< 200,000	< 230,000
Hexachloropropene	--	--	< 400	< 380	< 390	< 440
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	290J	< 380	41J	24J
Isophorone	10,000	10,000,000	< 400	< 380	< 390	< 440
Isosafrole	--	--	< 400	< 380	< 390	< 440
m-Dinitrobenzene	100	280,000	< 400	< 380	< 390	< 440
Methapyrilene	--	--	< 81,000	< 78,000	< 79,000	< 89,000
Methyl methanesulfonate	2,600	800,000	< 400	< 380	< 390	< 440
Methyl parathion	420	48,000	< 400	< 380	< 390	< 440
Naphthalene	25,000	56,000,000	58J	< 380	< 390	< 440
Nitrobenzene	5,100	1,400,000	< 400	< 380	< 390	< 440
N-Nitrosodiethylamine	1.3	38	< 400	< 380	< 390	< 440
N-Nitrosodimethylamine	1.3	120	< 400	< 380	< 390	< 440
N-Nitrosodi-n-butylamine	14	15,000	< 400	< 380	< 390	< 440
n-Nitrosodi-n-propylamine	37	11,000	< 400	< 380	< 390	< 440
N-Nitrosodiphenylamine	83,000	16,000,000	< 400	< 380	< 390	< 440
N-Nitrosomethylethylamine	--	--	< 400	< 380	< 390	< 440
N-Nitrosomorpholine	--	--	< 400	< 380	< 390	< 440
N-Nitrosopiperidine	--	--	< 400	< 380	< 390	< 440
N-Nitrosopyrrolidine	--	--	< 400	< 380	< 390	< 440
O,O,O-Triethyl phosphorothioate	--	--	< 400	< 380	< 390	< 440
o-Toluidine	1,200	330,000	< 400	< 380	< 390	< 440
p-(Dimethylamino)azobenzene	150	17,000	< 400	< 380	< 390	< 440
Pentachlorobenzene	660,000	2,200,000	< 400	< 380	< 390	< 440
Pentachloronitrobenzene	20,000	310,000	< 400	< 380	< 390	< 440
Pentachlorophenol	5,000	660,000	< 2,000	< 2,000	< 2,000	< 2,300
Phenacetin	120,000	36,000,000	< 400	< 380	< 390	< 440
Phenanthrene	10,000,000	190,000,000	480	92J	82J	< 440
Phenol	400,000	190,000,000	< 400	< 380	< 390	< 440
Phorate	880	37,000	< 400	< 380	< 390	< 440
Pronamide	5,000	190,000,000	< 400	< 380	< 390	< 440
Pyrene	2,200,000	84,000,000	870	90J	91J	56J
Pyridine	2,000	190,000	< 400	< 380	< 390	< 440
Safrole	--	--	< 400	< 380	< 390	< 440
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	< 400	< 380	< 390	< 440
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 400	< 380	< 390	< 440

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	C-5 (0-2) 11/24/2003	C-6 (0-2) 12/2/2003	C-7 (0-2) 11/24/2003	LP-1 (0-2) 12/4/2003
Inorganics (mg/kg) [a]						
Antimony	27	1,100	< 2.2	< 2.1	< 2.1	< 2.4
Arsenic	150	53	10	9.8	7.6	13L
Barium	8,200	190,000	170K	100	150K	140
Beryllium	320	5,600	1.1	0.88	1.2	0.98
Cadmium	38	210	< 0.56	< 0.53	< 0.54	< 0.61
Chromium	190,000	190,000	130	21	31	24K
Cobalt	200	56,000	11	15	13	13K
Copper	36,000	100,000	24	23K	24	41
Lead	450	1,000	25L	17K	20L	81L
Mercury	10	840	0.14	0.033	0.11	0.091
Nickel	650	56,000	20	20	22	24
Selenium	26	14,000	< 5.6	< 1.1	< 1.1	< 1.2R[i]
Silver	84	14,000	0.14B	< 1.1L	< 1.1	< 1.2
Thallium	14	200	< 5.6	< 1.1	< 1.1	< 1.2L
Tin	6,100	190,000	2.3B	1.9B	2B	110
Vanadium	72,000	20,000	80	30	21	32
Zinc	12,000	190,000	86B	67K	86B	170J

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	LP-2 (0-2) 12/11/2003	SC-1 (0-2) 11/24/2003	SC-2 (0-2) 11/24/2003	SC-3 (0-2) 11/24/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	3,100,000	< 5	< 5.1	< 5.1	< 5.5
1,1,1-Trichloroethane	20,000	10,000,000	< 5	< 5.1	< 5.1	< 5.5
1,1,2,2-Tetrachloroethane	30	28,000	< 5	< 5.1	< 5.1	< 5.5
1,1,2-Trichloroethane	500	100,000	< 5	< 5.1	< 5.1	< 5.5
1,1-Dichloroethane	11,000	1,000,000	< 5	< 5.1	< 5.1	< 5.5
1,1-Dichloroethene	700	33,000	< 5	< 5.1	< 5.1	< 5.5
1,2,3-Trichloropropane	400,000	820	< 5	< 5.1	< 5.1	< 5.5
1,2,4-Trimethylbenzene	20,000	320,000	< 5	< 5.1	< 5.1	< 5.5
1,2-Dibromo-3-chloropropane	20	11,000	< 10	< 10	< 10	< 11
1,2-Dibromoethane (EDB)	5	930	< 5	< 5.1	< 5.1	< 5.5
1,2-Dichloroethane	500	63,000	< 5	< 5.1	< 5.1	< 5.5
1,2-Dichloropropane	500	160,000	< 5	< 5.1	< 5.1	< 5.5
1,3,5-Trimethylbenzene	6,200	320,000	< 5	< 5.1	< 5.1	< 5.5
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 25	< 26	< 26	43
2-Hexanone	--[c]	--	< 25	< 26	< 26	< 28
3-Chloropropene (Allylchloride)	4,100	370,000	< 5	< 5.1	< 5.1	< 5.5
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	< 25	< 26	< 26	< 28
Acetone	1,000,000	10,000,000	< 50	< 51	< 51	71
Acetonitrile	35,000	3,200,000	< 200	< 200	< 200	< 220
Acrolein (Propenal)	12	1,100	< 100	< 100	< 100	< 110
Acrylonitrile	270	24,000	< 100	< 100	< 100	< 110
Benzene	500	210,000	< 5	4.4J	2.7J	4.6J
Bromodichloromethane	10,000	45,000	< 5	< 5.1	< 5.1	< 5.5
Bromoform	10,000	1,500,000	< 5	< 5.1	< 5.1	< 5.5
Bromomethane (Methyl Bromide)	1,000	270,000	< 5	< 5.1	< 5.1	< 5.5
Carbon disulfide	410,000	10,000,000	< 5	< 5.1	< 5.1	< 5.5
Carbon tetrachloride	500	110,000	< 5	< 5.1	< 5.1	< 5.5
Chlorobenzene	10,000	10,000,000	< 5	7.2	2.7J	11
Chloroethane	90,000	10,000,000	< 5	< 5.1	< 5.1	< 5.5
Chloroform	10,000	17,000	< 5	< 5.1	< 5.1	< 5.5
Chloromethane (Methyl Chloride)	300	920,000	< 5	< 5.1	< 5.1	< 5.5
Chloroprene	4,100	370,000	< 5	< 5.1	< 5.1	< 5.5
cis-1,2-Dichloroethene	7,000	1,900,000	< 5	< 5.1	< 5.1	< 5.5
cis-1,3-Dichloropropene	2,600	410,000	< 5	< 5.1	< 5.1	< 5.5
Dibromochloromethane	--	--	< 5	< 5.1	< 5.1	< 5.5
Dibromomethane (Methylene bromide)	20,000	1,900,000	< 5	< 5.1	< 5.1	< 5.5
Dichlorodifluoromethane	100,000	10,000,000	< 5	< 5.1	< 5.1	< 5.5
Ethyl methacrylate	180,000	190,000,000	< 5	< 5.1	< 5.1	< 5.5
Ethylbenzene	70,000	10,000,000	< 5	1.7J	< 5.1	2.3J
Iodomethane (Methyl iodide)	--	--	< 5	< 5.1	< 5.1	< 5.5
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 200	< 200	< 200	< 220
Methacrylonitrile	410	37,000	< 100	< 100	< 100	< 110
Methyl methacrylate	410,000	10,000,000	< 5	< 5.1	< 5.1	< 5.5
Methylene chloride (Dichloromethane)	500	920,000	< 5	< 5.1	< 5.1	< 5.5
Pentachloroethane	--	--	< 25	< 26	< 26	< 28
Propionitrile	--	--	< 100	< 100	< 100	< 110
Styrene	24,000	10,000,000	< 5	< 5.1	< 5.1	< 5.5
Tetrachloroethene	500	1,500,000	< 5	20	7.6	28
Toluene	100,000	10,000,000	< 5	1.9J	< 5.1	2.5J
trans-1,2-Dichloroethene	10,000	3,700,000	< 5	< 5.1	< 5.1	< 5.5
trans-1,3-Dichloropropene	2,600	410,000	< 5	< 5.1	< 5.1	< 5.5
trans-1,4-Dichloro-2-butene	7	190,000,000	< 10	< 10	< 10	< 11
Trichloroethene	500	970,000	< 5	14	7.2	17
Trichlorofluoromethane	--	--	< 5	< 5.1	< 5.1	< 5.5
Vinyl acetate	120,000	10,000,000	< 10	< 10	< 10	< 11
Vinyl chloride	200	53,000	< 5	< 5.1	< 5.1	< 5.5
Xylenes, Total	1,000,000	10,000,000	< 10	4.8J	< 10	8.6J

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CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
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Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	LP-2 (0-2) 12/11/2003	SC-1 (0-2) 11/24/2003	SC-2 (0-2) 11/24/2003	SC-3 (0-2) 11/24/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	840,000	< 410	< 410	< 410	< 420
1,2,4-Trichlorobenzene	27,000	10,000,000	< 410	< 410	< 410	< 420
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 410	< 410	< 410	< 420
1,3,5-Trinitrobenzene	--	--	< 410	< 410	< 410	< 420
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 410	< 410	< 410	< 420
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	< 410	< 410	< 410	< 420
1,4-Dioxane	2,400	210,000	< 410	< 410	< 410	< 420
1,4-Naphthoquinone	--	--	< 410	< 410	< 410	< 420
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,100	< 2,100	< 2,100	< 2,200
1-Naphthylamine	1,100	44,000	< 410	< 410	< 410	< 420
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	< 410	< 410	< 410	< 420
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	< 410	< 410	< 410	< 420
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 410	< 410	< 410	< 420
2,4,6-Trichlorophenol	8,900	840,000	< 410	< 410	< 410	< 420
2,4-Dichlorophenol	2,000	8,400,000	< 410	< 410	< 410	< 420
2,4-Dimethylphenol	200,000	10,000,000	< 410	< 410	< 410	< 420
2,4-Dinitrophenol	4,100	5,600,000	< 2,100	< 2100	< 2,100	< 2,200
2,4-Dinitrotoluene	840	260,000	< 410	< 410	< 410	< 420
2,6-Dichlorophenol	--	--	< 410	< 410	< 410	< 420
2,6-Dinitrotoluene	10,000	2,800,000	< 410	< 410	< 410	< 420
2-Acetylaminofluorene	280	21,000	< 410	< 410	< 410	< 420
2-Chloronaphthalene	18,000,000	190,000,000	< 410	< 410	< 410	< 420
2-Chlorophenol	4,400	920,000	< 410	< 410	< 410	< 420
2-Methylnaphthalene	8,000,000	10,000,000	< 410	< 410	< 410	< 420
2-Naphthylamine	140	44,000	< 410	< 410	< 410	< 420
2-Nitroaniline (o-Nitroaniline)	580	160,000	< 2,100	< 2,100	< 2,100	< 2,200
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	< 410	< 410	< 410	< 420
2-Picoline	--	--	< 410	< 410	< 410	< 420
3,3'-Dichlorobenzidine	32,000	180,000	< 820	< 810	< 810	< 850
3,3'-Dimethylbenzidine	1,500	8,600	< 2,100	< 2,100	< 2100	< 2,200
3-Methylcholanthrene	--	--	< 410	< 410	< 410	< 420
3-Nitroaniline (m-Nitroaniline)	580	160,000	< 2,100	< 2,100	< 2,100	< 2,200
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,100	< 2,100	< 2,100	< 2,200
4-Aminobiphenyl	12	3,800	< 410	< 410	< 410	< 420
4-Bromophenylphenyl ether	--	--	< 410	< 410	< 410	< 420
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	< 410	< 410	< 410	< 420
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	< 820	< 810	< 810	< 850
4-Chlorophenylphenyl ether	--	--	< 410	< 410	< 410	< 420
4-Nitroaniline (p-Nitroaniline)	580	160,000	< 2,100	< 2,100	< 2,100	< 2,200
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	< 2,100	< 2,100	< 2,100	< 2,200
4-Nitroquinoline-1-oxide	--	--	< 4,100	< 4,100	< 4,100	< 4,200
5-Nitro-o-toluidine	--	--	< 410	< 410	< 410	< 420
7,12-Dimethylbenz(a)anthracene	--	--	< 410	< 410	< 410	< 420
Acenaphthene	4,700,000	170,000,000	< 410	< 410	< 410	< 420
Acenaphthylene	6,900,000	170,000,000	< 410	< 410	< 410	< 420
Acetophenone	1,000,000	10,000,000	< 410	< 410	< 410	< 420
alpha,alpha-Dimethylphenethylamine	--	--	< 84,000	< 83,000	< 83,000	< 86,000
Aniline	580	53,000	< 410	< 410	< 410	< 420
Anthracene	350,000	190,000,000	< 410	< 410	< 410	< 420
Aramite, Total	--	--	< 410	< 410	< 410	< 420
Benzo(a)anthracene	320,000	110,000	< 410	< 410	< 410	< 420
Benzo(a)pyrene	46,000	11,000	< 410	< 410	< 410	< 420
Benzo(b)fluoranthene	170,000	110,000	< 410	< 410	< 410	< 420
Benzo(g,h,i)perylene	180,000	170,000,000	< 410	< 410	< 410	< 420
Benzo(k)fluoranthene	610,000	1,100,000	< 410	< 410	< 410	< 420
Benzyl alcohol	3,100,000	10,000,000	< 410	< 410	< 410	< 420
bis(2-Chloroethoxy)methane	--	--	< 410	< 410	< 410	< 420

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	LP-2 (0-2) 12/11/2003	SC-1 (0-2) 11/24/2003	SC-2 (0-2) 11/24/2003	SC-3 (0-2) 11/24/2003
Semivolatile Organic Compounds cont'd. (ug/kg)						
bis(2-Chloroethyl)ether	55	5,000	< 410	< 410	< 410	< 420
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	57J	< 410	85J	210J
Butylbenzylphthalate	10,000,000	10,000,000	< 410	< 410	< 410	< 420
Chrysene	230,000	11,000,000	< 410	< 410	< 410	< 420
Cresol (ortho)	510,000	10,000,000	< 410	< 410	< 410	< 420
Cresol, m & p	51,000	14,000,000	< 410	< 410	< 410	< 420
Diallate, Total	1,000	93,000	< 410	< 410	< 410	< 420
Dibenzo(a,h)anthracene	160,000	11,000	< 410	< 410	< 410	< 420
Dibenzofuran	--	--	< 410	< 410	< 410	< 420
Diethylphthalate	500,000	10,000,000	< 410	< 410	< 410	< 420
Dimethoate	2,000	560,000	< 410	< 410	< 410	< 420
Dimethylphthalate	--	--	< 410	< 410	< 410	< 420
Di-n-butylphthalate	4,100,000	10,000,000	< 410	< 410	< 410	< 420
Di-n-octylphthalate	10,000,000	10,000,000	< 410	< 410	< 410	< 420
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	< 410	< 410	< 410	< 420
Disulfoton	78	7,600	< 410	< 410	< 410	< 420
Ethyl methanesulfonate	--	--	< 410	< 410	< 410	< 420
Ethyl parathion (Parathion)	360,000	10,000,000	< 410	< 410	< 410	< 420
Famphur	--	--	< 410	< 410	< 410	< 420
Fluoranthene	3,200,000	110,000,000	< 410	< 410	< 410	< 420
Fluorene	3,800,000	110,000,000	< 410	< 410	< 410	< 420
Hexachlorobenzene	960	50,000	< 410	< 410	< 410	< 420
Hexachlorobutadiene	1,200	560,000	< 410	< 410	< 410	< 420
Hexachlorocyclopentadiene	91,000	10,000,000	< 410	< 410	< 410	< 420
Hexachloroethane	560	2,800,000	< 410	< 410	< 410	< 420
Hexachlorophene	--	--	< 210,000	< 210,000	< 210,000	< 220,000
Hexachloropropene	--	--	< 410	< 410	< 410	< 420
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	< 410	< 410	< 410	< 420
Isophorone	10,000	10,000,000	< 410	< 410	< 410	< 420
Isosafrole	--	--	< 410	< 410	< 410	< 420
m-Dinitrobenzene	100	280,000	< 410	< 410	< 410	< 420
Methapyrilene	--	--	< 84,000	< 83,000	< 83,000	< 86,000
Methyl methanesulfonate	2,600	800,000	< 410	< 410	< 410	< 420
Methyl parathion	420	48,000	< 410	< 410	< 410	< 420
Naphthalene	25,000	56,000,000	< 410	< 410	< 410	< 420
Nitrobenzene	5,100	1,400,000	< 410	< 410	< 410	< 420
N-Nitrosodiethylamine	1.3	38	< 410	< 410	< 410	< 420
N-Nitrosodimethylamine	1.3	120	< 410	< 410	< 410	< 420
N-Nitrosodi-n-butylamine	14	15,000	< 410	< 410	< 410	< 420
n-Nitrosodi-n-propylamine	37	11,000	< 410	< 410	< 410	< 420
N-Nitrosodiphenylamine	83,000	16,000,000	< 410	< 410	< 410	< 420
N-Nitrosomethylethylamine	--	--	< 410	< 410	< 410	< 420
N-Nitrosomorpholine	--	--	< 410	< 410	< 410	< 420
N-Nitrosopiperidine	--	--	< 410	< 410	< 410	< 420
N-Nitrosopyrrolidine	--	--	< 410	< 410	< 410	< 420
O,O,O-Triethyl phosphorothioate	--	--	< 410	< 410	< 410	< 420
o-Toluidine	1,200	330,000	< 410	< 410	< 410	< 420
p-(Dimethylamino)azobenzene	150	17,000	< 410	< 410	< 410	< 420
Pentachlorobenzene	660,000	2,200,000	< 410	< 410	< 410	< 420
Pentachloronitrobenzene	20,000	310,000	< 410	< 410	< 410	< 420
Pentachlorophenol	5,000	660,000	< 2,100	< 2,100	< 2,100	< 2,200
Phenacetin	120,000	36,000,000	< 410	< 410	< 410	< 420
Phenanthrene	10,000,000	190,000,000	< 410	< 410	< 410	< 420
Phenol	400,000	190,000,000	< 410	< 410	< 410	< 420
Phorate	880	37,000	< 410	< 410	< 410	< 420
Pronamide	5,000	190,000,000	< 410	< 410	< 410	< 420
Pyrene	2,200,000	84,000,000	< 410	< 410	< 410	24J
Pyridine	2,000	190,000	< 410	< 410	< 410	< 420
Safrole	--	--	< 410	< 410	< 410	< 420
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	< 410	< 410	< 410	< 420
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 410	< 410	< 410	< 420

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	LP-2 (0-2) 12/11/2003	SC-1 (0-2) 11/24/2003	SC-2 (0-2) 11/24/2003	SC-3 (0-2) 11/24/2003
Inorganics (mg/kg) [a]						
Antimony	27	1,100	< 2.3R	< 2.4	< 2.3	< 2.4
Arsenic	150	53	11K	9.6	9.6	6.7
Barium	8,200	190,000	89	400K	220K	170K
Beryllium	320	5,600	0.94	1.4	1.3	1.2
Cadmium	38	210	< 0.57	< 0.6	< 0.57	< 0.6
Chromium	190,000	190,000	18	19	18	15
Cobalt	200	56,000	25	20	13	14
Copper	36,000	100,000	24	33	33	14B
Lead	450	1,000	21L	18L	17L	15L
Mercury	10	840	0.03J	0.038	0.037	0.059
Nickel	650	56,000	23	62	41	26
Selenium	26	14,000	< 1.1L	< 1.2	< 1.1	< 1.2
Silver	84	14,000	< 1.1	< 1.2	< 1.1	< 1.2
Thallium	14	200	< 1.1	< 1.2	< 1.1	< 1.2
Tin	6,100	190,000	1.8B	1.3B	1.6B	1.8B
Vanadium	72,000	20,000	25	17	13	21
Zinc	12,000	190,000	70	86B	74B	82B

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-1 (0-2) 12/8/2003	TF-2 (0-2) 12/12/2003	TF-3 (0-2) 12/8/2003	TF-4 (0-2) 12/12/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	3,100,000	< 5.4	< 5.4	< 4.9	< 5.9
1,1,1-Trichloroethane	20,000	10,000,000	< 5.4	< 5.4	< 4.9	< 5.9
1,1,2,2-Tetrachloroethane	30	28,000	< 5.4	< 5.4	< 4.9	< 5.9
1,1,2-Trichloroethane	500	100,000	< 5.4	< 5.4	< 4.9	< 5.9
1,1-Dichloroethane	11,000	1,000,000	< 5.4	< 5.4	< 4.9	< 5.9
1,1-Dichloroethene	700	33,000	< 5.4	< 5.4	< 4.9	< 5.9
1,2,3-Trichloropropane	400,000	820	< 5.4	< 5.4	< 4.9	< 5.9
1,2,4-Trimethylbenzene	20,000	320,000	20	< 5.4	< 4.9	< 5.9
1,2-Dibromo-3-chloropropane	20	11,000	< 11	< 11	< 9.8	< 12
1,2-Dibromoethane (EDB)	5	930	< 5.4	< 5.4	< 4.9	< 5.9
1,2-Dichloroethane	500	63,000	< 5.4	< 5.4	< 4.9	< 5.9
1,2-Dichloropropane	500	160,000	< 5.4	< 5.4	< 4.9	< 5.9
1,3,5-Trimethylbenzene	6,200	320,000	29	< 5.4	< 4.9	< 5.9
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 27	< 27	< 24	< 30
2-Hexanone	--[c]	--	< 27	< 27	< 24	< 30
3-Chloropropene (Allylchloride)	4,100	370,000	< 5.4	< 5.4	< 4.9	< 5.9
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	< 27	< 27	< 24	< 30
Acetone	1,000,000	10,000,000	43J	< 54	28J	< 59
Acetonitrile	35,000	3,200,000	< 220	< 220	< 200	< 240
Acrolein (Propenal)	12	1,100	< 110	< 110	< 98	< 120
Acrylonitrile	270	24,000	< 110	< 110	< 98	< 120
Benzene	500	210,000	< 5.4	< 5.4	< 4.9	< 5.9
Bromodichloromethane	10,000	45,000	< 5.4	< 5.4	< 4.9	< 5.9
Bromoform	10,000	1,500,000	< 5.4	< 5.4	< 4.9	< 5.9
Bromomethane (Methyl Bromide)	1,000	270,000	< 5.4	< 5.4	< 4.9	< 5.9
Carbon disulfide	410,000	10,000,000	< 5.4	< 5.4	< 4.9	< 5.9
Carbon tetrachloride	500	110,000	< 5.4	< 5.4	< 4.9	< 5.9
Chlorobenzene	10,000	10,000,000	< 5.4	< 5.4	< 4.9	1.6J
Chloroethane	90,000	10,000,000	< 5.4	< 5.4	< 4.9	< 5.9
Chloroform	10,000	17,000	< 5.4	< 5.4	< 4.9	< 5.9
Chloromethane (Methyl Chloride)	300	920,000	< 5.4	< 5.4	< 4.9	< 5.9
Chloroprene	4,100	370,000	< 5.4	< 5.4	< 4.9	< 5.9
cis-1,2-Dichloroethene	7,000	1,900,000	< 5.4	< 5.4	< 4.9	< 5.9
cis-1,3-Dichloropropene	2,600	410,000	< 5.4	< 5.4	< 4.9	< 5.9
Dibromochloromethane	--	--	< 5.4	< 5.4	< 4.9	< 5.9
Dibromomethane (Methylene bromide)	20,000	1,900,000	< 5.4	< 5.4	< 4.9	< 5.9
Dichlorodifluoromethane	100,000	10,000,000	< 5.4	< 5.4	< 4.9	< 5.9
Ethyl methacrylate	180,000	190,000,000	< 5.4	< 5.4	< 4.9	< 5.9
Ethylbenzene	70,000	10,000,000	3.1J	< 5.4	< 4.9	< 5.9
Iodomethane (Methyl iodide)	--	--	< 5.4	< 5.4	< 4.9	< 5.9
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 220	< 220	< 200	< 240
Methacrylonitrile	410	37,000	< 110	< 110	< 98	< 120
Methyl methacrylate	410,000	10,000,000	< 5.4	< 5.4	< 4.9	< 5.9
Methylene chloride (Dichloromethane)	500	920,000	< 5.4	< 5.4	< 4.9	< 5.9
Pentachloroethane	--	--	< 27	< 27	< 24	< 30
Propionitrile	--	--	< 110	< 110	< 98	< 120
Styrene	24,000	10,000,000	1.4J	< 5.4	< 4.9	< 5.9
Tetrachloroethene	500	1,500,000	< 5.4	< 5.4	< 4.9	< 5.9
Toluene	100,000	10,000,000	< 5.4	< 5.4	< 4.9	2.6J
trans-1,2-Dichloroethene	10,000	3,700,000	< 5.4	< 5.4	< 4.9	< 5.9
trans-1,3-Dichloropropene	2,600	410,000	< 5.4	< 5.4	< 4.9	< 5.9
trans-1,4-Dichloro-2-butene	7	190,000,000	< 11	< 11	< 9.8	< 12
Trichloroethene	500	970,000	< 5.4	1.4J	< 4.9	< 5.9
Trichlorofluoromethane	--	--	< 5.4	< 5.4	< 4.9	< 5.9
Vinyl acetate	120,000	10,000,000	< 11	< 11	< 9.8	< 12
Vinyl chloride	200	53,000	< 5.4	< 5.4	< 4.9	< 5.9
Xylenes, Total	1,000,000	10,000,000	12	< 11	< 9.8	< 12

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs(b) Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-1 (0-2) 12/8/2003	TF-2 (0-2) 12/12/2003	TF-3 (0-2) 12/8/2003	TF-4 (0-2) 12/12/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	840,000	< 420	< 400	< 400	< 400
1,2,4-Trichlorobenzene	27,000	10,000,000	< 420	< 400	< 400	< 400
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 420	< 400	< 400	< 400
1,3,5-Trinitrobenzene	--	--	< 420	< 400	< 400	< 400
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 420	< 400	< 400	< 400
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	< 420	< 400	< 400	< 400
1,4-Dioxane	2,400	210,000	< 420	< 400	< 400	< 400
1,4-Naphthoquinone	--	--	< 420	< 400	< 400	< 400
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,200	< 2,000	< 2,100	< 2,000
1-Naphthylamine	1,100	44,000	< 420	< 400	< 400	< 400
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	< 420	< 400	< 400	< 400
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	< 420	< 400	< 400	< 400
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 420	< 400	< 400	< 400
2,4,6-Trichlorophenol	8,900	840,000	< 420	< 400	< 400	< 400
2,4-Dichlorophenol	2,000	8,400,000	< 420	< 400	< 400	< 400
2,4-Dimethylphenol	200,000	10,000,000	< 420	< 400	< 400	< 400
2,4-Dinitrophenol	4,100	5,600,000	< 2,200	< 2,000	< 2,100	< 2,000
2,4-Dinitrotoluene	840	260,000	< 420	< 400	< 400	< 400
2,6-Dichlorophenol	--	--	< 420	< 400	< 400	< 400
2,6-Dinitrotoluene	10,000	2,800,000	< 420	< 400	< 400	< 400
2-Acetylaminofluorene	280	21,000	< 420	< 400	< 400	< 400
2-Chloronaphthalene	18,000,000	190,000,000	< 420	< 400	< 400	< 400
2-Chlorophenol	4,400	920,000	< 420	< 400	< 400	< 400
2-Methylnaphthalene	8,000,000	10,000,000	< 420	< 400	< 400	< 400
2-Naphthylamine	140	44,000	< 420	< 400	< 400	< 400
2-Nitroaniline (o-Nitroaniline)	580	160,000	< 2,200	< 2,000	< 2,100	< 2,000
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	< 420	< 400	< 400	< 400
2-Picoline	--	--	< 420	< 400	< 400	< 400
3,3'-Dichlorobenzidine	32,000	180,000	< 840	< 800	< 800	< 800
3,3'-Dimethylbenzidine	1,500	8,600	< 2,200	< 2,000	< 2,100	< 2,000
3-Methylcholanthrene	--	--	< 420	< 400	< 400	< 400
3-Nitroaniline (m-Nitroaniline)	580	160,000	< 2,200	< 2,000	< 2,100	< 2,000
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,200	< 2,000	< 2,100	< 2,000
4-Aminobiphenyl	12	3,800	< 420	< 400	< 400	< 400
4-Bromophenylphenyl ether	--	--	< 420	< 400	< 400	< 400
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	< 420	< 400	< 400	< 400
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	< 840	< 800	< 800	< 800
4-Chlorophenylphenyl ether	--	--	< 420	< 400	< 400	< 400
4-Nitroaniline (p-Nitroaniline)	580	160,000	< 2,200	< 2,000	< 2,100	< 2,000
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	< 2,200	< 2,000	< 2,100	< 2,000
4-Nitroquinoline-1-oxide	--	--	< 4,200	< 4,000	< 4,000	< 4,000
5-Nitro-o-toluidine	--	--	< 420	< 400	< 400	< 400
7,12-Dimethylbenz(a)anthracene	--	--	< 420	< 400	< 400	< 400
Acenaphthene	4,700,000	170,000,000	< 420	< 400	< 400	< 400
Acenaphthylene	6,900,000	170,000,000	< 420	< 400	< 400	< 400
Acetophenone	1,000,000	10,000,000	< 420	< 400	< 400	< 400
alpha,alpha-Dimethylphenethylamine	--	--	< 85,000	< 81,000	< 82,000	< 81,000
Aniline	580	53,000	< 420	< 400	< 400	< 400
Anthracene	350,000	190,000,000	< 420	70J	< 400	< 400
Aramite, Total	--	--	< 420	< 400	< 400	< 400
Benzo(a)anthracene	320,000	110,000	48J	360J	< 400	< 400
Benzo(a)pyrene	46,000	11,000	78J	320J	< 400	< 400
Benzo(b)fluoranthene	170,000	110,000	64J	300J	< 400	< 400
Benzo(g,h,i)perylene	180,000	170,000,000	150J	200J	< 400	< 400
Benzo(k)fluoranthene	610,000	1,100,000	82J	270J	< 400	< 400
Benzyl alcohol	3,100,000	10,000,000	< 420	< 400	< 400	< 400
bis(2-Chloroethoxy)methane	--	--	< 420	< 400	< 400	< 400

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-1 (0-2) 12/8/2003	TF-2 (0-2) 12/12/2003	TF-3 (0-2) 12/8/2003	TF-4 (0-2) 12/12/2003
Sample ID: / Sample Date:						
Semivolatile Organic Compounds cont'd. (ug/kg)						
bis(2-Chloroethyl)ether	55	5,000	< 420	< 400	< 400	< 400
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	690B	< 400	300B	< 400
Butylbenzylphthalate	10,000,000	10,000,000	< 420	< 400	< 400	< 400
Chrysene	230,000	11,000,000	62J	370J	< 400	< 400
Cresol (ortho)	510,000	10,000,000	< 420	< 400	< 400	< 400
Cresol, m & p	51,000	14,000,000	< 420	< 400	< 400	< 400
Diallate, Total	1,000	93,000	< 420	< 400	< 400	< 400
Dibenzo(a,h)anthracene	160,000	11,000	120J	66J	< 400	< 400
Dibenzofuran	--	--	< 420	< 400	< 400	< 400
Diethylphthalate	500,000	10,000,000	< 420	< 400	< 400	< 400
Dimethoate	2,000	560,000	< 420	< 400	< 400	< 400
Dimethylphthalate	--	--	< 420	< 400	< 400	< 400
Di-n-butylphthalate	4,100,000	10,000,000	< 420	< 400	< 400	< 400
Di-n-octylphthalate	10,000,000	10,000,000	< 420	< 400	< 400	< 400
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	< 420	< 400	< 400	< 400
Disulfoton	78	7,600	< 420	< 400	< 400	< 400
Ethyl methanesulfonate	--	--	< 420	< 400	< 400	< 400
Ethyl parathion (Parathion)	360,000	10,000,000	< 420	< 400	< 400	< 400
Famphur	--	--	< 420	< 400	< 400	< 400
Fluoranthene	3,200,000	110,000,000	110J	640	< 400	< 400
Fluorene	3,800,000	110,000,000	< 420	< 400	< 400	< 400
Hexachlorobenzene	960	50,000	< 420	< 400	< 400	< 400
Hexachlorobutadiene	1,200	560,000	< 420	< 400	< 400	< 400
Hexachlorocyclopentadiene	91,000	10,000,000	< 420	< 400	< 400	< 400
Hexachloroethane	560	2,800,000	< 420	< 400	< 400	< 400
Hexachlorophene	--	--	< 220,000	< 200,000	< 210,000	< 200,000
Hexachloropropene	--	--	< 420	< 400	< 400	< 400
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	110J	220J	< 400	< 400
Isophorone	10,000	10,000,000	< 420	< 400	< 400	< 400
Isosafrole	--	--	< 420	< 400	< 400	< 400
m-Dinitrobenzene	100	280,000	< 420	< 400	< 400	< 400
Methapyrilene	--	--	< 85,000	< 81,000	< 82,000	< 81,000
Methyl methanesulfonate	2,600	800,000	< 420	< 400	< 400	< 400
Methyl parathion	420	48,000	< 420	< 400	< 400	< 400
Naphthalene	25,000	56,000,000	< 420	< 400	< 400	< 400
Nitrobenzene	5,100	1,400,000	< 420	< 400	< 400	< 400
N-Nitrosodiethylamine	1.3	38	< 420	< 400	< 400	< 400
N-Nitrosodimethylamine	1.3	120	< 420	< 400	< 400	< 400
N-Nitrosodi-n-butylamine	14	15,000	< 420	< 400	< 400	< 400
n-Nitrosodi-n-propylamine	37	11,000	< 420	< 400	< 400	< 400
N-Nitrosodiphenylamine	83,000	16,000,000	< 420	< 400	< 400	< 400
N-Nitrosomethylethylamine	--	--	< 420	< 400	< 400	< 400
N-Nitrosomorpholine	--	--	< 420	< 400	< 400	< 400
N-Nitrosopiperidine	--	--	< 420	< 400	< 400	< 400
N-Nitrosopyrrolidine	--	--	< 420	< 400	< 400	< 400
O,O,O-Triethyl phosphorothioate	--	--	< 420	< 400	< 400	< 400
o-Toluidine	1,200	330,000	< 420	< 400	< 400	< 400
p-(Dimethylamino)azobenzene	150	17,000	< 420	< 400	< 400	< 400
Pentachlorobenzene	660,000	2,200,000	< 420	< 400	< 400	< 400
Pentachloronitrobenzene	20,000	310,000	< 420	< 400	< 400	< 400
Pentachlorophenol	5,000	660,000	< 2,200	< 2,000	< 2,100	< 2,000
Phenacetin	120,000	36,000,000	< 420	< 400	< 400	< 400
Phenanthrene	10,000,000	190,000,000	71J	310J	< 400	< 400
Phenol	400,000	190,000,000	< 420	< 400	< 400	< 400
Phorate	880	37,000	< 420	< 400	< 400	< 400
Pronamide	5,000	190,000,000	< 420	< 400	< 400	< 400
Pyrene	2,200,000	84,000,000	100J	510	< 400	< 400
Pyridine	2,000	190,000	< 420	< 400	< 400	< 400
Safrole	--	--	< 420	< 400	< 400	< 400
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	< 420	< 400	< 400	< 400
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 420	< 400	< 400	< 400

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-1 (0-2) 12/8/2003	TF-2 (0-2) 12/12/2003	TF-3 (0-2) 12/8/2003	TF-4 (0-2) 12/12/2003
Inorganics (mg/kg) [a]						
Antimony	27	1,100	< 2.5	0.73J	< 2.2	< 2.2
Arsenic	150	53	8.5L	9	6.5L	7.4
Barium	8,200	190,000	230	340	170	150
Beryllium	320	5,600	1.4	2.4	0.86	1.1
Cadmium	38	210	< 0.62	0.33J	< 0.55	0.2J
Chromium	190,000	190,000	26K	34	20K	32
Cobalt	200	56,000	14K	12	6.3K	17
Copper	36,000	100,000	33	29	19	29
Lead	450	1,000	34L	25L	8.4L	26L
Mercury	10	840	0.099	0.22	0.036	0.2
Nickel	650	56,000	32	23	22	30
Selenium	26	14,000	< 1.2R	< 1.1	< 1.1R	< 1.1
Silver	84	14,000	< 1.2	< 1.1	< 1.1	< 1.1
Thallium	14	200	< 1.2L	< 1.1L	< 1.1L	< 1.1L
Tin	6,100	190,000	3.1B	3.1B	2B	2.8B
Vanadium	72,000	20,000	29	31	25	41
Zinc	12,000	190,000	160	86	60	100

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	Sample ID: / Sample Date: PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-5 (0-2) 12/8/2003	TF-6 (0-2) 12/8/2003	TF-7 (0-2) 12/12/2003	TF-8 (0-2) 12/12/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	3,100,000	< 5.2	< 5.3	< 5.6	< 200
1,1,1-Trichloroethane	20,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
1,1,2,2-Tetrachloroethane	30	28,000	< 5.2	< 5.3	< 5.6	< 200
1,1,2-Trichloroethane	500	100,000	< 5.2	< 5.3	< 5.6	< 200
1,1-Dichloroethane	11,000	1,000,000	< 5.2	< 5.3	< 5.6	< 200
1,1-Dichloroethene	700	33,000	< 5.2	< 5.3	< 5.6	< 200
1,2,3-Trichloropropane	400,000	820	< 5.2	< 5.3	< 5.6	< 200
1,2,4-Trimethylbenzene	20,000	320,000	< 5.2	< 5.3	1.5J	< 200
1,2-Dibromo-3-chloropropane	20	11,000	< 10	< 10	< 11	< 410
1,2-Dibromoethane (EDB)	5	930	< 5.2	< 5.3	< 5.6	< 200
1,2-Dichloroethane	500	63,000	< 5.2	< 5.3	< 5.6	< 200
1,2-Dichloropropane	500	160,000	< 5.2	< 5.3	< 5.6	< 200
1,3,5-Trimethylbenzene	6,200	320,000	< 5.2	< 5.3	< 5.6	< 200
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 26	< 26	< 28	< 1,000
2-Hexanone	--[c]	--	< 26	< 26	< 28	< 1,000
3-Chloropropene (Allylchloride)	4,100	370,000	< 5.2	< 5.3	< 5.6	< 200
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	< 26	< 26	< 28	< 1,000
Acetone	1,000,000	10,000,000	< 52	< 53	< 56	< 2,000
Acetonitrile	35,000	3,200,000	< 210	< 210	< 220	< 8,200
Acrolein (Propenal)	12	1,100	< 100	< 100	< 110	< 4,100
Acrylonitrile	270	24,000	< 100	< 100	< 110	< 4,100
Benzene	500	210,000	< 5.2	< 5.3	< 5.6	< 200
Bromodichloromethane	10,000	45,000	< 5.2	< 5.3	< 5.6	< 200
Bromoform	10,000	1,500,000	< 5.2	< 5.3	< 5.6	< 200
Bromomethane (Methyl Bromide)	1,000	270,000	< 5.2	< 5.3	< 5.6	< 200
Carbon disulfide	410,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Carbon tetrachloride	500	110,000	< 5.2	< 5.3	< 5.6	< 200
Chlorobenzene	10,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Chloroethane	90,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Chloroform	10,000	17,000	< 5.2	< 5.3	< 5.6	< 200
Chloromethane (Methyl Chloride)	300	920,000	< 5.2	< 5.3	< 5.6	< 200
Chloroprene	4,100	370,000	< 5.2	< 5.3	< 5.6	< 200
cis-1,2-Dichloroethene	7,000	1,900,000	< 5.2	< 5.3	< 5.6	< 200
cis-1,3-Dichloropropene	2,600	410,000	< 5.2	< 5.3	< 5.6	< 200
Dibromochloromethane	--	--	< 5.2	< 5.3	< 5.6	< 200
Dibromomethane (Methylene bromide)	20,000	1,900,000	< 5.2	< 5.3	< 5.6	< 200
Dichlorodifluoromethane	100,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Ethyl methacrylate	180,000	190,000,000	< 5.2	< 5.3	< 5.6	< 200
Ethylbenzene	70,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Iodomethane (Methyl iodide)	--	--	< 5.2	< 5.3	< 5.6	< 200
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 210	< 210	< 220	< 8,200
Methacrylonitrile	410	37,000	< 100	< 100	< 110	< 4,100
Methyl methacrylate	410,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Methylene chloride (Dichloromethane)	500	920,000	< 5.2	< 5.3	< 5.6	< 200
Pentachloroethane	--	--	< 26	< 26	< 28	< 1,000
Propionitrile	--	--	< 100	< 100	< 110	< 4,100
Styrene	24,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
Tetrachloroethene	500	1,500,000	< 5.2	< 5.3	< 5.6	< 200
Toluene	100,000	10,000,000	< 5.2	< 5.3	< 5.6	< 200
trans-1,2-Dichloroethene	10,000	3,700,000	< 5.2	< 5.3	< 5.6	< 200
trans-1,3-Dichloropropene	2,600	410,000	< 5.2	< 5.3	< 5.6	< 200
trans-1,4-Dichloro-2-butene	7	190,000,000	< 10	< 10	< 11	< 410
Trichloroethene	500	970,000	< 5.2	< 5.3	< 5.6	< 200
Trichlorofluoromethane	--	--	< 5.2	< 5.3	< 5.6	< 200
Vinyl acetate	120,000	10,000,000	< 10	< 10	< 11	< 410
Vinyl chloride	200	53,000	< 5.2	< 5.3	< 5.6	< 200
Xylenes, Total	1,000,000	10,000,000	< 10	< 10	< 11	< 410

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[(b)] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-5 (0-2) 12/8/2003	TF-6 (0-2) 12/8/2003	TF-7 (0-2) 12/12/2003	TF-8 (0-2) 12/12/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	840,000	< 410	< 420	< 410	< 410
1,2,4-Trichlorobenzene	27,000	10,000,000	< 410	< 420	< 410	< 410
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 410	< 420	< 410	< 410
1,3,5-Trinitrobenzene	--	--	< 410	< 420	< 410	< 410
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 410	< 420	< 410	< 410
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	< 410	< 420	< 410	< 410
1,4-Dioxane	2,400	210,000	< 410	< 420	< 410	< 410
1,4-Naphthoquinone	--	--	< 410	< 420	< 410	< 410
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,100	< 2,200	< 2,100	< 2,100
1-Naphthylamine	1,100	44,000	< 410	< 420	< 410	< 410
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	< 410	< 420	< 410	< 410
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	< 410	< 420	< 410	< 410
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 410	< 420	< 410	< 410
2,4,6-Trichlorophenol	8,900	840,000	< 410	< 420	< 410	< 410
2,4-Dichlorophenol	2,000	8,400,000	< 410	< 420	< 410	< 410
2,4-Dimethylphenol	200,000	10,000,000	< 410	< 420	< 410	< 410
2,4-Dinitrophenol	4,100	5,600,000	< 2,100	< 2,200	< 2,100	< 2,100
2,4-Dinitrotoluene	840	260,000	< 410	< 420	< 410	< 410
2,6-Dichlorophenol	--	--	< 410	< 420	< 410	< 410
2,6-Dinitrotoluene	10,000	2,800,000	< 410	< 420	< 410	< 410
2-Acetylaminofluorene	280	21,000	< 410	< 420	< 410	< 410
2-Chloronaphthalene	18,000,000	190,000,000	< 410	< 420	< 410	< 410
2-Chlorophenol	4,400	920,000	< 410	< 420	< 410	< 410
2-Methylnaphthalene	8,000,000	10,000,000	< 410	< 420	< 410	< 410
2-Naphthylamine	140	44,000	< 410	< 420	< 410	< 410
2-Nitroaniline (o-Nitroaniline)	580	160,000	< 2,100	< 2,200	< 2,100	< 2,100
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	< 410	< 420	< 410	< 410
2-Picoline	--	--	< 410	< 420	< 410	< 410
3,3'-Dichlorobenzidine	32,000	180,000	< 820	< 840	< 820	< 810
3,3'-Dimethylbenzidine	1,500	8,600	< 2,100	< 2,200	< 2,100	< 2,100
3-Methylcholanthrene	--	--	< 410	< 420	< 410	< 410
3-Nitroaniline (m-Nitroaniline)	580	160,000	< 2,100	< 2,200	< 2,100	< 2,100
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,100	< 2,200	< 2,100	< 2,100
4-Aminobiphenyl	12	3,800	< 410	< 420	< 410	< 410
4-Bromophenylphenyl ether	--	--	< 410	< 420	< 410	< 410
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	< 410	< 420	< 410	< 410
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	< 820	< 840	< 820	< 810
4-Chlorophenylphenyl ether	--	--	< 410	< 420	< 410	< 410
4-Nitroaniline (p-Nitroaniline)	580	160,000	< 2,100	< 2,200	< 2,100	< 2,100
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	< 2,100	< 2,200	< 2,100	< 2,100
4-Nitroquinoline-1-oxide	--	--	< 4,100	< 4,200	< 4,100	< 4,100
5-Nitro-o-toluidine	--	--	< 410	< 420	< 410	< 410
7,12-Dimethylbenz(a)anthracene	--	--	< 410	< 420	< 410	< 410
Acenaphthene	4,700,000	170,000,000	< 410	< 420	< 410	< 410
Acenaphthylene	6,900,000	170,000,000	< 410	< 420	< 410	< 410
Acetophenone	1,000,000	10,000,000	< 410	< 420	< 410	< 410
alpha,alpha-Dimethylphenethylamine	--	--	< 84,000	< 85,000	< 84,000	< 83,000
Aniline	580	53,000	< 410	< 420	< 410	< 410
Anthracene	350,000	190,000,000	< 410	< 420	< 410	< 410
Aramite, Total	--	--	< 410	< 420	< 410	< 410
Benzo(a)anthracene	320,000	110,000	< 410	< 420	< 410	< 410
Benzo(a)pyrene	46,000	11,000	< 410	< 420	< 410	< 410
Benzo(b)fluoranthene	170,000	110,000	< 410	< 420	< 410	< 410
Benzo(g,h,i)perylene	180,000	170,000,000	58J	38J	< 410	29J
Benzo(k)fluoranthene	610,000	1,100,000	< 410	< 420	< 410	40J
Benzyl alcohol	3,100,000	10,000,000	< 410	< 420	< 410	< 410
bis(2-Chloroethoxy)methane	--	--	< 410	< 420	< 410	< 410

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[(a)] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-5 (0-2) 12/8/2003	TF-6 (0-2) 12/8/2003	TF-7 (0-2) 12/12/2003	TF-8 (0-2) 12/12/2003
Semivolatile Organic Compounds cont'd. (ug/kg)						
bis(2-Chloroethyl)ether	55	5,000	< 410	< 420	< 410	< 410
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	580B	580B	< 410	< 410
Butylbenzylphthalate	10,000,000	10,000,000	< 410	< 420	< 410	< 410
Chrysene	230,000	11,000,000	< 410	< 420	< 410	< 410
Cresol (ortho)	510,000	10,000,000	< 410	< 420	< 410	< 410
Cresol, m & p	51,000	14,000,000	< 410	< 420	< 410	< 410
Diallate, Total	1,000	93,000	< 410	< 420	< 410	< 410
Dibenzo(a,h)anthracene	160,000	11,000	58J	< 420	< 410	< 410
Dibenzofuran	--	--	< 410	< 420	< 410	< 410
Diethylphthalate	500,000	10,000,000	< 410	< 420	< 410	< 410
Dimethoate	2,000	560,000	< 410	< 420	< 410	< 410
Dimethylphthalate	--	--	< 410	< 420	< 410	< 410
Di-n-butylphthalate	4,100,000	10,000,000	< 410	< 420	< 410	< 410
Di-n-octylphthalate	10,000,000	10,000,000	< 410	< 420	< 410	< 410
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	< 410	< 420	< 410	< 410
Disulfoton	78	7,600	< 410	< 420	< 410	< 410
Ethyl methanesulfonate	--	--	< 410	< 420	< 410	< 410
Ethyl parathion (Parathion)	360,000	10,000,000	< 410	< 420	< 410	< 410
Famphur	--	--	< 410	< 420	< 410	< 410
Fluoranthene	3,200,000	110,000,000	< 410	< 420	< 410	< 410
Fluorene	3,800,000	110,000,000	< 410	< 420	< 410	< 410
Hexachlorobenzene	960	50,000	< 410	< 420	< 410	< 410
Hexachlorobutadiene	1,200	560,000	< 410	< 420	< 410	< 410
Hexachlorocyclopentadiene	91,000	10,000,000	< 410	< 420	< 410	< 410
Hexachloroethane	560	2,800,000	< 410	< 420	< 410	< 410
Hexachlorophene	--	--	< 210,000	< 220,000	< 210,000	< 210,000
Hexachloropropene	--	--	< 410	< 420	< 410	< 410
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	53J	30J	< 410	24J
Isophorone	10,000	10,000,000	< 410	< 420	< 410	< 410
Isosafrole	--	--	< 410	< 420	< 410	< 410
m-Dinitrobenzene	100	280,000	< 410	< 420	< 410	< 410
Methapyrilene	--	--	< 84,000	< 85,000	< 84,000	< 83,000
Methyl methanesulfonate	2,600	800,000	< 410	< 420	< 410	< 410
Methyl parathion	420	48,000	< 410	< 420	< 410	< 410
Naphthalene	25,000	56,000,000	< 410	< 420	< 410	< 410
Nitrobenzene	5,100	1,400,000	< 410	< 420	< 410	< 410
N-Nitrosodiethylamine	1.3	38	< 410	< 420	< 410	< 410
N-Nitrosodimethylamine	1.3	120	< 410	< 420	< 410	< 410
N-Nitrosodi-n-butylamine	14	15,000	< 410	< 420	< 410	< 410
n-Nitrosodi-n-propylamine	37	11,000	< 410	< 420	< 410	< 410
N-Nitrosodiphenylamine	83,000	16,000,000	< 410	< 420	< 410	< 410
N-Nitrosomethylethylamine	--	--	< 410	< 420	< 410	< 410
N-Nitrosomorpholine	--	--	< 410	< 420	< 410	< 410
N-Nitrosopiperidine	--	--	< 410	< 420	< 410	< 410
N-Nitrosopyrrolidine	--	--	< 410	< 420	< 410	< 410
O,O,O-Triethyl phosphorothioate	--	--	< 410	< 420	< 410	< 410
o-Toluidine	1,200	330,000	< 410	< 420	< 410	< 410
p-(Dimethylamino)azobenzene	150	17,000	< 410	< 420	< 410	< 410
Pentachlorobenzene	660,000	2,200,000	< 410	< 420	< 410	< 410
Pentachloronitrobenzene	20,000	310,000	< 410	< 420	< 410	< 410
Pentachlorophenol	5,000	660,000	< 2,100	< 2,200	< 2,100	< 2,100
Phenacetin	120,000	36,000,000	< 410	< 420	< 410	< 410
Phenanthrene	10,000,000	190,000,000	< 410	< 420	< 410	< 410
Phenol	400,000	190,000,000	< 410	< 420	< 410	< 410
Phorate	880	37,000	< 410	< 420	< 410	< 410
Pronamide	5,000	190,000,000	< 410	< 420	< 410	< 410
Pyrene	2,200,000	84,000,000	< 410	< 420	< 410	32J
Pyridine	2,000	190,000	< 410	< 420	< 410	< 410
Safrole	--	--	< 410	< 420	< 410	< 410
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	< 410	< 420	< 410	< 410
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 410	< 420	< 410	< 410

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	TF-5 (0-2) 12/8/2003	TF-6 (0-2) 12/8/2003	TF-7 (0-2) 12/12/2003	TF-8 (0-2) 12/12/2003
Inorganics (mg/kg) [a]						
Antimony	27	1,100	< 2.2	< 2.4	< 2.2	< 2.2
Arsenic	150	53	13L	14L	10	11
Barium	8,200	190,000	160	99	74	64
Beryllium	320	5,600	1.4	0.9	0.86	0.72
Cadmium	38	210	0.54B	0.24B	< 0.56	< 0.56
Chromium	190,000	190,000	27K	27K	28	25
Cobalt	200	56,000	10K	9.5K	12	8.7
Copper	36,000	100,000	31	25	25	22
Lead	450	1,000	20L	18L	15L	16L
Mercury	10	840	0.044	0.068	0.039	0.062K
Nickel	650	56,000	33	17	22	19
Selenium	26	14,000	< 1.1K	< 1.2R	< 1.1	< 1.1
Silver	84	14,000	< 1.1	< 1.2	< 1.1	< 1.1
Thallium	14	200	< 1.1L	< 1.2L	< 1.1L	< 1.1L
Tin	6,100	190,000	1.8B	2.6B	2.3B	2.4B
Vanadium	72,000	20,000	39	40	37	36
Zinc	12,000	190,000	77	64	70	63

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	UP-1 (0-2) 12/4/2003	UP-2 (0-2) 12/4/2003	UP-4 (0-2) 12/4/2003	UP-5 (0-2) 12/11/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	3,100,000	< 5.9	< 5.5	< 6	< 3.9
1,1,1-Trichloroethane	20,000	10,000,000	< 5.9	< 5.5	< 6	< 3.9
1,1,2,2-Tetrachloroethane	30	28,000	< 5.9	< 5.5	< 6	< 3.9
1,1,2-Trichloroethane	500	100,000	< 5.9	< 5.5	< 6	< 3.9
1,1-Dichloroethane	11,000	1,000,000	< 5.9	< 5.5	< 6	< 3.9
1,1-Dichloroethene	700	33,000	< 5.9	< 5.5	< 6	< 3.9
1,2,3-Trichloropropane	400,000	820	< 5.9	< 5.5	< 6	< 3.9
1,2,4-Trimethylbenzene	20,000	320,000	5.8J	8.6	710	< 3.9
1,2-Dibromo-3-chloropropane	20	11,000	< 12	< 11	< 12	< 7.8
1,2-Dibromoethane (EDB)	5	930	< 5.9	< 5.5	< 6	< 3.9
1,2-Dichloroethane	500	63,000	< 5.9	< 5.5	< 6	< 3.9
1,2-Dichloropropane	500	160,000	< 5.9	< 5.5	< 6	< 3.9
1,3,5-Trimethylbenzene	6,200	320,000	3.6J	6.4	150	< 3.9
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 30	< 28	< 30	< 19
2-Hexanone	--[c]	--	< 30	< 28	< 30	< 19
3-Chloropropene (Allylchloride)	4,100	370,000	< 5.9	< 5.5	< 6	< 3.9
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	< 30	< 28	< 30	< 19
Acetone	1,000,000	10,000,000	< 59	32J	41J	22J
Acetonitrile	35,000	3,200,000	< 240	< 220	< 240	< 160
Acrolein (Propenal)	12	1,100	< 120	< 110	< 120	< 78
Acrylonitrile	270	24,000	< 120	< 110	< 120	< 78
Benzene	500	210,000	< 5.9	< 5.5	2.6J	< 3.9
Bromodichloromethane	10,000	45,000	< 5.9	< 5.5	< 6	< 3.9
Bromoform	10,000	1,500,000	< 5.9	< 5.5	< 6	< 3.9
Bromomethane (Methyl Bromide)	1,000	270,000	< 5.9	< 5.5	< 6	< 3.9
Carbon disulfide	410,000	10,000,000	< 5.9	< 5.5	2.4J	< 3.9
Carbon tetrachloride	500	110,000	< 5.9	< 5.5	< 6	< 3.9
Chlorobenzene	10,000	10,000,000	1.7J	1.7J	< 6	< 3.9
Chloroethane	90,000	10,000,000	< 5.9	< 5.5	< 6	< 3.9
Chloroform	10,000	17,000	< 5.9	< 5.5	< 6	< 3.9
Chloromethane (Methyl Chloride)	300	920,000	< 5.9	< 5.5	< 6	< 3.9
Chloroprene	4,100	370,000	< 5.9	< 5.5	< 6	< 3.9
cis-1,2-Dichloroethene	7,000	1,900,000	< 5.9	< 5.5	< 6	< 3.9
cis-1,3-Dichloropropene	2,600	410,000	< 5.9	< 5.5	< 6	< 3.9
Dibromochloromethane	--	--	< 5.9	< 5.5	< 6	< 3.9
Dibromomethane (Methylene bromide)	20,000	1,900,000	< 5.9	< 5.5	< 6	< 3.9
Dichlorodifluoromethane	100,000	10,000,000	< 5.9	< 5.5	< 6	< 3.9
Ethyl methacrylate	180,000	190,000,000	< 5.9	< 5.5	< 6	< 3.9
Ethylbenzene	70,000	10,000,000	1.3J	< 5.5	400	< 3.9
Iodomethane (Methyl iodide)	--	--	< 5.9	< 5.5	< 6	< 3.9
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 240	< 220	< 240	< 160
Methacrylonitrile	410	37,000	< 120	< 110	< 120	< 78
Methyl methacrylate	410,000	10,000,000	< 5.9	< 5.5	< 6	< 3.9
Methylene chloride (Dichloromethane)	500	920,000	< 5.9	< 5.5	< 6	< 3.9
Pentachloroethane	--	--	< 30	< 28	< 30	< 19
Propionitrile	--	--	< 120	< 110	< 120	< 78
Styrene	24,000	10,000,000	< 5.9	< 5.5	3.5J	< 3.9
Tetrachloroethene	500	1,500,000	1.8J	1.9J	< 6	< 3.9
Toluene	100,000	10,000,000	< 5.9	< 5.5	2.4J	< 3.9
trans-1,2-Dichloroethene	10,000	3,700,000	< 5.9	< 5.5	< 6	< 3.9
trans-1,3-Dichloropropene	2,600	410,000	< 5.9	< 5.5	< 6	< 3.9
trans-1,4-Dichloro-2-butene	7	190,000,000	< 12	< 11	< 12	< 7.8
Trichloroethene	500	970,000	4.2	4.6J	< 6	< 3.9
Trichlorofluoromethane	--	--	< 5.9	< 5.5	< 6	< 3.9
Vinyl acetate	120,000	10,000,000	< 12	< 11	< 12	< 7.8
Vinyl chloride	200	53,000	< 5.9	< 5.5	< 6	< 3.9
Xylenes, Total	1,000,000	10,000,000	5.2J	6.6J	59	< 7.8

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	UP-1 (0-2) 12/4/2003	UP-2 (0-2) 12/4/2003	UP-4 (0-2) 12/4/2003	UP-5 (0-2) 12/11/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	840,000	< 420	< 420	< 420	< 350
1,2,4-Trichlorobenzene	27,000	10,000,000	< 420	< 420	< 420	< 350
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 420	< 420	< 420	< 350
1,3,5-Trinitrobenzene	--	--	< 420	< 420	< 420	< 350
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 420	< 420	< 420	< 350
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	< 420	< 420	< 420	< 350
1,4-Dioxane	2,400	210,000	< 420	< 420	< 420	< 350
1,4-Naphthoquinone	--	--	< 420	< 420	< 420	< 350
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,200	< 2,200	< 2,200	< 1,800
1-Naphthylamine	1,100	44,000	< 420	< 420	< 420	< 350
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	< 420	< 420	< 420	< 350
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	< 420	< 420	< 420	< 350
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 420	< 420	< 420	< 350
2,4,6-Trichlorophenol	8,900	840,000	< 420	< 420	< 420	< 350
2,4-Dichlorophenol	2,000	8,400,000	< 420	< 420	< 420	< 350
2,4-Dimethylphenol	200,000	10,000,000	< 420	< 420	< 420	< 350
2,4-Dinitrophenol	4,100	5,600,000	< 2,200	< 2,200	< 2,200	< 1,800
2,4-Dinitrotoluene	840	260,000	< 420	< 420	< 420	< 350
2,6-Dichlorophenol	--	--	< 420	< 420	< 420	< 350
2,6-Dinitrotoluene	10,000	2,800,000	< 420	< 420	< 420	< 350
2-Acetylaminofluorene	280	21,000	< 420	< 420	< 420	< 350
2-Chloronaphthalene	18,000,000	190,000,000	< 420	< 420	< 420	< 350
2-Chlorophenol	4,400	920,000	< 420	< 420	< 420	< 350
2-Methylnaphthalene	8,000,000	10,000,000	42J	< 420	750	58J
2-Naphthylamine	140	44,000	< 420	< 420	< 420	< 350
2-Nitroaniline (o-Nitroaniline)	580	160,000	< 2,200	< 2,200	< 2,200	< 1,800
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	< 420	< 420	< 420	< 350
2-Picoline	--	--	< 420	< 420	< 420	< 350
3,3'-Dichlorobenzidine	32,000	180,000	< 850	< 850	< 840	< 710
3,3'-Dimethylbenzidine	1,500	8,600	< 2,200	< 2,200	< 2,200	< 1,800
3-Methylcholanthrene	--	--	< 420	< 420	< 420	< 350
3-Nitroaniline (m-Nitroaniline)	580	160,000	< 2,200	< 2,200	< 2,200	< 1,800
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,200	< 2,200	< 2,200	< 1,800
4-Aminobiphenyl	12	3,800	< 420	< 420	< 420	< 350
4-Bromophenylphenyl ether	--	--	< 420	< 420	< 420	< 350
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	< 420	< 420	< 420	< 350
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	< 850	< 850	< 840	< 710
4-Chlorophenylphenyl ether	--	--	< 420	< 420	< 420	< 350
4-Nitroaniline (p-Nitroaniline)	580	160,000	< 2,200	< 2,200	< 2,200	< 1,800
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	< 2,200	< 2,200	< 2,200	< 1,800
4-Nitroquinoline-1-oxide	--	--	< 4,200	< 4,200	< 4,200	< 3,500
5-Nitro-o-toluidine	--	--	< 420	< 420	< 420	< 350
7,12-Dimethylbenz(a)anthracene	--	--	< 420	< 420	< 420	< 350
Acenaphthene	4,700,000	170,000,000	< 420	< 420	89J	< 350
Acenaphthylene	6,900,000	170,000,000	< 420	< 420	< 420	< 350
Acetophenone	1,000,000	10,000,000	< 420	< 420	< 420	< 350
alpha,alpha-Dimethylphenethylamine	--	--	< 86,000	< 86,000	< 85,000	< 72,000
Aniline	580	53,000	< 420	< 420	< 420	< 350
Anthracene	350,000	190,000,000	< 420	< 420	< 420	< 350
Aramite, Total	--	--	< 420	< 420	< 420	< 350
Benzo(a)anthracene	320,000	110,000	54J	< 420	47J	< 350
Benzo(a)pyrene	46,000	11,000	76J	< 420	< 420	< 350
Benzo(b)fluoranthene	170,000	110,000	100	< 420	< 420	< 350
Benzo(g,h,i)perylene	180,000	170,000,000	63J	< 420	50J	< 350
Benzo(k)fluoranthene	610,000	1,100,000	< 420	< 420	35J	< 350
Benzyl alcohol	3,100,000	10,000,000	< 420	< 420	< 420	< 350
bis(2-Chloroethoxy)methane	--	--	< 420	< 420	< 420	< 350

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[(b)] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	UP-1 (0-2) 12/4/2003	UP-2 (0-2) 12/4/2003	UP-4 (0-2) 12/4/2003	UP-5 (0-2) 12/11/2003
Semivolatile Organic Compounds cont'd. (ug/kg)						
bis(2-Chloroethyl)ether	55	5,000	< 420	< 420	< 420	< 350
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	< 420	59J	< 420	160J
Butylbenzylphthalate	10,000,000	10,000,000	< 420	< 420	< 420	< 350
Chrysene	230,000	11,000,000	82B	< 420	70B	< 350
Cresol (ortho)	510,000	10,000,000	< 420	< 420	< 420	< 350
Cresol, m & p	51,000	14,000,000	< 420	< 420	< 420	< 350
Diallate, Total	1,000	93,000	< 420	< 420	< 420	< 350
Dibenzo(a,h)anthracene	160,000	11,000	< 420	< 420	< 420	< 350
Dibenzofuran	--	--	< 420	< 420	< 420	< 350
Diethylphthalate	500,000	10,000,000	< 420	< 420	< 420	< 350
Dimethoate	2,000	560,000	< 420	< 420	< 420	< 350
Dimethylphthalate	--	--	< 420	< 420	< 420	< 350
Di-n-butylphthalate	4,100,000	10,000,000	< 420	< 420	< 420	< 350
Di-n-octylphthalate	10,000,000	10,000,000	< 420	< 420	< 420	< 350
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	< 420	< 420	< 420	< 350
Disulfoton	78	7,600	< 420	< 420	< 420	< 350
Ethyl methanesulfonate	--	--	< 420	< 420	< 420	< 350
Ethyl parathion (Parathion)	360,000	10,000,000	< 420	< 420	< 420	< 350
Famphur	--	--	< 420	< 420	< 420	< 350
Fluoranthene	3,200,000	110,000,000	74J	< 420	120J	< 350
Fluorene	3,800,000	110,000,000	< 420	< 420	110J	< 350
Hexachlorobenzene	960	50,000	< 420	< 420	< 420	< 350
Hexachlorobutadiene	1,200	560,000	< 420	< 420	< 420	< 350
Hexachlorocyclopentadiene	91,000	10,000,000	< 420	< 420	< 420	< 350
Hexachloroethane	560	2,800,000	< 420	< 420	< 420	< 350
Hexachlorophene	--	--	< 220,000	< 220,000	< 220,000	< 180,000
Hexachloropropene	--	--	< 420	< 420	< 420	< 350
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	43J	< 420	42J	< 350
Isophorone	10,000	10,000,000	< 420	< 420	< 420	< 350
Isosafrole	--	--	< 420	< 420	< 420	< 350
m-Dinitrobenzene	100	280,000	< 420	< 420	< 420	< 350
Methapyrilene	--	--	< 86,000	< 86,000	< 85,000	< 72,000
Methyl methanesulfonate	2,600	800,000	< 420	< 420	< 420	< 350
Methyl parathion	420	48,000	< 420	< 420	< 420	< 350
Naphthalene	25,000	56,000,000	320J	< 420	5,500	300J
Nitrobenzene	5,100	1,400,000	< 420	< 420	< 420	< 350
N-Nitrosodiethylamine	1.3	38	< 420	< 420	< 420	< 350
N-Nitrosodimethylamine	1.3	120	< 420	< 420	< 420	< 350
N-Nitrosodi-n-butylamine	14	15,000	< 420	< 420	< 420	< 350
n-Nitrosodi-n-propylamine	37	11,000	< 420	< 420	< 420	< 350
N-Nitrosodiphenylamine	83,000	16,000,000	< 420	< 420	< 420	< 350
N-Nitrosomethylethylamine	--	--	< 420	< 420	< 420	< 350
N-Nitrosomorpholine	--	--	< 420	< 420	< 420	< 350
N-Nitrosopiperidine	--	--	< 420	< 420	< 420	< 350
N-Nitrosopyrrolidine	--	--	< 420	< 420	< 420	< 350
O,O,O-Triethyl phosphorothioate	--	--	< 420	< 420	< 420	< 350
o-Toluidine	1,200	330,000	< 420	< 420	< 420	< 350
p-(Dimethylamino)azobenzene	150	17,000	< 420	< 420	< 420	< 350
Pentachlorobenzene	660,000	2,200,000	< 420	< 420	< 420	< 350
Pentachloronitrobenzene	20,000	310,000	< 420	< 420	< 420	< 350
Pentachlorophenol	5,000	660,000	< 2,200	< 2,200	< 2,200	< 1,800
Phenacetin	120,000	36,000,000	< 420	< 420	< 420	< 350
Phenanthrene	10,000,000	190,000,000	< 420	< 420	< 420	< 350
Phenol	400,000	190,000,000	< 420	< 420	< 420	< 350
Phorate	880	37,000	< 420	< 420	< 420	< 350
Pronamide	5,000	190,000,000	< 420	< 420	< 420	< 350
Pyrene	2,200,000	84,000,000	67J	< 420	150J	< 350
Pyridine	2,000	190,000	< 420	< 420	< 420	< 350
Safrole	--	--	< 420	< 420	< 420	< 350
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	< 420	< 420	< 420	< 350
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 420	< 420	< 420	< 350

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	UP-1 (0-2) 12/4/2003	UP-2 (0-2) 12/4/2003	UP-4 (0-2) 12/4/2003	UP-5 (0-2) 12/11/2003
Inorganics (mg/kg) [a]						
Antimony	27	1,100	< 2.3	< 2.4	< 2.5	0.8L
Arsenic	150	53	8.7L	9.5L	8.4L	3K
Barium	8,200	190,000	130	580	180	210K
Beryllium	320	5,600	1.1	1.9	1.8	4.4K
Cadmium	38	210	0.12B	< 0.59	< 0.61	0.24J
Chromium	190,000	190,000	38L	33K	27K	21
Cobalt	200	56,000	7.3K	28K	15K	2.4
Copper	36,000	100,000	20	32	31	18
Lead	450	1,000	11L	33	32L	7.1L
Mercury	10	840	0.035K	0.17	0.038	0.27L
Nickel	650	56,000	21	36	29	11
Selenium	26	14,000	< 1.2R	< 5.9L	< 1.2	0.95L
Silver	84	14,000	< 1.2	< 1.2	< 1.2	< 1
Thallium	14	200	< 1.2L	< 5.9	< 1.2L	< 1
Tin	6,100	190,000	2.4B	2B	2.6B	2.5B
Vanadium	72,000	20,000	39	30	30	11B
Zinc	12,000	190,000	67J	100J	93J	42

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	V-1 (0-2) 12/5/2003	V-3 (0-2) 12/5/2003
Volatile Organic Compounds (ug/kg) [a]				
1,1,1,2-Tetrachloroethane	18,000	3,100,000	<6.3/<5.8 [k]	< 5.6
1,1,1-Trichloroethane	20,000	10,000,000	<6.3/<5.8	< 5.6
1,1,2,2-Tetrachloroethane	30	28,000	<6.3/<5.8	< 5.6
1,1,2-Trichloroethane	500	100,000	<6.3/<5.8	< 5.6
1,1-Dichloroethane	11,000	1,000,000	<6.3/<5.8	< 5.6
1,1-Dichloroethene	700	33,000	<6.3/<5.8	< 5.6
1,2,3-Trichloropropane	400,000	820	<6.3/<5.8	< 5.6
1,2,4-Trimethylbenzene	20,000	320,000	2.2J/1.8J	11
1,2-Dibromo-3-chloropropane	20	11,000	<13/<11	< 11
1,2-Dibromoethane (EDB)	5	930	<6.3/<5.8	< 5.6
1,2-Dichloroethane	500	63,000	<6.3/<5.8	< 5.6
1,2-Dichloropropane	500	160,000	<6.3/<5.8	< 5.6
1,3,5-Trimethylbenzene	6,200	320,000	<6.3/<5.8	8.7
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	<32/<28	< 28
2-Hexanone	--[c]	--	<32/<28	< 28
3-Chloropropene (Allylchloride)	4,100	370,000	<6.3/<5.8	< 5.6
4-Methyl-2-pentanone (MIBK)	410,000	4,300,000	<32/<28	< 28
Acetone	1,000,000	10,000,000	51J/39J	< 56
Acetonitrile	35,000	3,200,000	<250/<220	< 220
Acrolein (Propenal)	12	1,100	<130/<110	< 110
Acrylonitrile	270	24,000	<130/<110	< 110
Benzene	500	210,000	<6.3/<5.8	< 5.6
Bromodichloromethane	10,000	45,000	<6.3/<5.8	< 5.6
Bromoform	10,000	1,500,000	<6.3/<5.8	< 5.6
Bromomethane (Methyl Bromide)	1,000	270,000	<6.3/<5.8	< 5.6
Carbon disulfide	410,000	10,000,000	<6.3/<5.8	< 5.6
Carbon tetrachloride	500	110,000	<6.3/<5.8	< 5.6
Chlorobenzene	10,000	10,000,000	<6.3/<5.8	1.5J
Chloroethane	90,000	10,000,000	<6.3/<5.8	< 5.6
Chloroform	10,000	17,000	<6.3/<5.8	< 5.6
Chloromethane (Methyl Chloride)	300	920,000	<6.3/<5.8	< 5.6
Chloroprene	4,100	370,000	<6.3/<5.8	< 5.6
cis-1,2-Dichloroethene	7,000	1,900,000	<6.3/<5.8	< 5.6
cis-1,3-Dichloropropene	2,600	410,000	<6.3/<5.8	< 5.6
Dibromochloromethane	--	--	<6.3/<5.8	< 5.6
Dibromomethane (Methylene bromide)	20,000	1,900,000	<6.3/<5.8	< 5.6
Dichlorodifluoromethane	100,000	10,000,000	<6.3/<5.8	< 5.6
Ethyl methacrylate	180,000	190,000,000	<6.3/<5.8	< 5.6
Ethylbenzene	70,000	10,000,000	<6.3/<5.8	2.1J
Iodomethane (Methyl iodide)	--	--	<6.3/<5.8	< 5.6
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	<250/<220	< 220
Methacrylonitrile	410	37,000	<130/<110	< 110
Methyl methacrylate	410,000	10,000,000	<6.3/<5.8	< 5.6
Methylene chloride (Dichloromethane)	500	920,000	<6.3/<5.8	< 5.6
Pentachloroethane	--	--	<32/<28	< 28
Propionitrile	--	--	<130/<110	< 110
Styrene	24,000	10,000,000	<6.3/<5.8	< 5.6
Tetrachloroethene	500	1,500,000	<6.3/<5.8	< 5.6
Toluene	100,000	10,000,000	<6.3/<5.8	2.2J
trans-1,2-Dichloroethene	10,000	3,700,000	<6.3/<5.8	< 5.6
trans-1,3-Dichloropropene	2,600	410,000	<6.3/<5.8	< 5.6
trans-1,4-Dichloro-2-butene	7	190,000,000	<13/<11	< 11
Trichloroethene	500	970,000	<6.3/<5.8	5.3J
Trichlorofluoromethane	--	--	<6.3/<5.8	< 5.6
Vinyl acetate	120,000	10,000,000	<13/<11	< 11
Vinyl chloride	200	53,000	<6.3/<5.8	< 5.6
Xylenes, Total	1,000,000	10,000,000	<13/<11	6J

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[(b)] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	V-1 (0-2) 12/5/2003	V-3 (0-2) 12/5/2003
Semivolatile Organic Compounds (ug/kg)				
1,2,4,5-Tetrachlorobenzene	14,000	840,000	<430/<440	< 2,000
1,2,4-Trichlorobenzene	27,000	10,000,000	<430/<440	< 2,000
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	<430/<440	< 2,000
1,3,5-Trinitrobenzene	--	--	<430/<440	< 2,000
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	<430/<440	< 2,000
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	3,300,000	<430/<440	< 2,000
1,4-Dioxane	2,400	210,000	<430/<440	< 2,000
1,4-Naphthoquinone	--	--	<430/<440	< 2,000
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	<2,200/<2,300	< 10,000
1-Naphthylamine	1,100	44,000	<430/<440	< 2,000
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	160,000	<430/<440	< 2,000
2,3,4,6-Tetrachlorophenol	950,000	84,000,000	<430/<440	< 2,000
2,4,5-Trichlorophenol	6,100,000	190,000,000	<430/<440	< 2,000
2,4,6-Trichlorophenol	8,900	840,000	<430/<440	< 2,000
2,4-Dichlorophenol	2,000	8,400,000	<430/<440	< 2,000
2,4-Dimethylphenol	200,000	10,000,000	<430/<440	< 2,000
2,4-Dinitrophenol	4,100	5,600,000	<2,200/<2,300	< 10,000
2,4-Dinitrotoluene	840	260,000	<430/<440	< 2,000
2,6-Dichlorophenol	--	--	<430/<440	< 2,000
2,6-Dinitrotoluene	10,000	2,800,000	<430/<440	< 2,000
2-Acetylaminofluorene	280	21,000	<430/<440	< 2,000
2-Chloronaphthalene	18,000,000	190,000,000	<430/<440	< 2,000
2-Chlorophenol	4,400	920,000	<430/<440	< 2,000
2-Methylnaphthalene	8,000,000	10,000,000	<430/<440	270J
2-Naphthylamine	140	44,000	<430/<440	< 2,000
2-Nitroaniline (o-Nitroaniline)	580	160,000	<2,200/<2,300	< 10,000
2-Nitrophenol (o-Nitrophenol)	82,000	22,000,000	<430/<440	< 2,000
2-Picoline	--	--	<430/<440	< 2,000
3,3'-Dichlorobenzidine	32,000	180,000	<870/<880	< 4,000
3,3'-Dimethylbenzidine	1,500	8,600	<2,200/<2,300	< 10,000
3-Methylcholanthrene	--	--	<430/<440	< 2,000
3-Nitroaniline (m-Nitroaniline)	580	160,000	<2,200/<2,300	< 10,000
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	<2,200/<2,300	< 10,000
4-Aminobiphenyl	12	3,800	<430/<440	< 2,000
4-Bromophenylphenyl ether	--	--	<430/<440	< 2,000
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	14,000,000	<430/<440	< 2,000
4-Chloroaniline (p-Chloroaniline)	52,000	11,000,000	<870/<880	< 4,000
4-Chlorophenylphenyl ether	--	--	<430/<440	< 2,000
4-Nitroaniline (p-Nitroaniline)	580	160,000	<2,200/<2,300	< 10,000
4-Nitrophenol (p-Nitrophenol)	6,000	22,000,000	<2,200/<2,300	< 10,000
4-Nitroquinoline-1-oxide	--	--	<4,300/<4,400	< 20,000
5-Nitro-o-toluidine	--	--	<430/<440	< 2,000
7,12-Dimethylbenz(a)anthracene	--	--	<430/<440	< 2,000
Acenaphthene	4,700,000	170,000,000	<430/<440	< 2,000
Acenaphthylene	6,900,000	170,000,000	<430/<440	< 2,000
Acetophenone	1,000,000	10,000,000	<430/<440	< 2,000
alpha,alpha-Dimethylphenethylamine	--	--	<88,000/<89,000	< 400,000
Aniline	580	53,000	<430/<440	< 2,000
Anthracene	350,000	190,000,000	<430/<440	< 2,000
Aramite, Total	--	--	<430/<440	< 2,000
Benzo(a)anthracene	320,000	110,000	<430/<440	< 2,000
Benzo(a)pyrene	46,000	11,000	<430/<440	< 2,000
Benzo(b)fluoranthene	170,000	110,000	<430/<440	< 2,000
Benzo(g,h,i)perylene	180,000	170,000,000	57J/48J	210J
Benzo(k)fluoranthene	610,000	1,100,000	31J/47J	< 2,000
Benzyl alcohol	3,100,000	10,000,000	<430/<440	< 2,000
bis(2-Chloroethoxy)methane	--	--	<430/<440	< 2,000

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	Sample ID: / Sample Date: PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	V-1 (0-2) 12/5/2003	V-3 (0-2) 12/5/2003
Semivolatile Organic Compounds cont'd. (ug/kg)				
bis(2-Chloroethyl)ether	55	5,000	<430/<440	< 2,000
bis(2-Ethylhexyl)phthalate	130,000	5,700,000	<430/<440	< 2,000
Butylbenzylphthalate	10,000,000	10,000,000	<430/<440	< 2,000
Chrysene	230,000	11,000,000	44B/52B	< 2,000
Cresol (ortho)	510,000	10,000,000	<430/<440	< 2,000
Cresol, m & p	51,000	14,000,000	<430/<440	< 2,000
Diallate, Total	1,000	93,000	<430/<440	< 2,000
Dibenzo(a,h)anthracene	160,000	11,000	48J/<440	< 2,000
Dibenzofuran	--	--	<430/<440	< 2,000
Diethylphthalate	500,000	10,000,000	<430/<440	< 2,000
Dimethoate	2,000	560,000	<430/<440	< 2,000
Dimethylphthalate	--	--	<430/<440	< 2,000
Di-n-butylphthalate	4,100,000	10,000,000	<430/<440	< 2,000
Di-n-octylphthalate	10,000,000	10,000,000	<430/<440	< 2,000
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	2,800,000	<430/<440	< 2,000
Disulfoton	78	7,600	<430/<440	< 2,000
Ethyl methanesulfonate	--	--	<430/<440	< 2,000
Ethyl parathion (Parathion)	360,000	10,000,000	<430/<440	< 2,000
Famphur	--	--	<430/<440	< 2,000
Fluoranthene	3,200,000	110,000,000	70J/86J	< 2,000
Fluorene	3,800,000	110,000,000	<430/<440	< 2,000
Hexachlorobenzene	960	50,000	<430/<440	< 2,000
Hexachlorobutadiene	1,200	560,000	<430/<440	< 2,000
Hexachlorocyclopentadiene	91,000	10,000,000	<430/<440	< 2,000
Hexachloroethane	560	2,800,000	<430/<440	< 2,000
Hexachlorophene	--	--	<220,000/<230,000	< 1,000,000
Hexachloropropene	--	--	<430/<440	< 2,000
Indeno(1,2,3-cd)pyrene	28,000,000	110,000	48J/39J	< 2,000
Isophorone	10,000	10,000,000	<430/<440	< 2,000
Isosafrole	--	--	<430/<440	< 2,000
m-Dinitrobenzene	100	280,000	<430/<440	< 2,000
Methapyrilene	--	--	<88,000/<89,000	< 400,000
Methyl methanesulfonate	2,600	800,000	<430/<440	< 2,000
Methyl parathion	420	48,000	<430/<440	< 2,000
Naphthalene	25,000	56,000,000	<430/<440	3,400
Nitrobenzene	5,100	1,400,000	<430/<440	< 2,000
N-Nitrosodiethylamine	1.3	38	<430/<440	< 2,000
N-Nitrosodimethylamine	1.3	120	<430/<440	< 2,000
N-Nitrosodi-n-butylamine	14	15,000	<430/<440	< 2,000
n-Nitrosodi-n-propylamine	37	11,000	<430/<440	< 2,000
N-Nitrosodiphenylamine	83,000	16,000,000	<430/<440	< 2,000
N-Nitrosomethylethylamine	--	--	<430/<440	< 2,000
N-Nitrosomorpholine	--	--	<430/<440	< 2,000
N-Nitrosopiperidine	--	--	<430/<440	< 2,000
N-Nitrosopyrrolidine	--	--	<430/<440	< 2,000
O,O,O-Triethyl phosphorothioate	--	--	<430/<440	< 2,000
o-Toluidine	1,200	330,000	<430/<440	< 2,000
p-(Dimethylamino)azobenzene	150	17,000	<430/<440	< 2,000
Pentachlorobenzene	660,000	2,200,000	<430/<440	< 2,000
Pentachloronitrobenzene	20,000	310,000	<430/<440	< 2,000
Pentachlorophenol	5,000	660,000	<2,200/<2,300	< 10,000
Phenacetin	120,000	36,000,000	<430/<440	< 2,000
Phenanthrene	10,000,000	190,000,000	70J/46J	< 2,000
Phenol	400,000	190,000,000	<430/<440	< 2,000
Phorate	880	37,000	<430/<440	< 2,000
Pronamide	5,000	190,000,000	<430/<440	< 2,000
Pyrene	2,200,000	84,000,000	59J/72J	< 2,000
Pyridine	2,000	190,000	<430/<440	< 2,000
Safrole	--	--	<430/<440	< 2,000
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	92,000	<430/<440	< 2,000
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	<430/<440	< 2,000

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Soil-to-Groundwater Pathway Used Aquifers, TDS<2,500 Non-Residential	PADEP Act 2 MSCs Direct Contact, Non-Residential 0 - 2 feet	V-1 (0-2) 12/5/2003	V-3 (0-2) 12/5/2003
Inorganics (mg/kg) [a]				
Antimony	27	1,100	1.1J/0.86J	1.5J
Arsenic	150	53	12L/11L	5.6L
Barium	8,200	190,000	140/140	970
Beryllium	320	5,600	1.5/1.2	2.6
Cadmium	38	210	<0.61/	0.44B
Chromium	190,000	190,000	25K/22K	26K
Cobalt	200	56,000	14K/13K	11K
Copper	36,000	100,000	27/21	85
Lead	450	1,000	120L/78L	360
Mercury	10	840	0.17/0.081	0.45
Nickel	650	56,000	19/18	18
Selenium	26	14,000	<1.2R/<1.2R	< 2.2
Silver	84	14,000	<1.2/<1.2	< 1.1
Thallium	14	200	<1.2L/<1.2L	< 2.2L
Tin	6,100	190,000	4B/3.7B	11
Vanadium	72,000	20,000	34/36	12
Zinc	12,000	190,000	98/91	120

CUMMINGS RITER

TABLE 5
SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

NOTES:

a. "ug/kg" is micrograms per kilogram or parts per billion (ppb). "mg/kg" is milligrams per kilogram or parts per million (ppm).
b. PADEP statewide health, medium specific concentrations (MSCs) for regulated substances in soil (Title 25, PA Code Chapter 250).
c. "--" indicates an MSC does not exist for this compound.
d. "<x" indicates the result is less than the method detection limit (MDL).
e. "J" indicates the value is estimated.
f. Values shown in bold and shaded indicate an exceedance of the direct soil-to-groundwater MSCs. There are no direct-contact MSC exceedances for surface soils.
g. "K" indicates the reported value may be biased high. Actual value is expected to be lower.
h. "L" indicates the reported value is biased low. Actual value is expected to be higher.
i. "B" indicates not detected substantially above the level reported in the laboratory or field blanks.
j. "R" indicates the analyte may or may not be present in the sample.
k. "x/x" indicates a duplicate sample was collected at this location.

TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg)	SB-F1/MW-F1A	SB-F1/MW-F1B	SB-F2/MW-F2A	SB-F2/MW-F2B	SB-F3/MW-F3A	SB-F3/ MW-F3B	SB-F4/MWD-F1A
		TDS <2,500 mg/L	(3 - 4 ft)[d] 10/16/2000	(11 - 12 ft) 10/16/2000	(2.5 - 3.5 ft) 10/19/2000	(5 - 6 ft) 10/19/2000	(3 - 4 ft) 10/24/2000	(13 - 14 ft) 10/24/2000	(6 - 7 ft) 10/23/2000
Groundwater Depth (feet)[a]			12	12	8	8	16	16	30
Inorganics (mg/kg)[e]									
Antimony	190,000	27	0.62 J[h]	0.68 J	< 1.4 UJ[k]	0.48 J	0.62 J	0.51 J	0.79 J
Arsenic	190,000	150	8.9	9.8	7.0	8.3	2.4	8.2	8.7
Barium	190,000	8,200	117 J	87.5 J	1,180	476	291	120	138
Beryllium	190,000	320	0.75	0.81	1.5	1.0	6.3	0.83	0.88
Cadmium	190,000	38	0.14 B[i]	0.18 B	< 0.7	0.12 B	0.15 B	0.28 B	0.46 B
Chromium	190,000 [f]	190[f]	13.8	18.2	54.6	53.1	18.2	14.9	183
Cobalt	190,000	200	17.6	12.4	9.4	10	3.2 B	11.8	14.3
Copper	190,000	36,000	20.3	20.7	10.4	11.6	9.2	14.5	20.8
Lead	190,000	450	15.8	15.6	5.5	10.7	8.6	13.1	20.1
Mercury	190,000	10	0.039 B	0.028 B	< 0.14 R	< 0.13 R	0.096 J	0.034 J	0.051 J
Nickel	190,000	650	23.6	19.7	16.0	17.0	6.1	17.6	19.4
Selenium	190,000	26	< 0.59[j]	0.39 B	3.3 B	1.5 B	3.0	0.52 B	< 14.5
Silver	190,000	84	< 0.59	< 0.62	1.1	0.51 B	0.53 B	< 0.6	1.5
Thallium	190,000	14	< 1.2	1.1 B	< 13.9	< 6.4	< 5.6	< 2.4	< 29.1
Tin	190,000	6,100	5.1 B	< 12.4	< 13.9	< 12.9	< 11.2	< 12.1	< 23.3
Vanadium	190,000	72,000	19.7	25.7	8.8	13.3	11.8	20.3	85.9
Zinc	190,000	12,000	66.4	53.8	28.8	41.6	33 J	54.5 J	74.0 J
Volatile Organics (mg/kg)									
Acetone	10,000	1,000	0.0038 J	0.0030 J	1.4 J,B	< 0.97	< 0.66	< 0.02	< 0.0039
Benzene	240	0.5	< 0.0068	< 0.0061	< 0.42	< 0.35	0.47 J	0.0014 J	< 0.0056
1,1-Dichloroethane	1,200	11	< 0.0068	< 0.0061	< 0.42	< 0.35	< 1.4	< 0.005	< 0.0056
cis-1,2-Dichloroethene	2,100	7	< 0.0034	< 0.0030	< 0.21	< 0.17	< 0.69	< 0.0025	< 0.0028
Ethylbenzene	10,000	70	< 0.0068	< 0.0061	3.5	0.3 J	48	0.017	< 0.0056
Tetrachloroethene	3,300	0.50	< 0.0068	< 0.0061	< 0.42	< 0.35	< 1.4	< 0.005	< 0.0056
Toluene	10,000	100	< 0.0068	< 0.0061	0.51	< 0.35	33	0.0063	< 0.0056
o-Xylene	10,000[g]	1,000[g]	< 0.0034	< 0.0030	13	0.98	45	0.036	< 0.0028
m-Xylene & p-Xylene	10,000[g]	1,000[g]	< 0.0068	< 0.0061	7.6	0.59	70	0.042	< 0.0056

TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F1/MW-F1A (3 - 4 ft)[d] 10/16/2000	SB-F1/MW-F1B (11 - 12 ft) 10/16/2000	SB-F2/MW-F2A (2.5 - 3.5 ft) 10/19/2000	SB-F2/MW-F2B (5 - 6 ft) 10/19/2000	SB-F3/MW-F3A (3 - 4 ft) 10/24/2000	SB-F3/MW-F3B (13 - 14 ft) 10/24/2000	SB-F4/MWD-F1A (6 - 7 ft) 10/23/2000
Groundwater Depth (feet)[a]			12	12	8	8	16	16	30
Semivolatile Organics (mg/kg)									
Acenaphthene	190,000	4,700	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.024 J
Acenaphthylene	190,000	6,900	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.1 J
Anthracene	190,000	350	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.14 J
Benzo (a) anthracene	190,000	320	< 0.39	0.033 J	< 9.2	< 1.7	< 7.4	< 0.4	0.69
Benzo (a) pyrene	190,000	46	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.65
Benzo (b) fluoranthene	190,000	170	< 0.39	0.073 J	< 9.2	< 1.7	< 7.4	< 0.4	0.65
Benzo (k) fluoranthene	190,000	610	< 0.39	0.048 J	< 9.2	< 1.7	< 7.4	< 0.4	0.64
Benzo (ghi) perylene	190,000	180	< 0.39	0.025 J	< 9.2	< 1.7	< 7.4	< 0.4	0.16 J
bis(2-Ethylhexyl) phthalate	10,000	130	0.12 J	0.29 J	0.64 J	0.55 J	< 7.4	0.064 J	0.24 J
Butyl benzyl phthalate	10,000	10,000	< 0.39	< 0.048	< 9.2	< 1.7	< 7.4	< 0.4	< 0.38
Chrysene	190,000	230	< 0.39	0.048 J	< 9.2	< 1.7	< 7.4	< 0.4	0.66
Dibenz(a,h)anthracene	190,000	160	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	< 0.38
Dibenzofuran	100[m]	0.5[m]	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.037 J
Fluoranthene	190,000	3,200	< 0.39	0.067 J	< 9.2	< 1.7	< 7.4	< 0.4	1.4
Fluorene	190,000	3,800	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.029 J
Indeno(1,2,3-cd) pyrene	190,000	28,000	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	0.2 J
2-Methylnaphthalene	10,000	8,000	< 0.39	< 0.41	4.3 J	0.24 J	17/18	< 0.4	0.034 J
2-Methylphenol	10,000	510	< 0.39	< 0.41	< 9.2	< 1.7	< 7.4	< 0.4	< 0.38
Naphthalene	190,000	25	< 0.39	< 0.41	55[o]	2.4	91 E[n]/98	0.13 J	0.073 J
Phenanthrene	190,000	10,000	< 0.39	0.027 J	< 9.2	< 1.7	< 7.4	< 0.4	0.4
Phenol	190,000	400	< 0.39	< 0.41	1.5 J	< 1.7	< 7.4	< 0.4	< 0.38
Pyrene	190,000	2,200	< 0.39	0.042 J	< 9.2	< 1.7	< 7.4	< 0.4	0.67
Polychlorinated Biphenyls (ug/kg)[l]	[n]	[n]	*None Detected*						
Other (mg/kg)									
Hydrocarbons as GRO			< 0.12	< 0.12	1,900	20	1,600	8.7	< 0.12
Hydrocarbons as DRO			< 12	< 12	3,500 J	160	1,400 J	65	120
pH (standard units)			5.0	5.6	12.9	12	8.8	5.6	9.5
Total Organic Carbon			1,130	1,510	5,910	2,820	8,810	1,310	4,880
TPH			393	518	4,790	2,180	3,070	< 39.9	127

CUMMINGS RITER

TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F5/MW-F4B (14 - 15 ft)[d] 10/18/2000	SB-F6/MW-F5A (6 - 7 ft) 10/20/2000	SB-F7A (3 - 4 ft) 10/17/2000	SB-F9A (3 - 4 ft)[d] 10/17/2000	SB-F10B (3 - 4 ft) 10/18/00	SB-F11B (10.5 - 11.5 ft) 10/18/00	SB-F12B (12 - 13 ft) 10/18/00
Groundwater Depth (feet)[a]			16	17	19	20	8	12	14
Inorganics (mg/kg)									
Antimony	190,000	27	0.54 J	0.49 B	0.6 J	0.39 J	0.52 J	0.67 J	0.58 J
Arsenic	190,000	150	8.1	11.2	10.3	9.5	11.2	10.4	4.2
Barium	190,000	8,200	97.1	142 J	76.5 J	61.6 J	161 J	79.9 J	93.8 J
Beryllium	190,000	320	0.95	0.94	0.92	0.55 B	1.2	0.65	0.75
Cadmium	190,000	38	< 0.59 R	< 0.6 R	< 0.62 R	< 0.59 R	0.2 J	< 0.61 R	0.14 J
Chromium	190,000[f]	190[f]	18.8	16.1	15.1	15.0	22.4	11.1	17.7
Cobalt	190,000	200	10.8	14.0	30.0	8.5	18.0	11.5	15.9
Copper	190,000	36,000	16.1	23.8	22.5	15.1	25.2	18.4	23.4
Lead	190,000	450	13.0	16.8	22.2	13.9	17.1	11.3	13.7
Mercury	190,000	10	0.033 B	0.035 B	0.034 B	< 0.12	0.06 B	0.029 B	< 0.12
Nickel	190,000	650	16.8	21.7	20.6	14.3	33.3	22.2	24.0
Selenium	190,000	26	< 0.59	< 0.6	< 1.2	< 0.59	0.77 B	< 0.61	< 0.62
Silver	190,000	84	< 0.59	< 0.6	< 0.62	< 0.59	0.15 B	< 0.61	< 0.62
Thallium	190,000	14	< 1.2	0.74 B	< 2.5	1.1 B	< 2.5	< 1.2	< 1.2
Tin	190,000	6,100	< 11.7	< 12.1	< 12.4	3.6 B	< 12.4	< 12.2	2.9 B
Vanadium	190,000	72,000	19	23.3	22.7	21.6	29.1	21.0	21.1
Zinc	190,000	12,000	50.0	76.5	68.5	49.4	83.9	64.1	75.8
Volatile Organics (mg/kg)									
Acetone	10,000	1,000	< 0.65	< 0.023	< 0.023	0.0057 J	< 0.0048	< 0.0033	< 0.0026
Benzene	240	0.5	< 0.59	< 0.0057	< 0.0057	< 0.0049	< 0.0074	< 0.0058	< 0.0055
1,1-Dichloroethane	1,200	11	< 0.59	< 0.0057	< 0.0057	< 0.0049	< 0.0074	< 0.0058	< 0.0055
cis-1,2-Dichloroethene	2,100	7	< 0.30	< 0.0057	< 0.0029	< 0.0024	< 0.0037	< 0.0029	< 0.0027
Ethylbenzene	10,000	70	1.8	< 0.0057	< 0.0057	< 0.0049	< 0.0074	< 0.0058	< 0.0055
Tetrachloroethene	3,300	0.50	< 0.59	< 0.0057	< 0.0057	< 0.0049	< 0.0074	< 0.0058	< 0.0055
Toluene	10,000	100	0.63	< 0.0057	< 0.0057	< 0.0049	< 0.0074	< 0.0058	< 0.0055
o-Xylene	10,000[g]	1,000[g]	4.9	< 0.0029	< 0.0029	< 0.0024	< 0.0037	< 0.0029	< 0.0027
m-Xylene & p-Xylene	10,000[g]	1,000[g]	6.0	< 0.0057	< 0.0057	< 0.0049	< 0.0074	< 0.0058	< 0.0055

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TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[h] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F5/MW-F4B (14 - 15 ft) 10/18/2000	SB-F6/MW-F5A (6 - 7 ft) 10/20/2000	SB-F7A (3 - 4 ft) 10/17/2000	SB-F9A (3 - 4 ft)[d] 10/17/2000	SB-F10B (3 - 4 ft) 10/18/00	SB-F11B (10.5 - 11.5 ft) 10/18/00	SB-F12B (12 - 13 ft) 10/18/00
Groundwater Depth (feet)[g]			16	17	19	20	8	12	14
Semivolatile Organics (mg/kg)									
Acenaphthene	190,000	4,700	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Acenaphthylene	190,000	6,900	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Anthracene	190,000	350	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Benzo (a) anthracene	190,000	320	< 0.39	< 0.4	< 0.41	< 0.39	0.032 J	< 0.4	< 0.41
Benzo (a) pyrene	190,000	46	< 0.39	< 0.4	< 0.41	< 0.39	0.03 J	< 0.4	< 0.41
Benzo (b) fluoranthene	190,000	170	< 0.39	< 0.4	< 0.41	< 0.39	0.04 J	< 0.4	< 0.41
Benzo (k) fluoranthene	190,000	610	< 0.39	< 0.4	< 0.41	< 0.39	0.035 J	< 0.4	< 0.41
Benzo (ghi) perylene	190,000	180	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
bis(2-Ethylhexyl) phthalate	10,000	130	2.1	0.086 J	0.11	0.19 J	0.83	0.047 J	0.64
Butyl benzyl phthalate	10,000	10,000	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Chrysene	190,000	230	< 0.39	< 0.4	< 0.41	< 0.39	0.037 J	< 0.4	< 0.41
Dibenz(a,h)anthracene	190,000	160	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Dibenzofuran	100[m]	0.5[m]	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Fluoranthene	190,000	3,200	< 0.39	< 0.4	< 0.41	< 0.39	0.083 J	< 0.4	< 0.41
Fluorene	190,000	3,800	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Indeno(1,2,3-cd) pyrene	190,000	28,000	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
2-Methylnaphthalene	10,000	8,000	0.065 J	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
2-Methylphenol	10,000	510	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Naphthalene	190,000	25	2.1	< 0.4	< 0.41	< 0.39	2	< 0.4	< 0.41
Phenanthrene	190,000	10,000	< 0.39	< 0.4	< 0.41	< 0.39	0.035 J	< 0.4	< 0.41
Phenol	190,000	400	< 0.39	< 0.4	< 0.41	< 0.39	< 0.41	< 0.4	< 0.41
Pyrene	190,000	2,200	< 0.39	< 0.4	< 0.41	< 0.39	0.038 J	< 0.4	< 0.41
Polychlorinated Biphenyls (ug/kg)	(n)	(n)	*None Detected*						
Other (mg/kg)									
Hydrocarbons as GRO			48	< 0.12	< 0.12	0.18	28	< 0.12	< 0.12
Hydrocarbons as DRO			39	< 12	< 12	7.0 J	16	< 12	< 12
pH (standard units)			7.3	7.4	5.1	5.8	7.5	7.9	8
Total Organic Carbon			2,490	2,120	424	1,910	4,690	4,130	4,790
TPH			38.8	< 39.9	< 40.8	< 38.6	< 41	< 40.4	< 41

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TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F13A (2.5 - 3.5 ft) 10/23/00	SB-F13B (13 - 14 ft) 10/23/00	SB-F14A (3.5 - 4.5 ft)[d] 10/20/00	SB-F14B (14.5 - 15.5 ft) 10/20/00	SB-F15A (4.5 - 5.5 ft) 10/20/00	SB-F16A (2.5 - 3.5 ft) 10/23/00	SB-F16B (13 - 14 ft) 10/23/00	SB-F18A (4 - 5 ft)[d] 10/19/2000
Groundwater Depth (feet)[a]			15	15	17	17	10.5	15	15	Not Defined
Inorganics (mg/kg)										
Antimony	190,000	27	0.6 J	0.3 J	0.66 J	0.56 B	0.73 B	0.56 J	0.35 J	0.91 J
Arsenic	190,000	150	11.8	9.7	11.0	10.1	8.3	8.9	10.3	9.5
Barium	190,000	8,200	79.1	102	70.3	70.7 J	103 J	96.0	115	142
Beryllium	190,000	320	0.75	0.84	0.77	0.71	0.67	0.76	0.86	1.2
Cadmium	190,000	38	0.12 B	0.2 B	0.093 B	0.13 J	< 0.6 R	0.18 B	0.22 B	0.63
Chromium	190,000[f]	190[f]	20.5	16.6	19.7	13.1	12.8	14.8	15.9	24.4
Cobalt	190,000	200	12.4	15.3	11.9	16.2	8.6	12.2	17.7	21.5
Copper	190,000	36,000	21.5	21.6	22.0	22.0	16.8	19.2	21.3	30.7
Lead	190,000	450	17.4	14.0	14.0	14.2	11.4	13.7	15.7	25.9
Mercury	190,000	10	0.033 J	0.038 J	0.028 J	< 0.12	0.045 B	0.034 J	0.035 J	0.51 J
Nickel	190,000	650	17.2	26.8	19.1	23.3	14.1	20.4	25.1	31.6
Selenium	190,000	26	0.71	0.3	0.60	< 0.60	< 0.6	0.60	0.63	2 B
Silver	190,000	84	< 0.6	< 0.61	< 0.6	< 0.60	< 0.6	< 0.58	< 0.6	0.31 B
Thallium	190,000	14	< 2.4	< 2.4	< 1.2	< 1.2	0.73 B	< 2.3	< 1.2	< 6.0
Tin	190,000	6,100	< 12.1	< 12.2	< 12	< 12.1	< 12.1	< 11.7	< 12.1	< 24.0
Vanadium	190,000	72,000	27.2	23.4	27.0	19.1	19.9	20.2	23.2	26.9
Zinc	190,000	12,000	61.9 J	70.6J J	61.7	67.6	53.6	59.2 J	67.7 J	108
Volatile Organics (mg/kg)										
Acetone	10,000	1,000	< 0.005	< 0.0027	0.0032 J,B	< 0.003	< 0.0029	< 0.02	< 0.0024	< 0.76
Benzene	240	0.5	< 0.0061	< 0.0056	< 0.0048	< 0.0058	< 0.0059	< 0.0051	< 0.0054	< 0.26
1,1-Dichloroethane	1,200	11	< 0.0061	< 0.0056	< 0.0048	< 0.0058	< 0.0059	< 0.0051	< 0.0054	< 0.26
cis-1,2-Dichloroethene	2,100	7	< 0.003	< 0.0028	< 0.0024	< 0.0029	< 0.0059	< 0.0025	< 0.0027	< 0.13
Ethylbenzene	10,000	70	< 0.0061	< 0.0056	< 0.0048	< 0.0058	< 0.0059	< 0.0051	< 0.0054	2.2
Tetrachloroethene	3,300	0.50	< 0.0061	< 0.0056	< 0.0048	< 0.0058	< 0.0059	< 0.0051	< 0.0054	< 0.26
Toluene	10,000	100	< 0.0061	< 0.0056	< 0.0048	< 0.0058	< 0.0059	< 0.0051	< 0.0054	< 0.26
o-Xylene	10,000[g]	1,000[g]	< 0.003	< 0.0056	< 0.0024	< 0.0029	< 0.0029	< 0.0025	< 0.0027	0.16
m-Xylene & p-Xylene	10,000[g]	1,000[g]	< 0.0061	< 0.0028	< 0.0048	< 0.0058	< 0.0059	< 0.0051	< 0.0054	0.11 J

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TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[a] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[b] (mg/kg) TDS <2,500 mg/L	SB-F13A (2.5 - 3.5 ft) 10/23/00	SB-F13B (13 - 14 ft) 10/23/00	SB-F14A (3.5 - 4.5 ft) 10/20/00	SB-F14B (14.5 - 15.5 ft) 10/20/00	SB-F15A (4.5 - 5.5 ft) 10/20/00	SB-F16A (2.5 - 3.5 ft) 10/23/00	SB-F16B (13 - 14 ft) 10/23/00	SB-F18A (4 - 5 ft) 10/19/2000
Groundwater Depth (feet)[a]			15	15	17	17	10.5	15	15	Not Defined
Semivolatile Organics (mg/kg)										
Acenaphthene	190,000	4,700	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.093 J	< 0.4	0.023 J
Acenaphthylene	190,000	6,900	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.39	< 0.4	0.034 J
Anthracene	190,000	350	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.23 J	< 0.4	< 0.4
Benzo (a) anthracene	190,000	320	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.45	< 0.4	< 0.4
Benzo (a) pyrene	190,000	46	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.35 J	< 0.4	< 0.4
Benzo (b) fluoranthene	190,000	170	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.35 J	< 0.4	< 0.4
Benzo (k) fluoranthene	190,000	610	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.34 J	< 0.4	< 0.4
Benzo (ghi) perylene	190,000	180	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.09 J	< 0.4	< 0.4
bis(2-Ethylhexyl) phthalate	10,000	130	0.021	< 0.4	< 0.4	0.033 J	0.12 J	0.052 J	< 0.4	0.24 J
Butyl benzyl phthalate	1,000	10,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.39	< 0.4	< 0.4
Chrysene	190,000	230	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.43	< 0.4	< 0.4
Dibenz(a,h)anthracene	190,000	160	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.021 J	< 0.4	< 0.4
Dibenzofuran	100[m]	0.5[m]	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.049 J	< 0.4	< 0.4
Fluoranthene	190,000	3,200	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	1.3	< 0.4	< 0.4
Fluorene	190,000	3,800	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.078 J	< 0.4	< 0.4
Indeno(1,2,3-cd) pyrene	190,000	28,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.11 J	< 0.4	< 0.4
2-Methylnaphthalene	10,000	8,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.39	< 0.4	0.16 J
2-Methylphenol	10,000	510	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.39	< 0.4	< 0.4
Naphthalene	190,000	25	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.036 J	< 0.4	2.3
Phenanthrene	190,000	10,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.82	< 0.4	0.064 J
Phenol	190,000	400	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.39	< 0.4	< 0.4
Pyrene	190,000	2,200	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.58	< 0.4	< 0.4
Polychlorinated Biphenyls (ug/kg)	(n)	(n)	*None Detected*							
Other (mg/kg)										
Hydrocarbons as GRO			< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	150
Hydrocarbons as DRO			3.5 J	12	< 12	< 12	< 12	3.3 J	< 12	3.1 J
pH (standard units)			8.4	6.1	4.3	5.1	7.5	7.2	6.1	7.2
Total Organic Carbon			1,610	528	2,090	271	2,660	2,140	715	8,790
TPH			< 39.8	< 40.2	< 39.5	< 39.8	< 39.9	< 38.6	< 39.8	128

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TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F18B (6.5 - 7.5 ft) 10/19/2000	SB-F19A (4 - 5 ft) 10/19/2000	SB-F19B (13 - 14 ft) 10/19/2000	SB-F20A (2.5 - 3.5 ft) 10/24/2000	SB-F21A (2.5 - 3.5 ft) 10/17/2000	SB-F22A (2.5 - 3.5 ft) 10/24/2000	SB-F23A (3 - 4 ft)[d] 10/25/2000
Groundwater Depth (feet)[a]			Not Defined	16	16	Not Defined	21	23.5	20
Inorganics (mg/kg)									
Antimony	190,000	27	0.63 J	0.59 J	0.33 J	0.7 J	0.44 J	0.75 J	0.72 J
Arsenic	190,000	150	8.6	12.2	9.2	8.8	10.9	7.0	8.5
Barium	190,000	8,200	106	69.6	140.0	169	68.1 J	427	102
Beryllium	190,000	320	0.93	0.87	0.79	1.1	0.68	3.3	0.84
Cadmium	190,000	38	0.16 B	0.17 B	0.23 B	0.22 B	< 0.56 R	0.53 B	0.088 B
Chromium	190,000[f]	190[f]	20.9	20.5	15.1	21.4	9.6	26.4	13.4 J
Cobalt	190,000	200	17.2	14.4	17.1	24.8	10.4	7.4	14.1
Copper	190,000	36,000	25.2	22.8	19.8	21.6	13.8	14.1	18.5
Lead	190,000	450	20.7	16.6	14.6	25.1	9.7	36.5	21.5
Mercury	190,000	10	0.051 J	0.032 J	< 0.12 R	0.035 J	< 0.11	0.19 J	0.032 B
Nickel	190,000	650	24.8	20.8	24.5	26.4	12.6	12.2	18.3
Selenium	190,000	26	0.54 B	0.78	0.47 B	1.2	< 0.56	2.2 B	0.79
Silver	190,000	84	< 0.6	< 0.60	< 0.60	< 0.61	< 0.56	0.86	< 0.62
Thallium	190,000	14	< 1.2	< 1.2	< 2.4	< 1.2	0.92 B	< 13.1	< 1.2
Tin	190,000	6,100	2.9 B	< 12.1	< 12.1	< 12.1	< 11.3	< 13.1	5.1 B
Vanadium	190,000	72,000	29.1	27.8	21.2	30.0	16.0	15.4	17.3
Zinc	190,000	12,000	74.6	69.2	63.3	91.6 J	41.9	82.2 J	62.0
Volatile Organics (mg/kg)									
Acetone	10,000	1,000	0.68 J,B	< 0.0041	< 0.0039	< 0.02	0.006 J	< 0.4	1.3 B
Benzene	240	0.5	< 0.23	< 0.005	< 0.0054	0.0013 J	< 0.01	< 0.32	< 0.31
1,1-Dichloroethane	1,200	11	< 0.23	< 0.005	< 0.0054	< 0.005	< 0.01	< 0.32	< 0.31
cis-1,2-Dichloroethene	2,100	7	< 0.12	< 0.0025	< 0.0027	< 0.0025	< 0.0051	< 0.16	< 0.31
Ethylbenzene	10,000	70	0.93	< 0.005	< 0.0054	< 0.005	< 0.01	0.85	0.2 J
Tetrachloroethene	3,300	0.50	< 0.23	< 0.005	< 0.0054	< 0.005	< 0.01	< 0.32	< 0.31
Toluene	10,000	100	< 0.23	< 0.005	< 0.0054	< 0.005	0.0032 J	0.22 J	11
o-Xylene	10,000[e]	1,000[e]	0.1 J	< 0.0025	< 0.0027	< 0.0025	< 0.0051	1.5	< 0.15
m-Xylene & p-Xylene	10,000[e]	1,000[e]	0.085 J	< 0.005	< 0.0054	< 0.005	< 0.01	1.7	< 0.31

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TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F18B (6.5 - 7.5 ft) 10/19/2000	SB-F19A (4 - 5 ft) 10/19/2000	SB-F19B (13 - 14 ft) 10/19/2000	SB-F20A (2.5 - 3.5 ft) 10/24/2000	SB-F21A (2.5 - 3.5 ft) 10/17/2000	SB-F22A (2.5 - 3.5 ft) 10/24/2000	SB-F23A (3 - 4 ft) 10/25/2000
Groundwater Depth (feet)[a]			Not Defined	16	16	Not Defined	21	23.5	20
Semivolatile Organics (mg/kg)									
Acenaphthene	190,000	4700	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Acenaphthylene	190,000	6,900	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Anthracene	190,000	350	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Benzo (a) anthracene	190,000	320	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	0.18 J	0.027 J
Benzo (a) pyrene	190,000	46	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	0.029 J
Benzo (b) fluoranthene	190,000	170	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	0.2 J	0.025 J
Benzo (k) fluoranthene	190,000	610	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	0.19 J	0.024 J
Benzo (ghi) perylene	190,000	180	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	0.021 J
bis(2-Ethylhexyl) phthalate	10,000	130	0.33 J	0.054 J	0.037 J	0.029 J	0.25 J	0.13 J	0.065 J
Butyl benzyl phthalate	10,000	10,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Chrysene	190,000	230	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	0.2 J	0.026 J
Dibenz(a,h)anthracene	190,000	160	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Dibenzofuran	100[m]	0.5[m]	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Fluoranthene	190,000	3,200	< 0.028 J	< 0.4	< 0.4	< 0.4	< 0.37	0.5 J	0.029 J
Fluorene	190,000	3,800	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Indeno(1,2,3-cd) pyrene	190,000	28,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	0.021 J
2-Methylnaphthalene	10,000	8,000	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	0.21 J	< 0.41
2-Methylphenol	10,000	510	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	0.2 J
Naphthalene	190,000	25	0.19 J	< 0.4	< 0.4	< 0.4	< 0.37	3.8	< 0.41
Phenanthrene	190,000	10,000	0.029 J	< 0.4	< 0.4	< 0.4	< 0.37	0.34 J	< 0.41
Phenol	190,000	400	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	< 2.2	< 0.41
Pyrene	190,000	2,200	< 0.4	< 0.4	< 0.4	< 0.4	< 0.37	0.23 J	< 0.41
Polychlorinated Biphenyls (ug/kg)	[n]	[n]	*None Detected*						
Other (mg/kg)									
Hydrocarbons as GRO			11	< 0.12	< 0.12	0.19	< 0.11	1,500	2
Hydrocarbons as DRO			12	< 12	10 J	14	< 11	1,700	4.3 J
pH (standard units)			6.4	3.9	6.3	4.9	6.9	12.5	7.2
Total Organic Carbon			8,620	4,650	2,610	3,990	1,060	14,000	3,780
TPH			< 39.6	481	< 39.9	96.1	< 37.3	1,740	< 41.0

CUMMINGS RITER

TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[h] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F24 (2 - 3 ft) 10/25/2000	SB-F25 (2 - 3 ft) 10/25/2000	SB-F26 (2 - 3 ft) 10/25/2000	SB-F27 (2 - 3 ft) 10/25/2000	SB-F28 (2 - 3 ft) 10/25/2000
Groundwater Depth (feet)[a]			No Log	No Log	No Log	No Log	No Log
Inorganics (mg/kg)							
Antimony	190,000	27	0.96 J	0.38 J	0.98 J	0.79 J	0.66 B
Arsenic	190,000	150	13.7	5.4	12.8	12.2	9.8
Barium	190,000	8,200	50.0	78.3	263	47.8	115
Beryllium	190,000	320	0.88	1.2	1.8	0.55 B	1.1
Cadmium	190,000	38	< 0.6	0.075 B	0.6 B	< 0.62	0.15 B
Chromium	190,000[f]	190[f]	19.2 J	13.3 J	73.8 J	17.9 J	14.7 J
Cobalt	190,000	200	36.8	14.7	12.5	8.8	18.2
Copper	190,000	36,000	14.3	19.4	28.2	12.6	17.0
Lead	190,000	450	28.9	21.3	51.0	15.9	20.5
Mercury	190,000	10	0.029 B	0.031 B	0.21	0.035 B	0.035 B
Nickel	190,000	650	13.9	18.0	24.1	11.0	19.7
Selenium	190,000	26	1.4	0.30 B	2.7 B	1.2	0.77
Silver	190,000	84	0.12 B	< 0.62	0.47 B	< 0.62	0.17 B
Thallium	190,000	14	< 2.4	< 1.2	< 6.9	< 1.2	< 1.3
Tin	190,000	6,100	< 11.9	< 12.5	< 13.7	< 12.5	< 12.9
Vanadium	190,000	72,000	32.6	19.9	40.4	28.9	24.6
Zinc	190,000	12,000	44.2	54.6	122	41.8	65.9
Volatile Organics (mg/kg)							
Acetone	10,000	1,000	< 0.023	< 0.0035	0.0045 J,B	< 0.0023	< 0.024
Benzene	240	0.5	< 0.0057	0.002 J	< 0.0035	< 0.0052	< 0.006
1,1-Dichloroethane	1,200	11	< 0.0057	< 0.0057	< 0.0035	< 0.0052	< 0.006
cis-1,2-Dichloroethene	2,100	7	< 0.0029	< 0.0029	< 0.0018	< 0.0026	< 0.003
Ethylbenzene	10,000	70	< 0.0057	0.022	< 0.0038	< 0.0052	< 0.006
Tetrachloroethene	3,300	0.50	< 0.0057	< 0.0057	< 0.0035	< 0.0052	< 0.006
Toluene	10,000	100	< 0.0057	< 0.0057	0.008	< 0.0052	< 0.006
o-Xylene	10,000[g]	1,000[g]	< 0.0029	0.022	< 0.0018	< 0.0026	< 0.003
m-Xylene & p-Xylene	10,000[g]	1,000[g]	< 0.0057	0.0081	< 0.0035	< 0.0052	< 0.006

CUMMINGS RITER

TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC Direct Contact Subsurface Soil[b] (mg/kg)	PADEP MSC Soil to Groundwater Pathway[c] (mg/kg) TDS <2,500 mg/L	SB-F24 (2 - 3 ft) 10/25/2000	SB-F25 (2 - 3 ft) 10/25/2000	SB-F26 (2 - 3 ft) 10/25/2000	SB-F27 (2 - 3 ft) 10/25/2000	SB-F28 (2 - 3 ft) 10/25/2000
Groundwater Depth (feet)[a]			No Log	No Log	No Log	No Log	No Log
Semi-Volatile Organics (mg/kg)							
Acenaphthene	190,000	4,700	< 0.39	< 0.41	0.16 J	< 0.41	< 0.43
Acenaphthylene	190,000	6,900	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
Anthracene	190,000	350	< 0.39	< 0.41	0.27 J	< 0.41	< 0.43
Benzo (a) anthracene	190,000	320	< 0.39	< 0.41	0.98 J	< 0.41	< 0.43
Benzo (a) pyrene	190,000	46	< 0.39	< 0.41	1.2 J	< 0.41	< 0.43
Benzo (b) fluoranthene	190,000	170	< 0.39	< 0.41	0.91 J	< 0.41	< 0.43
Benzo (k) fluoranthene	190,000	610	< 0.39	< 0.41	0.81 J	< 0.41	< 0.43
Benzo (ghi) perylene	190,000	180	< 0.39	< 0.41	0.77 J	< 0.41	< 0.43
bis(2-Ethylhexyl) phthalate	10,000	130	< 0.39	0.04 J	< 2.3	0.072 J	0.12 J
Butyl benzyl phthalate	10,000	10,000	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
Chrysene	190,000	230	< 0.39	< 0.41	0.94 J	< 0.41	< 0.43
Dibenz(a,h)anthracene	190,000	160	< 0.39	< 0.41	0.22 J	< 0.41	< 0.43
Dibenzofuran	100[m]	0.5[m]	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
Fluoranthene	190,000	3,200	< 0.39	< 0.41	1.8 J	< 0.41	< 0.43
Fluorene	190,000	3,800	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
Indeno(1,2,3-cd) pyrene	190,000	28,000	< 0.39	< 0.41	0.78 J	< 0.41	< 0.43
2-Methylnaphthalene	10,000	8,000	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
2-Methylphenol	10,000	510	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
Naphthalene	190,000	25	< 0.39	< 0.41	0.22 J	< 0.41	< 0.43
Phenanthrene	190,000	10,000	< 0.39	< 0.41	0.9 J	< 0.41	< 0.43
Phenol	190,000	400	< 0.39	< 0.41	< 2.3	< 0.41	< 0.43
Pyrene	190,000	2,200	< 0.39	< 0.41	1.3 J	< 0.41	< 0.43
Polychlorinated Biphenyls (ug/kg)	[n]	[n]			*None Detected*		
Other (mg/kg)							
Hydrocarbons as GRO			< 0.12	13	0.32	< 0.12	< 0.13
Hydrocarbons as DRO			15	60	6.1 J	< 12	< 13
pH (standard units)			6.1	6.9	8.2	5.8	5.8
Total Organic Carbon			3,800	5,390	16,600	< 63.6	5,810
TPH			< 39.3	< 41.2	59	< 41.2	< 42.6

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CUMMINGS RITER

TABLE 6
SUMMARY OF SUBSURFACE SOIL RESULTS
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) Groundwater depth based on ARCADIS depth to groundwater during drilling.
(b) PADEP MSC, direct-contact, subsurface soil (Pennsylvania Bulletin, Volume 31, No. 47. November 24, 2001).
(c) PADEP medium specific concentration (MSC) used-aquifer, non-residential soil to groundwater (Pennsylvania Bulletin, Volume 31, No. 47, Nover
(d) Depth below ground surface.
(e) "mg/kg" is milligrams per kilogram or parts per million.
(f) MSC listed is for hexavalent chromium.
(g) MSC is based on total xylenes.
(h) "J" indicates estimated result.
(i) "B" indicates estimated result; result is less than reporting limit.
(j) "<x" indicates the result was not detected above the sample-specific detection limit shown.
(k) "UJ" indicates sample result is estimated and is biased low.
(l) "ug/kg" is micrograms per kilogram or parts per billion.
(m) From Table 6, threshold of regulated compounds (Pennsylvania Bulletin, Volume 31, No. 47, November 24, 2001).
(n) Total PCB not listed; listed for individual aroclors.
(o) Value shaded and shown in bold indicates soil to groundwater MSC exceedance.
(p) "E" indicates the value is estimated because of the presence of interference.

TABLE 7
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
KU RESOURCES (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	Direct Contact Subsurface Soil PADEP MSC[b] (mg/kg)[c]	Soil to Groundwater Pathway PADEP MSC[d] TDS<2,500 mg/L (mg/kg)	B1 10 feet[e]	B5 11 feet	B6 11 feet	B9 3 feet
Groundwater Depth (feet)[a]			11	12.5	15	4.0
Inorganics (mg/kg)						
Arsenic	190,000	150	0.37	0.87	0.86	1.62
Barium	190,000	8,200	97.5	92.8	96	128
Cadmium	190,000	38	<1	<1	<1	<1
Chromium	190,000 [f]	190 [f]	8.6	9	8.6	12.5
Lead	190,000	450	8.5	7.9	7.6	18.6
Selenium	190,000	26	<0.25	<0.25	<0.25	<0.25
Copper	190,000	36,000	24.3	28.8	30.3	33.3
Nickel	190,000	650	9.9	12.7	13.2	15.6
Zinc	190,000	12,000	30.1	33.9	34.9	55.9
Aluminum	190,000	NL[g]	4,950	4,960	5,500	6,130
Calcium	NL	NL	838	986	694	5,207
Cobalt	190,000	200	7.6	7.7	7.7	8.3
Iron	190,000	NL	10,700	12,200	13,800	12,700
Potassium	NL	NL	351	343	396	502
Magnesium	NL	NL	1,070	1,190	1,290	1,220
Manganese	190,000	NL	336	313	402	686
Sodium	NL	NL	296	166	213	284
Vanadium	190,000	72,000	9.9	9.8	9.4	11.6
Cyanide	190,000[h]	200 [h]	<0.05	<0.05	<0.05	<0.05
Volatile Organic Compounds (mg/kg)						
Benzene	240	0.5	1.35[i]	<0.040	<0.002	<0.002
n-Butylbenzene	10,000	2,600	3.49	6.8	0.195	<0.002
sec-Butylbenzene	10,000	960	3.85	5.79	0.247	<0.002
Carbon Disulfide	10,000	410	<0.020	3.88	<0.002	<0.002
Ethylbenzene	10,000	70	17.9	34.8	0.338	0.202
Isopropylbenzene	NL	NL	7.37	16	0.366	<0.002
p-Isopropyltoluene	NL	NL	6.04	13.5	0.127	<0.002
Naphthalene	190,000	25	44.1	81.9	18.6	0.61
n-Propylbenzene	10,000	780	19.9	44.9	0.888	<0.002
Toluene	10,000	100	3.42	<0.040	<0.002	<0.002
1,2,4-Trichlorobenzene	10,000	27	<0.02	<0.040	<0.002	<0.002
1,2,4-Trimethylbenzene	360	20	67.8	116	25.9	0.279
1,3,5-Trimethylbenzene	360	6.2	35.1	63.7	0.705	0.162
Xylenes, Total	10,000	1,000	57.7	67.1	0.283	0.633
m,p-Xylenes	NL	NL	33.6	36.5	0.0777	0.484
o-Xylene	NL	NL	24.1	30.6	0.205	0.139
Semivolatile Organic Compounds (mg/kg)						
Acenaphthylene	190,000	6,900	<0.01	<0.01	<0.01	<0.01
Anthracene	190,000	350	<0.01	<0.01	<0.01	2.87
Benzo(a)anthracene	190,000	320	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	190,000	46	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	190,000	170	<0.01	<0.01	<0.01	0.15
Benzo(k)fluoranthene	190,000	610	<0.01	<0.01	<0.01	0.12
bis (2-Ethylhexyl) phthalate	10,000	130	0.14	3.02	0.51	<0.01
Butylbenzyl phthalate	10,000	10,000	<0.01	<0.01	<0.01	<0.01
4-Chloroaniline	190,000	52	<0.01	<0.01	<0.01	<0.01
Chrysene	190,000	230	<0.01	<0.01	<0.01	<0.01
Dibenzofuran	100[j]	0.5[j]	<0.01	<0.01	<0.01	<0.01
Di-n-butyl phthalate	10,000	4,100	0.2	<0.01	0.1	0.19
2,6-Dinitrotoluene	190,000	10	<0.01	<0.01	<0.01	<0.01
Fluoranthene	190,000	3,200	<0.01	<0.01	<0.01	<0.01
Phenanthrene	190,000	10,000	<0.01	<0.01	<0.01	2.77
Pyrene	190,000	2,200	<0.01	<0.01	<0.01	0.41
2-Methylnapthalene	10,000	8,000	0.75	7.59	0.37	10
PCBs (ug/kg)[k]	[l]	[l]	*None Detected*			

CUMMINGS RITER

TABLE 7
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
KU RESOURCES (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) Groundwater depth based on depth to groundwater during drilling.
(b) PADEP medium specific concentration (MSC), direct-contact, non-residential subsurface soil (2-15 Feet) (Pennsylvania Bulletin, Volume 3, No. 47, November 24, 2001)..
(c) "mg/kg" is milligrams per kilogram or parts per million.
(d) PADEP MSC, used-aquifer, non-residential soil to groundwater.
(e) Depth collected below ground surface.
(f) Value for total and hexavalent chromium.
(g) "NL" indicates a MSC does not exist for this constituent.
(h) Free cyanide MSC.
(i) Value shaded and shown in bold indicates soil to groundwater pathway exceedance. There were no direct-contact MSC exceedances.
(j) From Table 6, threshold of regulatiod compounds (Pennsylvania Bulletin, Volume 3, No. 47, November 24, 2001).
(k) "ug/kg" is micrograms per kilogram or parts per billion.
(l) Total PCBs not listed; listed for individual Aroclors.

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	C-1 (17.5-19.5) 12/3/2003	C-2 (14-16) 12/3/2003	C-3 (14-16) 12/3/2003	C-4 (14-16) 12/2/2003	C-6 (13.5-15.5) 12/2/2003
Volatile Organic Compounds (ug/kg) [a]							
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 7300 [e]	< 5.2	< 4.6	< 190	< 6.4
1,1,1-Trichloroethane	20,000	10,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,1,2,2-Tetrachloroethane	30	33,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,1,2-Trichloroethane	500	120,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,1-Dichloroethane	11,000	1,200,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,1-Dichloroethene	190	38,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,2,3-Trichloropropane	400,000	950	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,2,4-Trimethylbenzene	20,000	360,000	180,000 [f]	< 5.2	< 4.6	16B [g]	< 6.4
1,2-Dibromo-3-chloropropane	20	12,000	< 15,000	< 10	< 9.2	< 390	< 13
1,2-Dibromoethane (EDB)	5	8,600	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,2-Dichloroethane	500	73,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,2-Dichloropropane	500	180,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
1,3,5-Trimethylbenzene	6,200	360,000	97,000	< 5.2	< 4.6	14J [h]	< 6.4
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 37,000	< 26	< 23	190B	16J
2-Hexanone	-- [d]	--	< 37,000	< 26	< 23	< 970	< 32
3-Chloropropene (Allylchloride)	4,100	430,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 37,000	< 26	< 23	< 970	< 32
Acetone	1,000,000	10,000,000	< 73,000	< 52	< 46	700B	79
Acetonitrile	35,000	3,600,000	< 290,000	< 210	< 180	< 7,800	< 260
Acrolein (Propenal)	12	1,200	< 150,000	< 100	< 92	< 3,900	< 130
Acrylonitrile	270	28,000	< 150,000	< 100	< 92	< 3,900	< 130
Benzene	500	240,000	< 7,300	< 5.2	< 4.6	9.7J	< 6.4
Bromodichloromethane	10,000	51,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Bromoform	10,000	1,700,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Bromomethane (Methyl Bromide)	1,000	300,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Carbon disulfide	410,000	10,000,000	< 7,300	< 5.2	< 4.6	< 190	5.8J
Carbon tetrachloride	500	120,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Chlorobenzene	10,000	10,000,000	< 7,300	< 5.2	< 4.6	13J	< 6.4
Chloroethane	90,000	10,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Chloroform	10,000	19,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Chloromethane (Methyl Chloride)	300	1,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Chloroprene	4,100	430,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
cis-1,2-Dichloroethene	7,000	2,100,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
cis-1,3-Dichloropropene [c]	2,600	470,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Dibromochloromethane	--	--	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Dichlorodifluoromethane	100,000	10,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Ethyl methacrylate	180,000	190,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Ethylbenzene	70,000	10,000,000	9,900	< 5.2	< 4.6	25J	< 6.4
Iodomethane (Methyl iodide)	--	--	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 290,000	< 210	< 180	< 7,800	< 260
Methacrylonitrile	410	43,000	< 150,000	< 100	< 92	< 3,900	< 130
Methyl methacrylate	410,000	10,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Methylene chloride (Dichloromethane)	500	1,000,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Pentachloroethane	--	--	< 37,000	< 26	< 23	< 970	< 32
Propionitrile	--	--	< 150,000	< 100	< 92	< 3,900	< 130
Styrene	24,000	10,000,000	1,100J	< 5.2	< 4.6	28B	< 6.4
Tetrachloroethene	500	3,300,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Toluene	100,000	10,000,000	< 7,300	< 5.2	< 4.6	20,000B	14
trans-1,2-Dichloroethene	10,000	4,300,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
trans-1,3-Dichloropropene [c]	2,600	470,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
trans-1,4-Dichloro-2-butene	7	190,000,000	< 15,000	< 10	< 9.2	< 390	< 13
Trichloroethene	500	1,100,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Trichlorofluoromethane	--	--	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Vinyl acetate	120,000	10,000,000	< 15,000	< 10	< 9.2	< 390	< 13
Vinyl chloride	200	220,000	< 7,300	< 5.2	< 4.6	< 190	< 6.4
Xylenes, Total	1,000,000	10,000,000	84,000	< 10	< 9.2	48J	< 13

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	C-1 (17.5-19.5) 12/3/2003	C-2 (14-16) 12/3/2003	C-3 (14-16) 12/3/2003	C-4 (14-16) 12/2/2003	C-6 (13.5-15.5) 12/2/2003
Semivolatile Organic Compounds (ug/kg)							
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 460	< 420	< 390	< 400	< 400
1,2,4-Trichlorobenzene	27,000	10,000,000	< 460	< 420	< 390	< 400	< 400
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 460	< 420	< 390	< 400	< 400
1,3,5-Trinitrobenzene	--	--	< 460	< 420	< 390	< 400	< 400
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 460	< 420	< 390	< 400	< 400
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 460	< 420	< 390	< 400	< 400
1,4-Dioxane	2,400	240,000	< 460	< 420	< 390	< 400	< 400
1,4-Naphthoquinone	--	--	< 460	< 420	< 390	< 400	< 400
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1,100	190,000,000	< 460	< 420	< 390	< 400	< 400
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 460	< 420	< 390	< 400	< 400
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 460	< 420	< 390	< 400	< 400
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 460	< 420	< 390	< 400	< 400
2,4,6-Trichlorophenol	8,900	190,000,000	< 460	< 420	< 390	< 400	< 400
2,4-Dichlorophenol	2,000	190,000,000	< 460	< 420	< 390	< 400	< 400
2,4-Dimethylphenol	200,000	10,000,000	< 460	< 420	< 390	< 400	< 400
2,4-Dinitrophenol	4,100	190,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
2,4-Dinitrotoluene	840	190,000,000	< 460	< 420	< 390	< 400	< 400
2,6-Dichlorophenol	--	--	< 460	< 420	< 390	< 400	< 400
2,6-Dinitrotoluene	10,000	190,000,000	< 460	< 420	< 390	< 400	< 400
2-Acetylaminofluorene	280	190,000,000	< 460	< 420	< 390	< 400	< 400
2-Chloronaphthalene	18,000,000	190,000,000	< 460	< 420	< 390	< 400	< 400
2-Chlorophenol	4,400	1,100,000	< 460	< 420	< 390	< 400	< 400
2-Methylnaphthalene	8,000,000	10,000,000	200J	< 420	< 390	< 400	50J
2-Naphthylamine	140	190,000,000	< 460	< 420	< 390	< 400	< 400
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 460	< 420	< 390	< 400	< 400
2-Picoline	--	--	< 460	< 420	< 390	< 400	< 400
3,3'-Dichlorobenzidine	32,000	190,000,000	< 930	< 840	< 780	< 800	< 800
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
3-Methylcholanthrene	--	--	< 460	< 420	< 390	< 400	< 400
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
4-Aminobiphenyl	12	190,000,000	< 460	< 420	< 390	< 400	< 400
4-Bromophenylphenyl ether	--	--	< 460	< 420	< 390	< 400	< 400
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 460	< 420	< 390	< 400	< 400
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 930	< 840	< 780	< 800	< 800
4-Chlorophenylphenyl ether	--	--	< 460	< 420	< 390	< 400	< 400
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
4-Nitroquinoline-1-oxide	--	--	< 4,600	< 4,200	< 3,900	< 4,000	< 4,000
5-Nitro-o-toluidine	--	--	< 460	< 420	< 390	< 400	< 400
7,12-Dimethylbenz(a)anthracene	--	--	< 460	< 420	< 390	< 400	< 400
Acenaphthene	4,700,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Acenaphthylene	6,900,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Acetophenone	1,000,000	10,000,000	< 460	< 420	< 390	< 400	< 400
alpha,alpha-Dimethylphenethylamine	--	--	< 94,000	< 85,000	< 79,000	< 81,000	< 81,000
Aniline	580	600,000	< 460	< 420	< 390	< 400	< 400
Anthracene	350,000	190,000,000	< 460	< 420	< 390	< 400	160J
Aramite, Total	--	--	< 460	< 420	< 390	< 400	< 400
Benzo(a)anthracene	320,000	190,000,000	86J	< 420	< 390	< 400	510
Benzo(a)pyrene	46,000	190,000,000	84J	< 420	< 390	< 400	440
Benzo(b)fluoranthene	170,000	190,000,000	< 460	< 420	< 390	< 400	320J
Benzo(g,h,i)perylene	180,000	190,000,000	76J	< 420	< 390	< 400	240J
Benzo(k)fluoranthene	610,000	190,000,000	100J	< 420	< 390	< 400	400
Benzyl alcohol	3,100,000	10,000,000	< 460	< 420	< 390	< 400	< 400
bis(2-Chloroethoxy)methane	--	--	< 460	< 420	< 390	< 400	< 400
bis(2-Chloroethyl)ether	55	5,700	< 460	< 420	< 390	< 400	< 400

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	C-1 (17.5-19.5) 12/3/2003	C-2 (14-16) 12/3/2003	C-3 (14-16) 12/3/2003	C-4 (14-16) 12/2/2003	C-6 (13.5-15.5) 12/2/2003
Semivolatile Organic Compounds (continued) (ug/kg)							
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Butylbenzylphthalate	10,000,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Chrysene	230,000	190,000,000	100J	< 420	< 390	< 400	470
Cresol (ortho)	510,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Cresol, m & p	51,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Diallate, Total	1,000	110,000	< 460	< 420	< 390	< 400	< 400
Dibenzo(a,h)anthracene	160,000	190,000,000	45	< 420	< 390	< 400	< 400
Dibenzofuran	--	--	< 460	< 420	< 390	< 400	52J
Diethylphthalate	500,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Dimethoate	2,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Dimethylphthalate	--	--	< 460	< 420	< 390	< 400	< 400
Di-n-butylphthalate	4,100,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Di-n-octylphthalate	10,000,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 460	< 420	< 390	< 400	< 400
Disulfoton	78	8,700	< 460	< 420	< 390	< 400	< 400
Ethyl methanesulfonate	--	--	< 460	< 420	< 390	< 400	< 400
Ethyl parathion (Parathion)	360,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Famphur	--	--	< 460	< 420	< 390	< 400	< 400
Fluoranthene	3,200,000	190,000,000	180J	< 420	< 390	< 400	970
Fluorene	3,800,000	190,000,000	< 460	< 420	< 390	< 400	68J
Hexachlorobenzene	960	190,000,000	< 460	< 420	< 390	< 400	< 400
Hexachlorobutadiene	1,200	10,000,000	< 460	< 420	< 390	< 400	< 400
Hexachlorocyclopentadiene	91,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Hexachloroethane	560	190,000,000	< 460	< 420	< 390	< 400	< 400
Hexachlorophene	--	--	< 240,000	< 220,000	< 200,000	< 200,000	< 200,000
Hexachloropropene	--	--	< 460	< 420	< 390	< 400	< 400
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	56	< 420	< 390	< 400	210J
Isophorone	10,000	10,000,000	< 460	< 420	< 390	< 400	< 400
Isosafrole	--	--	< 460	< 420	< 390	< 400	< 400
m-Dinitrobenzene	100	190,000,000	< 460	< 420	< 390	< 400	< 400
Methapyrilene	--	--	< 94,000	< 85,000	< 79,000	< 81,000	< 81,000
Methyl methanesulfonate	2,600	190,000,000	< 460	< 420	< 390	< 400	< 400
Methyl parathion	420	55,000	< 460	< 420	< 390	< 400	< 400
Naphthalene	25,000	190,000,000	1,700	< 420	< 390	< 400	55J
Nitrobenzene	5,100	10,000,000	< 460	< 420	< 390	< 400	< 400
N-Nitrosodiethylamine	1.3	44	< 460	< 420	< 390	< 400	< 400
N-Nitrosodimethylamine	1.3	130	< 460	< 420	< 390	< 400	< 400
N-Nitrosodi-n-butylamine	14	10,000,000	< 460	< 420	< 390	< 400	< 400
n-Nitrosodi-n-propylamine	37	10,000,000	< 460	< 420	< 390	< 400	< 400
N-Nitrosodiphenylamine	83,000	190,000,000	< 460	< 420	< 390	< 400	< 400
N-Nitrosomethylethylamine	--	--	< 460	< 420	< 390	< 400	< 400
N-Nitrosomorpholine	--	--	< 460	< 420	< 390	< 400	< 400
N-Nitrosopiperidine	--	--	< 460	< 420	< 390	< 400	< 400
N-Nitrosopyrrolidine	--	--	< 460	< 420	< 390	< 400	< 400
O,O,O-Triethyl phosphorothioate	--	--	< 460	< 420	< 390	< 400	< 400
o-Toluidine	1,200	10,000,000	< 460	< 420	< 390	< 400	< 400
p-(Dimethylamino)azobenzene	150	190,000,000	< 460	< 420	< 390	< 400	< 400
Pentachlorobenzene	660,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Pentachloronitrobenzene	20,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Pentachlorophenol	5,000	190,000,000	< 2,400	< 2,200	< 2,000	< 2,000	< 2,000
Phenacetin	120,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Phenol	400,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Phenanthrene	10,000,000	190,000,000	120J	< 420	< 390	< 400	520
Phorate	880	43,000	< 460	< 420	< 390	< 400	< 400
Pronamide	5,000	190,000,000	< 460	< 420	< 390	< 400	< 400
Pyrene	2,200,000	190,000,000	140J	< 420	< 390	< 400	920
Pyridine	2,000	210,000	< 460	< 420	< 390	< 400	< 400
Safrole	--	--	< 460	< 420	< 390	< 400	< 400
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 460	< 420	< 390	< 400	< 400
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 460	< 420	< 390	< 400	< 400

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	C-1 (17.5-19.5) 12/3/2003	C-2 (14-16) 12/3/2003	C-3 (14-16) 12/3/2003	C-4 (14-16) 12/2/2003	C-6 (13.5-15.5) 12/2/2003
Inorganics (mg/kg) [a]							
Antimony	27	190,000	< 2.7	< 2.3	< 2.1	< 2.3	1.1J
Arsenic	150	190,000	15	10	11	9.8	14
Barium	8,200	190,000	170	110	130	130	110
Beryllium	320	190,000	1.2	0.88	0.81	0.82	1.1
Cadmium	38	190,000	0.27J	0.21J	0.17J	< 0.57	0.5J
Chromium	190,000	190,000	23	18	16	18	27
Cobalt	200	190,000	8.2	15	12	11	12
Copper	36,000	190,000	49K	21K	19K[j]	21	28K
Lead	450	190,000	27K	15K	13K	13	120K
Mercury	10	190,000	0.11	0.02	0.02	0.025	0.15
Nickel	650	190,000	23	23	21	23	20
Selenium	26	190,000	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1
Silver	84	190,000	< 1.3L[i]	< 1.1L	< 1.1L	< 1.1	< 1.1L
Thallium	14	190,000	< 1.3	< 1.1	< 1.1	< 1.1	< 1.1
Tin	6,100	190,000	5.1B	1.8B	1.9B	1.9	9.3
Vanadium	72,000	190,000	30	25	23	26	20
Zinc	12,000	190,000	68K	66K	61K	67	110K

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	FP-1 (13.6-15.6) 12/2/2003	FP-2 (14.5-16.5) 11/25/2003	FP-3 (14-16) 12/2/2003	FP-4 (17.5-19.5) 12/2/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9 [k]
1,1,1-Trichloroethane	20,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,1,2,2-Tetrachloroethane	30	33,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,1,2-Trichloroethane	500	120,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,1-Dichloroethane	11,000	1,200,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,1-Dichloroethene	190	38,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,2,3-Trichloropropane	400,000	950	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,2,4-Trimethylbenzene	20,000	360,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,2-Dibromo-3-chloropropane	20	12,000	< 10	< 10	< 10	<9.8/<11
1,2-Dibromoethane (EDB)	5	8,600	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,2-Dichloroethane	500	73,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,2-Dichloropropane	500	180,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
1,3,5-Trimethylbenzene	6,200	360,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 26	< 25	< 26	<24/<27
2-Hexanone	-- [d]	--	< 26	< 25	< 26	<24/<27
3-Chloropropene (Allylchloride)	4,100	430,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 26	< 25	< 26	<24/<27
Acetone	1,000,000	10,000,000	< 53	58	< 52	<49/<54
Acetonitrile	35,000	3,600,000	< 210	< 200	< 210	<200/<220
Acrolein (Propenal)	12	1,200	< 100	< 100	< 100	<98/<110
Acrylonitrile	270	28,000	< 100	< 100	< 100	<98/<110
Benzene	500	240,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Bromodichloromethane	10,000	51,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Bromoform	10,000	1,700,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Bromomethane (Methyl Bromide)	1,000	300,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Carbon disulfide	410,000	10,000,000	< 5.3	5.9	< 5.2	<4.9/<4.9
Carbon tetrachloride	500	120,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Chlorobenzene	10,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Chloroethane	90,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Chloroform	10,000	19,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Chloromethane (Methyl Chloride)	300	1,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Chloroprene	4,100	430,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
cis-1,2-Dichloroethene	7,000	2,100,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
cis-1,3-Dichloropropene [c]	2,600	470,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Dibromochloromethane	--	--	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Dichlorodifluoromethane	100,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Ethyl methacrylate	180,000	190,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Ethylbenzene	70,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Iodomethane (Methyl iodide)	--	--	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 210	< 200	< 210	<200/<220
Methacrylonitrile	410	43,000	< 100	< 100	< 100	<98/<110
Methyl methacrylate	410,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Methylene chloride (Dichloromethane)	500	1,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Pentachloroethane	--	--	< 26	< 25	< 26	<24/<27
Propionitrile	--	--	< 100	< 100	< 100	<98/<110
Styrene	24,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Tetrachloroethene	500	3,300,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Toluene	100,000	10,000,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
trans-1,2-Dichloroethene	10,000	4,300,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
trans-1,3-Dichloropropene [c]	2,600	470,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
trans-1,4-Dichloro-2-butene	7	190,000,000	< 10	< 10	< 10	<9.8/<11
Trichloroethene	500	1,100,000	< 5.3	< 5.1	33	<4.9/<4.9
Trichlorofluoromethane	--	--	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Vinyl acetate	120,000	10,000,000	< 10	< 10	< 10	<9.8/<11
Vinyl chloride	200	220,000	< 5.3	< 5.1	< 5.2	<4.9/<4.9
Xylenes, Total	1,000,000	10,000,000	< 10	< 10	< 10	<9.8/<11

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	FP-1 (13.6-15.6) 12/2/2003	FP-2 (14.5-16.5) 11/25/2003	FP-3 (14-16) 12/2/2003	FP-4 (17.5-19.5) 12/2/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 410	< 400	< 410	<400/<410
1,2,4-Trichlorobenzene	27,000	10,000,000	< 410	< 400	< 410	<400/<410
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 410	< 400	< 410	<400/<410
1,3,5-Trinitrobenzene	--	--	< 410	< 400	< 410	<400/<410
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 410	< 400	< 410	<400/<410
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 410	< 400	< 410	<400/<410
1,4-Dioxane	2,400	240,000	< 410	< 400	< 410	<400/<410
1,4-Naphthoquinone	--	--	< 410	< 400	< 410	<400/<410
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,100	< 2,100	< 2,100	<2,100/<2,100
1-Naphthylamine	1,100	190,000,000	< 410	< 400	< 410	<400/<410
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 410	< 400	< 410	<400/<410
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 410	< 400	< 410	<400/<410
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 410	< 400	< 410	<400/<410
2,4,6-Trichlorophenol	8,900	190,000,000	< 410	< 400	< 410	<400/<410
2,4-Dichlorophenol	2,000	190,000,000	< 410	< 400	< 410	<400/<410
2,4-Dimethylphenol	200,000	10,000,000	< 410	< 400	< 410	<400/<410
2,4-Dinitrophenol	4,100	190,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
2,4-Dinitrotoluene	840	190,000,000	< 410	< 400	< 410	<400/<410
2,6-Dichlorophenol	--	--	< 410	< 400	< 410	<400/<410
2,6-Dinitrotoluene	10,000	190,000,000	< 410	< 400	< 410	<400/<410
2-Acetylaminofluorene	280	190,000,000	< 410	< 400	< 410	<400/<410
2-Chloronaphthalene	18,000,000	190,000,000	< 410	< 400	< 410	<400/<410
2-Chlorophenol	4,400	1,100,000	< 410	< 400	< 410	<400/<410
2-Methylnaphthalene	8,000,000	10,000,000	< 410	< 400	< 410	<400/<410
2-Naphthylamine	140	190,000,000	< 410	< 400	< 410	<400/<410
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 410	< 400	< 410	<400/<410
2-Picoline	--	--	< 410	< 400	< 410	<400/<410
3,3'-Dichlorobenzidine	32,000	190,000,000	< 820	< 800	< 820	<800/<810
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
3-Methylcholanthrene	--	--	< 410	< 400	< 410	<400/<410
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,100	< 2,100	< 2,100	<2,100/<2,100
4-Aminobiphenyl	12	190,000,000	< 410	< 400	< 410	<400/<410
4-Bromophenylphenyl ether	--	--	< 410	< 400	< 410	<400/<410
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 410	< 400	< 410	<400/<410
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 820	< 800	< 820	<800/<810
4-Chlorophenylphenyl ether	--	--	< 410	< 400	< 410	<400/<410
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
4-Nitroquinoline-1-oxide	--	--	< 4,100	< 4,000	< 4,100	<4,000/<4,100
5-Nitro-o-toluidine	--	--	< 410	< 400	< 410	<400/<410
7,12-Dimethylbenz(a)anthracene	--	--	< 410	< 400	< 410	<400/<410
Acenaphthene	4,700,000	190,000,000	< 410	< 400	< 410	<400/<410
Acenaphthylene	6,900,000	190,000,000	< 410	< 400	< 410	<400/<410
Acetophenone	1,000,000	10,000,000	< 410	< 400	< 410	<400/<410
alpha,alpha-Dimethylphenethylamine	--	--	< 84,000	< 82,000	< 84,000	<82,000/<83,000
Aniline	580	600,000	< 410	< 400	< 410	<400/<410
Anthracene	350,000	190,000,000	< 410	< 400	< 410	<400/<410
Aramite, Total	--	--	< 410	< 400	< 410	<400/<410
Benzo(a)anthracene	320,000	190,000,000	< 410	< 400	< 410	<400/<410
Benzo(a)pyrene	46,000	190,000,000	< 410	< 400	< 410	<400/<410
Benzo(b)fluoranthene	170,000	190,000,000	< 410	< 400	< 410	<400/<410
Benzo(g,h,i)perylene	180,000	190,000,000	< 410	< 400	< 410	<400/<410
Benzo(k)fluoranthene	610,000	190,000,000	< 410	< 400	< 410	<400/<410
Benzyl alcohol	3,100,000	10,000,000	< 410	< 400	< 410	<400/<410
bis(2-Chloroethoxy)methane	--	--	< 410	< 400	< 410	<400/<410
bis(2-Chloroethyl)ether	55	5,700	< 410	< 400	< 410	<400/<410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	FP-1 (13.6-15.6) 12/2/2003	FP-2 (14.5-16.5) 11/25/2003	FP-3 (14-16) 12/2/2003	FP-4 (17.5-19.5) 12/2/2003
Semivolatile Organic Compounds (continued) (ug/kg)						
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 410	< 400	< 410	<400/<410
Butylbenzylphthalate	10,000,000	10,000,000	< 410	< 400	< 410	<400/<410
Chrysene	230,000	190,000,000	< 410	< 400	< 410	<400/<410
Cresol (ortho)	510,000	10,000,000	< 410	< 400	< 410	<400/<410
Cresol, m & p	51,000	190,000,000	< 410	< 400	< 410	<400/<410
Diallate, Total	1,000	110,000	< 410	< 400	< 410	<400/<410
Dibenzo(a,h)anthracene	160,000	190,000,000	< 410	< 400	< 410	<400/<410
Dibenzofuran	--	--	< 410	< 400	< 410	<400/<410
Diethylphthalate	500,000	10,000,000	< 410	< 400	< 410	<400/<410
Dimethoate	2,000	190,000,000	< 410	< 400	< 410	<400/<410
Dimethylphthalate	--	--	< 410	< 400	< 410	<400/<410
Di-n-butylphthalate	4,100,000	10,000,000	< 410	< 400	< 410	<400/<410
Di-n-octylphthalate	10,000,000	10,000,000	< 410	< 400	< 410	<400/<410
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 410	< 400	< 410	<400/<410
Disulfoton	78	8,700	< 410	< 400	< 410	<400/<410
Ethyl methanesulfonate	--	--	< 410	< 400	< 410	<400/<410
Ethyl parathion (Parathion)	360,000	10,000,000	< 410	< 400	< 410	<400/<410
Famphur	--	--	< 410	< 400	< 410	<400/<410
Fluoranthene	3,200,000	190,000,000	< 410	< 400	< 410	<400/<410
Fluorene	3,800,000	190,000,000	< 410	< 400	< 410	<400/<410
Hexachlorobenzene	960	190,000,000	< 410	< 400	< 410	<400/<410
Hexachlorobutadiene	1,200	10,000,000	< 410	< 400	< 410	<400/<410
Hexachlorocyclopentadiene	91,000	10,000,000	< 410	< 400	< 410	<400/<410
Hexachloroethane	560	190,000,000	< 410	< 400	< 410	<400/<410
Hexachlorophene	--	--	< 210,000	< 210,000	< 210,000	<210,000/<210,000
Hexachloropropene	--	--	< 410	< 400	< 410	<400/<410
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 410	< 400	< 410	<400/<410
Isophorone	10,000	10,000,000	< 410	< 400	< 410	<400/<410
Isosafrole	--	--	< 410	< 400	< 410	<400/<410
m-Dinitrobenzene	100	190,000,000	< 410	< 400	< 410	<400/<410
Methapyrilene	--	--	< 84,000	< 82,000	< 84,000	<82,000/<83,000
Methyl methanesulfonate	2,600	190,000,000	< 410	< 400	< 410	<400/<410
Methyl parathion	420	55,000	< 410	< 400	< 410	<400/<410
Naphthalene	25,000	190,000,000	< 410	< 400	< 410	<400/<410
Nitrobenzene	5,100	10,000,000	< 410	< 400	< 410	<400/<410
N-Nitrosodiethylamine	1.3	44	< 410	< 400	< 410	<400/<410
N-Nitrosodimethylamine	1.3	130	< 410	< 400	< 410	<400/<410
N-Nitrosodi-n-butylamine	14	10,000,000	< 410	< 400	< 410	<400/<410
n-Nitrosodi-n-propylamine	37	10,000,000	< 410	< 400	< 410	<400/<410
N-Nitrosodiphenylamine	83,000	190,000,000	< 410	< 400	< 410	<400/<410
N-Nitrosomethylethylamine	--	--	< 410	< 400	< 410	<400/<410
N-Nitrosomorpholine	--	--	< 410	< 400	< 410	<400/<410
N-Nitrosopiperidine	--	--	< 410	< 400	< 410	<400/<410
N-Nitrosopyrrolidine	--	--	< 410	< 400	< 410	<400/<410
O,O,O-Triethyl phosphorothioate	--	--	< 410	< 400	< 410	<400/<410
o-Toluidine	1,200	10,000,000	< 410	< 400	< 410	<400/<410
p-(Dimethylamino)azobenzene	150	190,000,000	< 410	< 400	< 410	<400/<410
Pentachlorobenzene	660,000	190,000,000	< 410	< 400	< 410	<400/<410
Pentachloronitrobenzene	20,000	190,000,000	< 410	< 400	< 410	<400/<410
Pentachlorophenol	5,000	190,000,000	< 2,100	< 2,100	< 2,100	<2,100/<2,100
Phenacetin	120,000	190,000,000	< 410	< 400	< 410	<400/<410
Phenol	400,000	190,000,000	< 410	< 400	< 410	<400/<410
Phenanthrene	10,000,000	190,000,000	< 410	< 400	< 410	<400/<410
Phorate	880	43,000	< 410	< 400	< 410	<400/<410
Pronamide	5,000	190,000,000	< 410	< 400	< 410	<400/<410
Pyrene	2,200,000	190,000,000	< 410	< 400	< 410	<400/<410
Pyridine	2,000	210,000	< 410	< 400	< 410	<400/<410
Safrole	--	--	< 410	< 400	< 410	<400/<410
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 410	< 400	< 410	<400/<410
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 410	< 400	< 410	<400/<410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	FP-1 (13.6-15.6) 12/2/2003	FP-2 (14.5-16.5) 11/25/2003	FP-3 (14-16) 12/2/2003	FP-4 (17.5-19.5) 12/2/2003
Inorganics (mg/kg) [a]						
Antimony	27	190,000	< 2.3	< 2.3	< 2.4	<2.3/<2.4
Arsenic	150	190,000	9	9.1L	10	9.5/9.6
Barium	8,200	190,000	210	120	150	120/120
Beryllium	320	190,000	0.99	0.85	0.95	0.77/0.77
Cadmium	38	190,000	0.073J	0.14J	0.094J	<0.57/<0.6
Chromium	190,000	190,000	23	17	20	16/16
Cobalt	200	190,000	13	13	15	12/12
Copper	36,000	190,000	23K	22	23K	18K/19K
Lead	450	190,000	15K	14L	17K	13K/13K
Mercury	10	190,000	0.028	0.02	0.024	0.018J/0.017J
Nickel	650	190,000	25	25	26	21/21
Selenium	26	190,000	< 1.2	< 1.1L	< 1.2	<1.2/<1.2
Silver	84	190,000	< 1.2L	< 1.1	< 1.2L	<1.2L/<1.2L
Thallium	14	190,000	< 1.2	< 1.1	< 1.2	<1.2/<1.2
Tin	6,100	190,000	1.8B	2.8B	2.2B	2.2B/2B
Vanadium	72,000	190,000	31	23	29	23/23
Zinc	12,000	190,000	73K	65	71K	59K/59K

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	LP-1 (15.1-17.1) 12/4/2003	LP-2 (14.7-16.7) 12/11/2003	LP-3 (19.5-21.5) 12/11/2003	LP-4 (14-16) 12/3/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,1,1-Trichloroethane	20,000	10,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,1,2,2-Tetrachloroethane	30	33,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,1,2-Trichloroethane	500	120,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,1-Dichloroethane	11,000	1,200,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,1-Dichloroethene	190	38,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,2,3-Trichloropropane	400,000	950	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,2,4-Trimethylbenzene	20,000	360,000	< 5.8	3,500	2.5J/<5.8	38
1,2-Dibromo-3-chloropropane	20	12,000	< 12	< 11	<11/<12	< 10
1,2-Dibromoethane (EDB)	5	8,600	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,2-Dichloroethane	500	73,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,2-Dichloropropane	500	180,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
1,3,5-Trimethylbenzene	6,200	360,000	< 5.8	3,000	1.6J/<5.8	20
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 29	< 27	<27/<29	< 26
2-Hexanone	-- [d]	--	< 29	< 27	<27/<29	< 26
3-Chloropropene (Allylchloride)	4,100	430,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 29	170	<27/<29	< 26
Acetone	1,000,000	10,000,000	< 58	27J	20J/23J	< 52
Acetonitrile	35,000	3,600,000	< 230	< 220	<220/<230	< 210
Acrolein (Propenal)	12	1,200	< 120	< 110	<110/<120	< 100
Acrylonitrile	270	28,000	< 120	< 110	<110/<120	< 100
Benzene	500	240,000	< 5.8	< 5.5	<5.4/<5.8	36
Bromodichloromethane	10,000	51,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Bromoform	10,000	1,700,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Bromomethane (Methyl Bromide)	1,000	300,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Carbon disulfide	410,000	10,000,000	< 5.8	25	<5.4/<5.8	< 5.2
Carbon tetrachloride	500	120,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Chlorobenzene	10,000	10,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Chloroethane	90,000	10,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Chloroform	10,000	19,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Chloromethane (Methyl Chloride)	300	1,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Chloroprene	4,100	430,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
cis-1,2-Dichloroethene	7,000	2,100,000	2.1J	< 5.5	<5.4/<5.8	< 5.2
cis-1,3-Dichloropropene [c]	2,600	470,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Dibromochloromethane	--	--	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Dichlorodifluoromethane	100,000	10,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Ethyl methacrylate	180,000	190,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Ethylbenzene	70,000	10,000,000	< 5.8	1,400	<5.4/<5.8	37
Iodomethane (Methyl iodide)	--	--	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 230	< 220	<220/<230	< 210
Methacrylonitrile	410	43,000	< 120	< 110	<110/<120	< 100
Methyl methacrylate	410,000	10,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Methylene chloride (Dichloromethane)	500	1,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Pentachloroethane	--	--	< 29	< 27	<27/<29	< 26
Propionitrile	--	--	< 120	< 110	<110/<120	< 100
Styrene	24,000	10,000,000	< 5.8	4J	<5.4/<5.8	7.4
Tetrachloroethene	500	3,300,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Toluene	100,000	10,000,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
trans-1,2-Dichloroethene	10,000	4,300,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
trans-1,3-Dichloropropene [c]	2,600	470,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
trans-1,4-Dichloro-2-butene	7	190,000,000	< 12	< 11	<11/<12	< 10
Trichloroethene	500	1,100,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Trichlorofluoromethane	--	--	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Vinyl acetate	120,000	10,000,000	< 12	< 11	<11/<12	< 10
Vinyl chloride	200	220,000	< 5.8	< 5.5	<5.4/<5.8	< 5.2
Xylenes, Total	1,000,000	10,000,000	< 12	560	<11/<12	15

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	LP-1 (15.1-17.1) 12/4/2003	LP-2 (14.7-16.7) 12/11/2003	LP-3 (19.5-21.5) 12/11/2003	LP-4 (14-16) 12/3/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 440	< 430	<410/<420	< 410
1,2,4-Trichlorobenzene	27,000	10,000,000	< 440	< 430	<410/<420	< 410
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 440	< 430	<410/<420	< 410
1,3,5-Trinitrobenzene	--	--	< 440	< 430	<410/<420	< 410
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 440	< 430	<410/<420	< 410
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 440	< 430	<410/<420	< 410
1,4-Dioxane	2,400	240,000	< 440	< 430	<410/<420	< 410
1,4-Naphthoquinone	--	--	< 440	< 430	<410/<420	< 410
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,300	< 2,200	<2,100/<2,200	< 2,100
1-Naphthylamine	1,100	190,000,000	< 440	< 430	<410/<420	< 410
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 440	< 430	<410/<420	< 410
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 440	< 430	<410/<420	< 410
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 440	< 430	<410/<420	< 410
2,4,6-Trichlorophenol	8,900	190,000,000	< 440	< 430	<410/<420	< 410
2,4-Dichlorophenol	2,000	190,000,000	< 440	< 430	<410/<420	< 410
2,4-Dimethylphenol	200,000	10,000,000	< 440	< 430	<410/<420	< 410
2,4-Dinitrophenol	4,100	190,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
2,4-Dinitrotoluene	840	190,000,000	< 440	< 430	<410/<420	< 410
2,6-Dichlorophenol	--	--	< 440	< 430	<410/<420	< 410
2,6-Dinitrotoluene	10,000	190,000,000	< 440	< 430	<410/<420	< 410
2-Acetylaminofluorene	280	190,000,000	< 440	< 430	<410/<420	< 410
2-Chloronaphthalene	18,000,000	190,000,000	< 440	< 430	<410/<420	< 410
2-Chlorophenol	4,400	1,100,000	< 440	< 430	<410/<420	< 410
2-Methylnaphthalene	8,000,000	10,000,000	< 440	< 430	<410/<420	< 410
2-Naphthylamine	140	190,000,000	< 440	< 430	<410/<420	< 410
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 440	< 430	<410/<420	< 410
2-Picoline	--	--	< 440	< 430	<410/<420	< 410
3,3'-Dichlorobenzidine	32,000	190,000,000	< 890	< 870	<820/<840	< 820
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
3-Methylcholanthrene	--	--	< 440	< 430	<410/<420	< 410
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,300	< 2,200	<2,100/<2,200	< 2,100
4-Aminobiphenyl	12	190,000,000	< 440	< 430	<410/<420	< 410
4-Bromophenylphenyl ether	--	--	< 440	< 430	<410/<420	< 410
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 440	< 430	<410/<420	< 410
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 890	< 870	<820/<840	< 820
4-Chlorophenylphenyl ether	--	--	< 440	< 430	<410/<420	< 410
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
4-Nitroquinoline-1-oxide	--	--	< 4,400	< 4,300	<4,100/<4,200	< 4,100
5-Nitro-o-toluidine	--	--	< 440	< 430	<410/<420	< 410
7,12-Dimethylbenz(a)anthracene	--	--	< 440	< 430	<410/<420	< 410
Acenaphthene	4,700,000	190,000,000	< 440	< 430	<410/<420	< 410
Acenaphthylene	6,900,000	190,000,000	< 440	< 430	<410/<420	< 410
Acetophenone	1,000,000	10,000,000	< 440	< 430	<410/<420	< 410
alpha,alpha-Dimethylphenethylamine	--	--	< 90,000	< 88,000	<84,000/<85,000	< 84,000
Aniline	580	600,000	< 440	< 430	<410/<420	< 410
Anthracene	350,000	190,000,000	< 440	< 430	<410/<420	< 410
Aramite, Total	--	--	< 440	< 430	<410/<420	< 410
Benzo(a)anthracene	320,000	190,000,000	< 440	< 430	<410/<420	< 410
Benzo(a)pyrene	46,000	190,000,000	< 440	< 430	<410/<420	< 410
Benzo(b)fluoranthene	170,000	190,000,000	< 440	< 430	<410/<420	< 410
Benzo(g,h,i)perylene	180,000	190,000,000	< 440	< 430	<410/<420	< 410
Benzo(k)fluoranthene	610,000	190,000,000	< 440	< 430	<410/<420	< 410
Benzyl alcohol	3,100,000	10,000,000	< 440	< 430	<410/<420	< 410
bis(2-Chloroethoxy)methane	--	--	< 440	< 430	<410/<420	< 410
bis(2-Chloroethyl)ether	55	5,700	< 440	< 430	<410/<420	< 410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	LP-1 (15.1-17.1) 12/4/2003	LP-2 (14.7-16.7) 12/11/2003	LP-3 (19.5-21.5) 12/11/2003	LP-4 (14-16) 12/3/2003
Semivolatile Organic Compounds (continued) (ug/kg)						
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 440	140J	300J/430	80J
Butylbenzylphthalate	10,000,000	10,000,000	< 440	< 430	<410/<420	< 410
Chrysene	230,000	190,000,000	< 440	< 430	<410/<420	< 410
Cresol (ortho)	510,000	10,000,000	< 440	< 430	<410/<420	< 410
Cresol, m & p	51,000	190,000,000	< 440	< 430	<410/<420	< 410
Diallate, Total	1,000	110,000	< 440	< 430	<410/<420	< 410
Dibenzo(a,h)anthracene	160,000	190,000,000	< 440	< 430	<410/<420	< 410
Dibenzofuran	--	--	< 440	< 430	<410/<420	< 410
Diethylphthalate	500,000	10,000,000	< 440	< 430	<410/<420	< 410
Dimethoate	2,000	190,000,000	< 440	< 430	<410/<420	< 410
Dimethylphthalate	--	--	< 440	< 430	<410/<420	< 410
Di-n-butylphthalate	4,100,000	10,000,000	< 440	< 430	<410/<420	< 410
Di-n-octylphthalate	10,000,000	10,000,000	< 440	< 430	<410/<420	< 410
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 440	< 430	<410/<420	< 410
Disulfoton	78	8,700	< 440	< 430	<410/<420	< 410
Ethyl methanesulfonate	--	--	< 440	< 430	<410/<420	< 410
Ethyl parathion (Parathion)	360,000	10,000,000	< 440	< 430	<410/<420	< 410
Famphur	--	--	< 440	< 430	<410/<420	< 410
Fluoranthene	3,200,000	190,000,000	< 440	< 430	<410/<420	< 410
Fluorene	3,800,000	190,000,000	< 440	< 430	<410/<420	< 410
Hexachlorobenzene	960	190,000,000	< 440	< 430	<410/<420	< 410
Hexachlorobutadiene	1,200	10,000,000	< 440	< 430	<410/<420	< 410
Hexachlorocyclopentadiene	91,000	10,000,000	< 440	< 430	<410/<420	< 410
Hexachloroethane	560	190,000,000	< 440	< 430	<410/<420	< 410
Hexachlorophene	--	--	< 230,000	< 220,000	<210,000/<220,000	< 210,000
Hexachloropropene	--	--	< 440	< 430	<410/<420	< 410
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 440	< 430	<410/<420	< 410
Isophorone	10,000	10,000,000	< 440	< 430	<410/<420	< 410
Isosafrole	--	--	< 440	< 430	<410/<420	< 410
m-Dinitrobenzene	100	190,000,000	< 440	< 430	<410/<420	< 410
Methapyrilene	--	--	< 90,000	< 88,000	<84,000/<85,000	< 84,000
Methyl methanesulfonate	2,600	190,000,000	< 440	< 430	<410/<420	< 410
Methyl parathion	420	55,000	< 440	< 430	<410/<420	< 410
Naphthalene	25,000	190,000,000	< 440	< 430	<410/<420	< 410
Nitrobenzene	5,100	10,000,000	< 440	< 430	<410/<420	< 410
N-Nitrosodiethylamine	1.3	44	< 440	< 430	<410/<420	< 410
N-Nitrosodimethylamine	1.3	130	< 440	< 430	<410/<420	< 410
N-Nitrosodi-n-butylamine	14	10,000,000	< 440	< 430	<410/<420	< 410
n-Nitrosodi-n-propylamine	37	10,000,000	< 440	< 430	<410/<420	< 410
N-Nitrosodiphenylamine	83,000	190,000,000	< 440	< 430	<410/<420	< 410
N-Nitrosomethylethylamine	--	--	< 440	< 430	<410/<420	< 410
N-Nitrosomorpholine	--	--	< 440	< 430	<410/<420	< 410
N-Nitrosopiperidine	--	--	< 440	< 430	<410/<420	< 410
N-Nitrosopyrrolidine	--	--	< 440	< 430	<410/<420	< 410
O,O,O-Triethyl phosphorothioate	--	--	< 440	< 430	<410/<420	< 410
o-Toluidine	1,200	10,000,000	< 440	< 430	<410/<420	< 410
p-(Dimethylamino)azobenzene	150	190,000,000	< 440	< 430	<410/<420	< 410
Pentachlorobenzene	660,000	190,000,000	< 440	< 430	<410/<420	< 410
Pentachloronitrobenzene	20,000	190,000,000	< 440	< 430	<410/<420	< 410
Pentachlorophenol	5,000	190,000,000	< 2,300	< 2,200	<2,100/<2,200	< 2,100
Phenacetin	120,000	190,000,000	< 440	< 430	<410/<420	< 410
Phenol	400,000	190,000,000	< 440	< 430	<410/<420	< 410
Phenanthrene	10,000,000	190,000,000	< 440	< 430	<410/<420	< 410
Phorate	880	43,000	< 440	< 430	<410/<420	< 410
Pronamide	5,000	190,000,000	< 440	< 430	<410/<420	< 410
Pyrene	2,200,000	190,000,000	< 440	< 430	<410/<420	< 410
Pyridine	2,000	210,000	< 440	< 430	<410/<420	< 410
Safrole	--	--	< 440	< 430	<410/<420	< 410
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 440	< 430	<410/<420	< 410
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 440	< 430	<410/<420	< 410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	LP-1 (15.1-17.1) 12/4/2003	LP-2 (14.7-16.7) 12/11/2003	LP-3 (19.5-21.5) 12/11/2003	LP-4 (14-16) 12/3/2003
Inorganics (mg/kg) [a]						
Antimony	27	190,000	< 2.5	< 2.5	0.8J/ -	< 2.4
Arsenic	150	190,000	10L	9.5K	9K/9.3K	6.2
Barium	8,200	190,000	120	99	130/130	210
Beryllium	320	190,000	0.75	0.87	0.88/0.88	0.84
Cadmium	38	190,000	< 0.64	< 0.63	<0.58/<0.62	0.29J
Chromium	190,000	190,000	18K	15	16/15	25
Cobalt	200	190,000	12K	13	9.6/18	9.5
Copper	36,000	190,000	21	21	21/21	17K
Lead	450	190,000	14L	14L	13L/18L	10K
Mercury	10	190,000	0.02J	0.02J	0.015J/0.025	0.035
Nickel	650	190,000	24	26	27/29	24
Selenium	26	190,000	< 1.3R [l]	< 1.3L	<1.2L/<1.2L	< 1.2
Silver	84	190,000	< 1.3	< 1.3	<1.2/<1.2	< 1.2L
Thallium	14	190,000	< 1.3L	< 1.3	<1.2/	< 1.2
Tin	6,100	190,000	2B	2.3B	1.8B/<2.1B	1.9B
Vanadium	72,000	190,000	25	21	21/21	27
Zinc	12,000	190,000	63J	67	69/68	72K

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	LP-9 (5.6-7.6) 12/8/2003	LP-10 (16-18) 12/4/2003	SB-1 (14-16) 11/25/2003	SB-2 (11.5-13.5) 11/25/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 310	< 5.6	< 5.4	< 5.9
1,1,1-Trichloroethane	20,000	10,000,000	< 310	< 5.6	< 5.4	< 5.9
1,1,2,2-Tetrachloroethane	30	33,000	< 310	< 5.6	< 5.4	< 5.9
1,1,2-Trichloroethane	500	120,000	< 310	< 5.6	< 5.4	< 5.9
1,1-Dichloroethane	11,000	1,200,000	< 310	< 5.6	< 5.4	< 5.9
1,1-Dichloroethene	190	38,000	< 310	< 5.6	< 5.4	< 5.9
1,2,3-Trichloropropane	400,000	950	< 310	< 5.6	< 5.4	< 5.9
1,2,4-Trimethylbenzene	20,000	360,000	1,500	< 5.6	5J	7.6
1,2-Dibromo-3-chloropropane	20	12,000	< 310	< 11	< 11	< 12
1,2-Dibromoethane (EDB)	5	8,600	< 310	< 5.6	< 5.4	< 5.9
1,2-Dichloroethane	500	73,000	< 310	< 5.6	< 5.4	< 5.9
1,2-Dichloropropane	500	180,000	< 310	< 5.6	< 5.4	< 5.9
1,3,5-Trimethylbenzene	6,200	360,000	170J	< 5.6	1.4J	6.6
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 1,600	< 28	< 27	< 30
2-Hexanone	--[d]	--	< 1,600	< 28	< 27	< 30
3-Chloropropene (Allylchloride)	4,100	430,000	< 310	< 5.6	< 5.4	< 5.9
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 1,600	< 28	< 27	< 30
Acetone	1,000,000	10,000,000	1100J	< 56	45J	40J
Acetonitrile	35,000	3,600,000	< 12,000	< 220	< 220	< 240
Acrolein (Propenal)	12	1,200	< 6,200	< 110	< 110	< 120
Acrylonitrile	270	28,000	< 6,200	< 110	< 110	< 120
Benzene	500	240,000	< 310	< 5.6	4.2J	3.6J
Bromodichloromethane	10,000	51,000	< 310	< 5.6	< 5.4	< 5.9
Bromoform	10,000	1,700,000	< 310	< 5.6	< 5.4	< 5.9
Bromomethane (Methyl Bromide)	1,000	300,000	< 310	< 5.6	< 5.4	< 5.9
Carbon disulfide	410,000	10,000,000	< 310	< 5.6	< 5.4	< 5.9
Carbon tetrachloride	500	120,000	< 310	< 5.6	< 5.4	< 5.9
Chlorobenzene	10,000	10,000,000	< 310	< 5.6	11	8
Chloroethane	90,000	10,000,000	< 310	< 5.6	< 5.4	< 5.9
Chloroform	10,000	19,000	< 310	< 5.6	< 5.4	< 5.9
Chloromethane (Methyl Chloride)	300	1,000,000	< 310	< 5.6	< 5.4	< 5.9
Chloroprene	4,100	430,000	< 310	< 5.6	< 5.4	< 5.9
cis-1,2-Dichloroethene	7,000	2,100,000	< 310	< 5.6	< 5.4	< 5.9
cis-1,3-Dichloropropene[c]	2,600	470,000	< 310	< 5.6	< 5.4	< 5.9
Dibromochloromethane	--	--	< 310	< 5.6	< 5.4	< 5.9
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 310	< 5.6	< 5.4	< 5.9
Dichlorodifluoromethane	100,000	10,000,000	< 310	< 5.6	< 5.4	< 5.9
Ethyl methacrylate	180,000	190,000,000	< 310	< 5.6	< 5.4	< 5.9
Ethylbenzene	70,000	10,000,000	700	< 5.6	9.4	4.7J
Iodomethane (Methyl iodide)	--	--	< 310	< 5.6	< 5.4	< 5.9
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 12,000	< 220	< 220	< 240
Methacrylonitrile	410	43,000	< 6,200	< 110	< 110	< 120
Methyl methacrylate	410,000	10,000,000	< 310	< 5.6	< 5.4	< 5.9
Methylene chloride (Dichloromethane)	500	1,000,000	< 310	< 5.6	< 5.4	< 5.9
Pentachloroethane	--	--	< 1,600	< 28	< 27	< 30
Propionitrile	--	--	< 6,200	< 110	< 110	< 120
Styrene	24,000	10,000,000	< 310	< 5.6	< 5.4	< 5.9
Tetrachloroethene	500	3,300,000	< 310	< 5.6	30	21
Toluene	100,000	10,000,000	< 310	< 5.6	2.4J	2.5J
trans-1,2-Dichloroethene	10,000	4,300,000	< 310	< 5.6	< 5.4	< 5.9
trans-1,3-Dichloropropene[c]	2,600	470,000	< 310	< 5.6	< 5.4	< 5.9
trans-1,4-Dichloro-2-butene	7	190,000,000	< 620	< 11	< 11	< 12
Trichloroethene	500	1,100,000	< 310	< 5.6	14	12
Trichlorofluoromethane	--	--	< 310	< 5.6	< 5.4	< 5.9
Vinyl acetate	120,000	10,000,000	< 620	< 11	< 11	< 12
Vinyl chloride	200	220,000	< 310	< 5.6	< 5.4	< 5.9
Xylenes, Total	1,000,000	10,000,000	670	< 11	12	14

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	LP-9 (5.6-7.6) 12/8/2003	LP-10 (16-18) 12/4/2003	SB-1 (14-16) 11/25/2003	SB-2 (11.5-13.5) 11/25/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 470	< 410	< 410	< 450
1,2,4-Trichlorobenzene	27,000	10,000,000	< 470	< 410	< 410	< 450
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 470	< 410	< 410	< 450
1,3,5-Trinitrobenzene	--	--	< 470	< 410	< 410	< 450
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 470	< 410	< 410	< 450
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 470	< 410	< 410	< 450
1,4-Dioxane	2,400	240,000	< 470	< 410	< 410	< 450
1,4-Naphthoquinone	--	--	< 470	< 410	< 410	< 450
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,400	< 2,100	< 2,100	< 2,300
1-Naphthylamine	1,100	190,000,000	< 470	< 410	< 410	< 450
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 470	< 410	< 410	< 450
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 470	< 410	< 410	< 450
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 470	< 410	< 410	< 450
2,4,6-Trichlorophenol	8,900	190,000,000	< 470	< 410	< 410	< 450
2,4-Dichlorophenol	2,000	190,000,000	< 470	< 410	< 410	< 450
2,4-Dimethylphenol	200,000	10,000,000	< 470	< 410	< 410	< 450
2,4-Dinitrophenol	4,100	190,000,000	< 2,400	< 2,100	< 2,100	< 2,300
2,4-Dinitrotoluene	840	190,000,000	< 470	< 410	< 410	< 450
2,6-Dichlorophenol	--	--	< 470	< 410	< 410	< 450
2,6-Dinitrotoluene	10,000	190,000,000	< 470	< 410	< 410	< 450
2-Acetylaminofluorene	280	190,000,000	< 470	< 410	< 410	< 450
2-Chloronaphthalene	18,000,000	190,000,000	< 470	< 410	< 410	< 450
2-Chlorophenol	4,400	1,100,000	< 470	< 410	< 410	< 450
2-Methylnaphthalene	8,000,000	10,000,000	57J	< 410	2,000	< 450
2-Naphthylamine	140	190,000,000	< 470	< 410	< 410	< 450
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,400	< 2,100	< 2,100	< 2,300
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 470	< 410	< 410	< 450
2-Picoline	--	--	< 470	< 410	< 410	< 450
3,3'-Dichlorobenzidine	32,000	190,000,000	< 940	< 820	< 820	< 900
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,400	< 2,100	< 2,100	< 2,300
3-Methylcholanthrene	--	--	< 470	< 410	< 410	< 450
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,400	< 2,100	< 2,100	< 2,300
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,400	< 2,100	< 2,100	< 2,300
4-Aminobiphenyl	12	190,000,000	< 470	< 410	< 410	< 450
4-Bromophenylphenyl ether	--	--	< 470	< 410	< 410	< 450
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 470	< 410	< 410	< 450
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 940	< 820	< 820	< 900
4-Chlorophenylphenyl ether	--	--	< 470	< 410	< 410	< 450
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,400	< 2,100	< 2,100	< 2,300
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,400	< 2,100	< 2,100	< 2,300
4-Nitroquinoline-1-oxide	--	--	< 4,700	< 4,100	< 4,100	< 4,500
5-Nitro-o-toluidine	--	--	< 470	< 410	< 410	< 450
7,12-Dimethylbenz(a)anthracene	--	--	< 470	< 410	< 410	< 450
Acenaphthene	4,700,000	190,000,000	< 470	< 410	< 410	< 450
Acenaphthylene	6,900,000	190,000,000	< 470	< 410	< 410	< 450
Acetophenone	1,000,000	10,000,000	< 470	< 410	< 410	< 450
alpha,alpha-Dimethylphenethylamine	--	--	< 96,000	< 84,000	< 84,000	< 92,000
Aniline	580	600,000	< 470	< 410	< 410	< 450
Anthracene	350,000	190,000,000	47J	< 410	< 410	< 450
Aramite, Total	--	--	< 470	< 410	< 410	< 450
Benzo(a)anthracene	320,000	190,000,000	100J	< 410	75J	< 450
Benzo(a)pyrene	46,000	190,000,000	80J	< 410	95J	68J
Benzo(b)fluoranthene	170,000	190,000,000	70J	< 410	85J	56J
Benzo(g,h,i)perylene	180,000	190,000,000	64J	< 410	65J	74J
Benzo(k)fluoranthene	610,000	190,000,000	96J	< 410	94J	82J
Benzyl alcohol	3,100,000	10,000,000	< 470	< 410	< 410	< 450
bis(2-Chloroethoxy)methane	--	--	< 470	< 410	< 410	< 450
bis(2-Chloroethyl)ether	55	5,700	< 470	< 410	< 410	< 450

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	LP-9 (5.6-7.6) 12/8/2003	LP-10 (16-18) 12/4/2003	SB-1 (14-16) 11/25/2003	SB-2 (11.5-13.5) 11/25/2003
Semivolatile Organic Compounds (continued) (ug/kg)						
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	510B	< 410	160J	< 450
Butylbenzylphthalate	10,000,000	10,000,000	< 470	< 410	< 410	< 450
Chrysene	230,000	190,000,000	120J	< 410	77J	< 450
Cresol (ortho)	510,000	10,000,000	< 470	< 410	< 410	< 450
Cresol, m & p	51,000	190,000,000	< 470	< 410	< 410	< 450
Diallate, Total	1,000	110,000	< 470	< 410	< 410	< 450
Dibenzo(a,h)anthracene	160,000	190,000,000	< 470	< 410	52J	61J
Dibenzofuran	--	--	< 470	< 410	< 410	< 450
Diethylphthalate	500,000	10,000,000	< 470	< 410	< 410	< 450
Dimethoate	2,000	190,000,000	< 470	< 410	< 410	< 450
Dimethylphthalate	--	--	< 470	< 410	< 410	< 450
Di-n-butylphthalate	4,100,000	10,000,000	< 470	< 410	150J	120J
Di-n-octylphthalate	10,000,000	10,000,000	< 470	< 410	< 410	< 450
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 470	< 410	< 410	< 450
Disulfoton	78	8,700	< 470	< 410	< 410	< 450
Ethyl methanesulfonate	--	--	< 470	< 410	< 410	< 450
Ethyl parathion (Parathion)	360,000	10,000,000	< 470	< 410	< 410	< 450
Famphur	--	--	< 470	< 410	< 410	< 450
Fluoranthene	3,200,000	190,000,000	210J	< 410	98J	42J
Fluorene	3,800,000	190,000,000	37J	< 410	160J	< 450
Hexachlorobenzene	960	190,000,000	< 470	< 410	< 410	< 450
Hexachlorobutadiene	1,200	10,000,000	< 470	< 410	< 410	< 450
Hexachlorocyclopentadiene	91,000	10,000,000	< 470	< 410	< 410	< 450
Hexachloroethane	560	190,000,000	< 470	< 410	< 410	< 450
Hexachlorophene	--	--	< 240,000	< 210,000	< 210,000	< 230,000
Hexachloropropene	--	--	< 470	< 410	< 410	< 450
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	55J	< 410	52J	56J
Isophorone	10,000	10,000,000	< 470	< 410	< 410	< 450
Isosafrole	--	--	< 470	< 410	< 410	< 450
m-Dinitrobenzene	100	190,000,000	< 470	< 410	< 410	< 450
Methapyrilene	--	--	< 96,000	< 84,000	< 84,000	< 92,000
Methyl methanesulfonate	2,600	190,000,000	< 470	< 410	< 410	< 450
Methyl parathion	420	55,000	< 470	< 410	< 410	< 450
Naphthalene	25,000	190,000,000	250J	< 410	360J	< 450
Nitrobenzene	5,100	10,000,000	< 470	< 410	< 410	< 450
N-Nitrosodiethylamine	1.3	44	< 470	< 410	< 410	< 450
N-Nitrosodimethylamine	1.3	130	< 470	< 410	< 410	< 450
N-Nitrosodi-n-butylamine	14	10,000,000	< 470	< 410	< 410	< 450
n-Nitrosodi-n-propylamine	37	10,000,000	< 470	< 410	< 410	< 450
N-Nitrosodiphenylamine	83,000	190,000,000	< 470	< 410	< 410	< 450
N-Nitrosomethylethylamine	--	--	< 470	< 410	< 410	< 450
N-Nitrosomorpholine	--	--	< 470	< 410	< 410	< 450
N-Nitrosopiperidine	--	--	< 470	< 410	< 410	< 450
N-Nitrosopyrrolidine	--	--	< 470	< 410	< 410	< 450
O,O,O-Triethyl phosphorothioate	--	--	< 470	< 410	< 410	< 450
o-Toluidine	1,200	10,000,000	< 470	< 410	< 410	< 450
p-(Dimethylamino)azobenzene	150	190,000,000	< 470	< 410	< 410	< 450
Pentachlorobenzene	660,000	190,000,000	< 470	< 410	< 410	< 450
Pentachloronitrobenzene	20,000	190,000,000	< 470	< 410	< 410	< 450
Pentachlorophenol	5,000	190,000,000	< 2,400	< 2,100	< 2,100	< 2,300
Phenacetin	120,000	190,000,000	< 470	< 410	< 410	< 450
Phenol	400,000	190,000,000	< 470	< 410	< 410	< 450
Phenanthrene	10,000,000	190,000,000	210J	< 410	180J	< 450
Phorate	880	43,000	< 470	< 410	< 410	< 450
Pronamide	5,000	190,000,000	< 470	< 410	< 410	< 450
Pyrene	2,200,000	190,000,000	150J	< 410	78J	38J
Pyridine	2,000	210,000	< 470	< 410	< 410	< 450
Safrole	--	--	< 470	< 410	< 410	< 450
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 470	< 410	< 410	< 450
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 470	< 410	< 410	< 450

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	LP-9 (5.6-7.6) 12/8/2003	LP-10 (16-18) 12/4/2003	SB-1 (14-16) 11/25/2003	SB-2 (11.5-13.5) 11/25/2003
Inorganics (mg/kg) [a]						
Antimony	27	190,000	< 2.5	< 2.4	< 2.4L	< 2.5
Arsenic	150	190,000	19L	8.6L	9.5L	14L
Barium	8,200	190,000	120	160	130	150
Beryllium	320	190,000	1.4	1.2	0.89	1.1
Cadmium	38	190,000	< 0.62	< 0.59	0.11J	0.96
Chromium	190,000	190,000	16K	21K	17	17
Cobalt	200	190,000	11K	8.8K	13	14
Copper	36,000	190,000	39	18	22	26
Lead	450	190,000	64L	15L	15L	73L
Mercury	10	190,000	0.27	0.036	0.036	0.19
Nickel	650	190,000	22	20	21	21
Selenium	26	190,000	< 1.2R	< 1.2R	< 1.2L	< 1.3L
Silver	84	190,000	< 1.2	< 1.2	< 1.2	< 1.3
Thallium	14	190,000	< 1.2L	< 1.2L	< 1.2	< 1.3
Tin	6,100	190,000	7.9B	2.6B	2.8B	18
Vanadium	72,000	190,000	19	30	23	24
Zinc	12,000	190,000	110	63J	66	120

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	SB-3 (14-16) 11/25/2003	SB-4 (8-10) 11/25/2003	SB-5 (12-14) 11/25/2003	SB-6 (11-13) 11/25/2003	TF-1 (9.7-11.7) 12/8/2003
Volatile Organic Compounds (ug/kg) [a]							
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,1,1-Trichloroethane	20,000	10,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,1,2,2-Tetrachloroethane	30	33,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,1,2-Trichloroethane	500	120,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,1-Dichloroethane	11,000	1,200,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,1-Dichloroethene	190	38,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,2,3-Trichloropropane	400,000	950	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,2,4-Trimethylbenzene	20,000	360,000	1.3	21	< 5.4	< 5.4	< 5.6
1,2-Dibromo-3-chloropropane	20	12,000	< 10	< 10	< 11	< 11	< 11
1,2-Dibromoethane (EDB)	5	8,600	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,2-Dichloroethane	500	73,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,2-Dichloropropane	500	180,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
1,3,5-Trimethylbenzene	6,200	360,000	< 5.1	18	< 5.4	< 5.4	< 5.6
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	5.7J	< 26	< 27	5.6J	< 28
2-Hexanone	-- [d]	--	< 25	< 26	< 27	< 27	< 28
3-Chloropropene (Allylchloride)	4,100	430,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 25	< 26	< 27	< 27	< 28
Acetone	1,000,000	10,000,000	41J	35J	30J	65	31J
Acetonitrile	35,000	3,600,000	< 200	< 210	< 220	< 220	< 220
Acrolein (Propenal)	12	1,200	< 100	< 100	< 110	< 110	< 110
Acrylonitrile	270	28,000	< 100	< 100	< 110	< 110	< 110
Benzene	500	240,000	4.7J	3.3J	1.8J	< 5.4	2.7J
Bromodichloromethane	10,000	51,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Bromoform	10,000	1,700,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Bromomethane (Methyl Bromide)	1,000	300,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Carbon disulfide	410,000	10,000,000	< 5.1	< 5.2	3J	< 5.4	< 5.6
Carbon tetrachloride	500	120,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Chlorobenzene	10,000	10,000,000	11	8.4	4.2J	< 5.4	< 5.6
Chloroethane	90,000	10,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Chloroform	10,000	19,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Chloromethane (Methyl Chloride)	300	1,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Chloroprene	4,100	430,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
cis-1,2-Dichloroethene	7,000	2,100,000	< 5.1	1.2J	< 5.4	< 5.4	< 5.6
cis-1,3-Dichloropropene [e]	2,600	470,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Dibromochloromethane	--	--	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Dichlorodifluoromethane	100,000	10,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Ethyl methacrylate	180,000	190,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Ethylbenzene	70,000	10,000,000	4J	14	< 5.4	< 5.4	1.4J
Iodomethane (Methyl iodide)	--	--	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 200	< 210	< 220	< 220	< 220
Methacrylonitrile	410	43,000	< 100	< 100	< 110	< 110	< 110
Methyl methacrylate	410,000	10,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Methylene chloride (Dichloromethane)	500	1,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Pentachloroethane	--	--	< 25	< 26	< 27	< 27	< 28
Propionitrile	--	--	< 100	< 100	< 110	< 110	< 110
Styrene	24,000	10,000,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Tetrachloroethene	500	3,300,000	22	23	11	< 5.4	< 5.6
Toluene	100,000	10,000,000	12	6.4	< 5.4	< 5.4	4.8J
trans-1,2-Dichloroethene	10,000	4,300,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
trans-1,3-Dichloropropene [e]	2,600	470,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
trans-1,4-Dichloro-2-butene	7	190,000,000	< 10	< 10	< 11	< 11	< 11
Trichloroethene	500	1,100,000	21	12	6	< 5.4	< 5.6
Trichlorofluoromethane	--	--	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Vinyl acetate	120,000	10,000,000	< 10	< 10	< 11	< 11	< 11
Vinyl chloride	200	220,000	< 5.1	< 5.2	< 5.4	< 5.4	< 5.6
Xylenes, Total	1,000,000	10,000,000	16	25	3.3J	< 11	< 11

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	SB-3 (14-16) 11/25/2003	SB-4 (8-10) 11/25/2003	SB-5 (12-14) 11/25/2003	SB-6 (11-13) 11/25/2003	TF-1 (9.7-11.7) 12/8/2003
Semivolatile Organic Compounds (ug/kg)							
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 400	< 410	< 420	< 430	< 410
1,2,4-Trichlorobenzene	27,000	10,000,000	< 400	< 410	< 420	< 430	< 410
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 400	< 410	< 420	< 430	< 410
1,3,5-Trinitrobenzene	--	--	< 400	< 410	< 420	< 430	< 410
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 400	< 410	< 420	< 430	< 410
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 400	< 410	< 420	< 430	< 410
1,4-Dioxane	2,400	240,000	< 400	< 410	< 420	< 430	< 410
1,4-Naphthoquinone	--	--	< 400	< 410	< 420	< 430	< 410
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
1-Naphthylamine	1,100	190,000,000	< 400	< 410	< 420	< 430	< 410
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 400	< 410	< 420	< 430	< 410
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 400	< 410	< 420	< 430	< 410
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 400	< 410	< 420	< 430	< 410
2,4,6-Trichlorophenol	8,900	190,000,000	< 400	< 410	< 420	< 430	< 410
2,4-Dichlorophenol	2,000	190,000,000	< 400	< 410	< 420	< 430	< 410
2,4-Dimethylphenol	200,000	10,000,000	< 400	< 410	< 420	< 430	< 410
2,4-Dinitrophenol	4,100	190,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
2,4-Dinitrotoluene	840	190,000,000	< 400	< 410	< 420	< 430	< 410
2,6-Dichlorophenol	--	--	< 400	< 410	< 420	< 430	< 410
2,6-Dinitrotoluene	10,000	190,000,000	< 400	< 410	< 420	< 430	< 410
2-Acetylaminofluorene	280	190,000,000	< 400	< 410	< 420	< 430	< 410
2-Chloronaphthalene	18,000,000	190,000,000	< 400	< 410	< 420	< 430	< 410
2-Chlorophenol	4,400	1,100,000	< 400	< 410	< 420	< 430	< 410
2-Methylnaphthalene	8,000,000	10,000,000	< 400	< 410	< 420	< 430	< 410
2-Naphthylamine	140	190,000,000	< 400	< 410	< 420	< 430	< 410
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 400	< 410	< 420	< 430	< 410
2-Picoline	--	--	< 400	< 410	< 420	< 430	< 410
3,3'-Dichlorobenzidine	32,000	190,000,000	< 800	< 820	< 840	< 870	< 820
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
3-Methylcholanthrene	--	--	< 400	< 410	< 420	< 430	< 410
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
4-Aminobiphenyl	12	190,000,000	< 400	< 410	< 420	< 430	< 410
4-Bromophenylphenyl ether	--	--	< 400	< 410	< 420	< 430	< 410
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 400	< 410	< 420	< 430	< 410
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 800	< 820	< 840	< 870	< 820
4-Chlorophenylphenyl ether	--	--	< 400	< 410	< 420	< 430	< 410
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
4-Nitroquinoline-1-oxide	--	--	< 4,000	< 4,100	< 4,200	< 4,300	< 4,100
5-Nitro-o-toluidine	--	--	< 400	< 410	< 420	< 430	< 410
7,12-Dimethylbenz(a)anthracene	--	--	< 400	< 410	< 420	< 430	< 410
Acenaphthene	4,700,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Acenaphthylene	6,900,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Acetophenone	1,000,000	10,000,000	< 400	< 410	< 420	< 430	< 410
alpha,alpha-Dimethylphenethylamine	--	--	< 82,000	< 84,000	< 85,000	< 88,000	< 84,000
Aniline	580	600,000	< 400	< 410	< 420	< 430	< 410
Anthracene	350,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Aramite, Total	--	--	< 400	< 410	< 420	< 430	< 410
Benzo(a)anthracene	320,000	190,000,000	< 400	72J	< 420	< 430	< 410
Benzo(a)pyrene	46,000	190,000,000	< 400	64J	< 420	< 430	89J
Benzo(b)fluoranthene	170,000	190,000,000	< 400	< 410	< 420	< 430	68J
Benzo(g,h,i)perylene	180,000	190,000,000	< 400	58J	< 420	< 430	150J
Benzo(k)fluoranthene	610,000	190,000,000	< 400	< 410	< 420	< 430	78J
Benzyl alcohol	3,100,000	10,000,000	< 400	< 410	< 420	< 430	< 410
bis(2-Chloroethoxy)methane	--	--	< 400	< 410	< 420	< 430	< 410
bis(2-Chloroethyl)ether	55	5,700	< 400	< 410	< 420	< 430	< 410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	SB-3 (14-16) 11/25/2003	SB-4 (8-10) 11/25/2003	SB-5 (12-14) 11/25/2003	SB-6 (11-13) 11/25/2003	TF-1 (9.7-11.7) 12/8/2003
Semivolatile Organic Compounds (continued) (ug/kg)							
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 400	< 410	< 420	< 430	510B
Butylbenzylphthalate	10,000,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Chrysene	230,000	190,000,000	< 400	65J	< 420	< 430	< 410
Cresol (ortho)	510,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Cresol, m & p	51,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Diallate, Total	1,000	110,000	< 400	< 410	< 420	< 430	< 410
Dibenzo(a,h)anthracene	160,000	190,000,000	< 400	< 410	< 420	< 430	160J
Dibenzofuran	--	--	< 400	< 410	< 420	< 430	< 410
Diethylphthalate	500,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Dimethoate	2,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Dimethylphthalate	--	--	< 400	< 410	< 420	< 430	< 410
Di-n-butylphthalate	4,100,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Di-n-octylphthalate	10,000,000	10,000,000	< 400	< 410	< 420	< 430	46J
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 400	< 410	< 420	< 430	< 410
Disulfoton	78	8,700	< 400	< 410	< 420	< 430	< 410
Ethyl methanesulfonate	--	--	< 400	< 410	< 420	< 430	< 410
Ethyl parathion (Parathion)	360,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Famphur	--	--	< 400	< 410	< 420	< 430	< 410
Fluoranthene	3,200,000	190,000,000	< 400	150J	< 420	< 430	< 410
Fluorene	3,800,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Hexachlorobenzene	960	190,000,000	< 400	< 410	< 420	< 430	< 410
Hexachlorobutadiene	1,200	10,000,000	< 400	< 410	< 420	< 430	< 410
Hexachlorocyclopentadiene	91,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Hexachloroethane	560	190,000,000	< 400	< 410	< 420	< 430	< 410
Hexachlorophene	--	--	< 210,000	< 210,000	< 220,000	< 220,000	< 210,000
Hexachloropropene	--	--	< 400	< 410	< 420	< 430	< 410
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 400	38J	< 420	< 430	120J
Isophorone	10,000	10,000,000	< 400	< 410	< 420	< 430	< 410
Isosafrole	--	--	< 400	< 410	< 420	< 430	< 410
m-Dinitrobenzene	100	190,000,000	< 400	< 410	< 420	< 430	< 410
Methapyrilene	--	--	< 82,000	< 84,000	< 85,000	< 88,000	< 84,000
Methyl methanesulfonate	2,600	190,000,000	< 400	< 410	< 420	< 430	< 410
Methyl parathion	420	55,000	< 400	< 410	< 420	< 430	< 410
Naphthalene	25,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Nitrobenzene	5,100	10,000,000	< 400	< 410	< 420	< 430	< 410
N-Nitrosodiethylamine	1.3	44	< 400	< 410	< 420	< 430	< 410
N-Nitrosodimethylamine	1.3	130	< 400	< 410	< 420	< 430	< 410
N-Nitrosodi-n-butylamine	14	10,000,000	< 400	< 410	< 420	< 430	< 410
n-Nitrosodi-n-propylamine	37	10,000,000	< 400	< 410	< 420	< 430	< 410
N-Nitrosodiphenylamine	83,000	190,000,000	< 400	< 410	< 420	< 430	< 410
N-Nitrosomethylethylamine	--	--	< 400	< 410	< 420	< 430	< 410
N-Nitrosomorpholine	--	--	< 400	< 410	< 420	< 430	< 410
N-Nitrosopiperidine	--	--	< 400	< 410	< 420	< 430	< 410
N-Nitrosopyrrolidine	--	--	< 400	< 410	< 420	< 430	< 410
O,O,O-Triethyl phosphorothioate	--	--	< 400	< 410	< 420	< 430	< 410
o-Toluidine	1,200	10,000,000	< 400	< 410	< 420	< 430	< 410
p-(Dimethylamino)azobenzene	150	190,000,000	< 400	< 410	< 420	< 430	< 410
Pentachlorobenzene	660,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Pentachloronitrobenzene	20,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Pentachlorophenol	5,000	190,000,000	< 2,100	< 2,100	< 2,200	< 2,200	< 2,100
Phenacetin	120,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Phenol	400,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Phenanthrene	10,000,000	190,000,000	< 400	130J	< 420	< 430	< 410
Phorate	880	43,000	< 400	< 410	< 420	< 430	< 410
Pronamide	5,000	190,000,000	< 400	< 410	< 420	< 430	< 410
Pyrene	2,200,000	190,000,000	< 400	140J	< 420	< 430	< 410
Pyridine	2,000	210,000	< 400	< 410	< 420	< 430	< 410
Safrole	--	--	< 400	< 410	< 420	< 430	< 410
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 400	< 410	< 420	< 430	< 410
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 400	< 410	< 420	< 430	< 410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	SB-3 (14-16) 11/25/2003	SB-4 (8-10) 11/25/2003	SB-5 (12-14) 11/25/2003	SB-6 (11-13) 11/25/2003	TF-1 (9.7-11.7) 12/8/2003
Inorganics (mg/kg) [a]							
Antimony	27	190,000	< 2.2	< 2.2	< 2.4	< 2.4	< 2.4
Arsenic	150	190,000	7.6L	10L	23L	9.2L	7.9L
Barium	8,200	190,000	180	110	130	140	100
Beryllium	320	190,000	1.1	1	2.1	1.2	0.81
Cadmium	38	190,000	0.087J	0.16J	0.22J	0.16J	< 0.6
Chromium	190,000	190,000	16	34	29	23	17K
Cobalt	200	190,000	14	10	14	14	11K
Copper	36,000	190,000	16	22	17	20	23
Lead	450	190,000	14L	17L	27L	22L	13L
Mercury	10	190,000	0.035	0.015J	0.044	0.034	0.025
Nickel	650	190,000	24	21	23	24	20
Selenium	26	190,000	< 1.1L	< 1.1L	< 1.2L	< 1.2L	< 1.2R
Silver	84	190,000	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2
Thallium	14	190,000	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2L
Tin	6,100	190,000	2.4B	3B	2.5B	3.2B	2B
Vanadium	72,000	190,000	22	29	42	27	21
Zinc	12,000	190,000	61	71	64	85	63

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	TF-2 (6-8) 12/12/2003	TF-3 (7.4-9.4) 12/8/2003	TF-4 (4-6) 12/12/2003	TF-5 (7.7-9.7) 12/8/2003	TF-6 (14-16) 12/8/2003
Volatile Organic Compounds (ug/kg) [a]							
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,1,1-Trichloroethane	20,000	10,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,1,2,2-Tetrachloroethane	30	33,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,1,2-Trichloroethane	500	120,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,1-Dichloroethane	11,000	1,200,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,1-Dichloroethene	190	38,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,2,3-Trichloropropane	400,000	950	< 5.7	< 5	< 5.8	< 210	< 4.9
1,2,4-Trimethylbenzene	20,000	360,000	< 5.7	< 5	54	30,000	9.1
1,2-Dibromo-3-chloropropane	20	12,000	< 11	< 5	< 12	< 420	< 9.9
1,2-Dibromoethane (EDB)	5	8,600	< 5.7	< 5	< 5.8	< 210	< 4.9
1,2-Dichloroethane	500	73,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,2-Dichloropropane	500	180,000	< 5.7	< 5	< 5.8	< 210	< 4.9
1,3,5-Trimethylbenzene	6,200	360,000	< 5.7	< 5	< 5.8	5,200	9.6
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 28	< 25	20J	< 1,000	< 25
2-Hexanone	-- [d]	--	< 28	< 25	< 29	< 1,000	< 25
3-Chloropropene (Allylchloride)	4,100	430,000	< 5.7	< 5	< 5.8	< 210	< 4.9
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 28	< 25	< 29	< 1,000	< 25
Acetone	1,000,000	10,000,000	< 57	< 50	120	760J	22J
Acetonitrile	35,000	3,600,000	< 230	< 200	< 230	< 8,400	< 200
Acrolein (Propenal)	12	1,200	< 110	< 100	< 120	< 4,200	< 99
Acrylonitrile	270	28,000	< 110	< 100	< 120	< 4,200	< 99
Benzene	500	240,000	< 5.7	< 5	11	170J	15
Bromodichloromethane	10,000	51,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Bromoform	10,000	1,700,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Bromomethane (Methyl Bromide)	1,000	300,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Carbon disulfide	410,000	10,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Carbon tetrachloride	500	120,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Chlorobenzene	10,000	10,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Chloroethane	90,000	10,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Chloroform	10,000	19,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Chloromethane (Methyl Chloride)	300	1,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Chloroprene	4,100	430,000	< 5.7	< 5	< 5.8	< 210	< 4.9
cis-1,2-Dichloroethene	7,000	2,100,000	< 5.7	< 5	< 5.8	< 210	< 4.9
cis-1,3-Dichloropropene [c]	2,600	470,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Dibromochloromethane	--	--	< 5.7	< 5	< 5.8	< 210	< 4.9
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Dichlorodifluoromethane	100,000	10,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Ethyl methacrylate	180,000	190,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Ethylbenzene	70,000	10,000,000	< 5.7	< 5	40	880	5.9
Iodomethane (Methyl iodide)	--	--	< 5.7	< 5	< 5.8	< 210	< 4.9
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 230	< 200	< 230	< 8,400	< 200
Methacrylonitrile	410	43,000	< 110	< 100	< 120	< 4,200	< 99
Methyl methacrylate	410,000	10,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Methylene chloride (Dichloromethane)	500	1,000,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Pentachloroethane	--	--	< 28	< 25	< 29	< 1,000	< 25
Propionitrile	--	--	< 110	< 100	< 120	< 4,200	< 99
Styrene	24,000	10,000,000	< 5.7	< 5	< 5.8	1,100	8.2
Tetrachloroethene	500	3,300,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Toluene	100,000	10,000,000	< 5.7	< 5	2.8J	880	16
trans-1,2-Dichloroethene	10,000	4,300,000	< 5.7	< 5	< 5.8	< 210	< 4.9
trans-1,3-Dichloropropene [c]	2,600	470,000	< 5.7	< 5	< 5.8	< 210	< 4.9
trans-1,4-Dichloro-2-butene	7	190,000,000	< 11	< 10	< 12	< 420	< 9.9
Trichloroethene	500	1,100,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Trichlorofluoromethane	--	--	< 5.7	< 5	< 5.8	< 210	< 4.9
Vinyl acetate	120,000	10,000,000	< 11	< 10	< 12	< 420	< 9.9
Vinyl chloride	200	220,000	< 5.7	< 5	< 5.8	< 210	< 4.9
Xylenes, Total	1,000,000	10,000,000	< 11	< 10	23	7,100	100

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	TF-2 (6-8) 12/12/2003	TF-3 (7.4-9.4) 12/8/2003	TF-4 (4-6) 12/12/2003	TF-5 (7.7-9.7) 12/8/2003	TF-6 (14-16) 12/8/2003
Semivolatile Organic Compounds (ug/kg)							
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 410	< 410	< 430	< 410	< 420
1,2,4-Trichlorobenzene	27,000	10,000,000	< 410	< 410	< 430	< 410	< 420
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 410	< 410	< 430	< 410	< 420
1,3,5-Trinitrobenzene	--	--	< 410	< 410	< 430	< 410	< 420
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 410	< 410	< 430	< 410	< 420
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 410	< 410	< 430	< 410	< 420
1,4-Dioxane	2,400	240,000	< 410	< 410	< 430	< 410	< 420
1,4-Naphthoquinone	--	--	< 410	< 410	< 430	< 410	< 420
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
1-Naphthylamine	1,100	190,000,000	< 410	< 410	< 430	< 410	< 420
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 410	< 410	< 430	< 410	< 420
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 410	< 410	< 430	< 410	< 420
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 410	< 410	< 430	< 410	< 420
2,4,6-Trichlorophenol	8,900	190,000,000	< 410	< 410	< 430	< 410	< 420
2,4-Dichlorophenol	2,000	190,000,000	< 410	< 410	< 430	< 410	< 420
2,4-Dimethylphenol	200,000	10,000,000	< 410	< 410	< 430	< 410	< 420
2,4-Dinitrophenol	4,100	190,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
2,4-Dinitrotoluene	840	190,000,000	< 410	< 410	< 430	< 410	< 420
2,6-Dichlorophenol	--	--	< 410	< 410	< 430	< 410	< 420
2,6-Dinitrotoluene	10,000	190,000,000	< 410	< 410	< 430	< 410	< 420
2-Acetylaminofluorene	280	190,000,000	< 410	< 410	< 430	< 410	< 420
2-Chloronaphthalene	18,000,000	190,000,000	< 410	< 410	< 430	< 410	< 420
2-Chlorophenol	4,400	1,100,000	< 410	< 410	< 430	< 410	< 420
2-Methylnaphthalene	8,000,000	10,000,000	< 410	< 410	< 430	< 410	120J
2-Naphthylamine	140	190,000,000	< 410	< 410	< 430	< 410	< 420
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 410	< 410	< 430	< 410	< 420
2-Picoline	--	--	< 410	< 410	< 430	< 410	< 420
3,3'-Dichlorobenzidine	32,000	190,000,000	< 820	< 810	< 860	< 810	< 840
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
3-Methylcholanthrene	--	--	< 410	< 410	< 430	< 410	< 420
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
4-Aminobiphenyl	12	190,000,000	< 410	< 410	< 430	< 410	< 420
4-Bromophenylphenyl ether	--	--	< 410	< 410	< 430	< 410	< 420
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 410	< 410	< 430	< 410	< 420
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 820	< 810	< 860	< 810	< 840
4-Chlorophenylphenyl ether	--	--	< 410	< 410	< 430	< 410	< 420
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
4-Nitroquinoline-1-oxide	--	--	< 4,100	< 4,100	< 4,300	< 4,100	< 4,200
5-Nitro-o-toluidine	--	--	< 410	< 410	< 430	< 410	< 420
7,12-Dimethylbenz(a)anthracene	--	--	< 410	< 410	< 430	< 410	< 420
Acenaphthene	4,700,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Acenaphthylene	6,900,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Acetophenone	1,000,000	10,000,000	< 410	< 410	< 430	< 410	< 420
alpha,alpha-Dimethylphenethylamine	--	--	< 84,000	< 83,000	< 87,000	< 83,000	< 85,000
Aniline	580	600,000	< 410	< 410	< 430	< 410	< 420
Anthracene	350,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Aramite, Total	--	--	< 410	< 410	< 430	< 410	< 420
Benzo(a)anthracene	320,000	190,000,000	< 410	< 410	250J	< 410	< 420
Benzo(a)pyrene	46,000	190,000,000	< 410	< 410	250J	< 410	< 420
Benzo(b)fluoranthene	170,000	190,000,000	< 410	< 410	280J	< 410	< 420
Benzo(g,h,i)perylene	180,000	190,000,000	< 410	< 410	150J	56J	39J
Benzo(k)fluoranthene	610,000	190,000,000	< 410	< 410	230J	< 410	< 420
Benzyl alcohol	3,100,000	10,000,000	< 410	< 410	< 430	< 410	< 420
bis(2-Chloroethoxy)methane	--	--	< 410	< 410	< 430	< 410	< 420
bis(2-Chloroethyl)ether	55	5,700	< 410	< 410	< 430	< 410	< 420

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	TF-2 (6-8) 12/12/2003	TF-3 (7.4-9.4) 12/8/2003	TF-4 (4-6) 12/12/2003	TF-5 (7.7-9.7) 12/8/2003	TF-6 (14-16) 12/8/2003
Semivolatile Organic Compounds (continued) (ug/kg)							
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 410	390B	< 430	260B	430B
Butylbenzylphthalate	10,000,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Chrysene	230,000	190,000,000	< 410	< 410	300J	< 410	< 420
Cresol (ortho)	510,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Cresol, m & p	51,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Diallate, Total	1,000	110,000	< 410	< 410	< 430	< 410	< 420
Dibenzo(a,h)anthracene	160,000	190,000,000	< 410	< 410	< 430	51J	< 420
Dibenzofuran	--	--	< 410	< 410	< 430	< 410	< 420
Diethylphthalate	500,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Dimethoate	2,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Dimethylphthalate	--	--	< 410	< 410	< 430	< 410	< 420
Di-n-butylphthalate	4,100,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Di-n-octylphthalate	10,000,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 410	< 410	< 430	< 410	< 420
Disulfoton	78	8,700	< 410	< 410	< 430	< 410	< 420
Ethyl methanesulfonate	--	--	< 410	< 410	< 430	< 410	< 420
Ethyl parathion (Parathion)	360,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Famphur	--	--	< 410	< 410	< 430	< 410	< 420
Fluoranthene	3,200,000	190,000,000	< 410	< 410	520	< 410	< 420
Fluorene	3,800,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Hexachlorobenzene	960	190,000,000	< 410	< 410	< 430	< 410	< 420
Hexachlorobutadiene	1,200	10,000,000	< 410	< 410	< 430	< 410	< 420
Hexachlorocyclopentadiene	91,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Hexachloroethane	560	190,000,000	< 410	< 410	< 430	< 410	< 420
Hexachlorophene	--	--	< 210,000	< 210,000	< 220,000	< 210,000	< 220,000
Hexachloropropene	--	--	< 410	< 410	< 430	< 410	< 420
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 410	< 410	160J	41J	32J
Isophorone	10,000	10,000,000	< 410	< 410	< 430	< 410	< 420
Isosafrole	--	--	< 410	< 410	< 430	< 410	< 420
m-Dinitrobenzene	100	190,000,000	< 410	< 410	< 430	< 410	< 420
Methapyrilene	--	--	< 84,000	< 83,000	< 87,000	< 83,000	< 85,000
Methyl methanesulfonate	2,600	190,000,000	< 410	< 410	< 430	< 410	< 420
Methyl parathion	420	55,000	< 410	< 410	< 430	< 410	< 420
Naphthalene	25,000	190,000,000	< 410	< 410	< 430	300J	240
Nitrobenzene	5,100	10,000,000	< 410	< 410	< 430	< 410	< 420
N-Nitrosodiethylamine	1.3	44	< 410	< 410	< 430	< 410	< 420
N-Nitrosodimethylamine	1.3	130	< 410	< 410	< 430	< 410	< 420
N-Nitrosodi-n-butylamine	14	10,000,000	< 410	< 410	< 430	< 410	< 420
n-Nitrosodi-n-propylamine	37	10,000,000	< 410	< 410	< 430	< 410	< 420
N-Nitrosodiphenylamine	83,000	190,000,000	< 410	< 410	< 430	< 410	< 420
N-Nitrosomethylethylamine	--	--	< 410	< 410	< 430	< 410	< 420
N-Nitrosomorpholine	--	--	< 410	< 410	< 430	< 410	< 420
N-Nitrosopiperidine	--	--	< 410	< 410	< 430	< 410	< 420
N-Nitrosopyrrolidine	--	--	< 410	< 410	< 430	< 410	< 420
O,O,O-Triethyl phosphorothioate	--	--	< 410	< 410	< 430	< 410	< 420
o-Toluidine	1,200	10,000,000	< 410	< 410	< 430	< 410	< 420
p-(Dimethylamino)azobenzene	150	190,000,000	< 410	< 410	< 430	< 410	< 420
Pentachlorobenzene	660,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Pentachloronitrobenzene	20,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Pentachlorophenol	5,000	190,000,000	< 2,100	< 2,100	< 2,200	< 2,100	< 2,200
Phenacetin	120,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Phenol	400,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Phenanthrene	10,000,000	190,000,000	< 410	< 410	220J	< 410	< 420
Phorate	880	43,000	< 410	< 410	< 430	< 410	< 420
Pronamide	5,000	190,000,000	< 410	< 410	< 430	< 410	< 420
Pyrene	2,200,000	190,000,000	32J	< 410	380J	< 410	< 420
Pyridine	2,000	210,000	< 410	< 410	< 430	< 410	< 420
Safrole	--	--	< 410	< 410	< 430	< 410	< 420
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 410	< 410	< 430	< 410	< 420
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 410	< 410	< 430	< 410	< 420

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	TF-2 (6-8) 12/12/2003	TF-3 (7.4-9.4) 12/8/2003	TF-4 (4-6) 12/12/2003	TF-5 (7.7-9.7) 12/8/2003	TF-6 (14-16) 12/8/2003
Inorganics (mg/kg) [a]							
Antimony	27	190,000	< 2.3	< 2.3	< 2.5	< 2.1	< 2.1
Arsenic	150	190,000	9.8	10L	13	2.4L	18L
Barium	8,200	190,000	180	140	150	57	110
Beryllium	320	190,000	1	0.92	1.8	0.72	1
Cadmium	38	190,000	< 0.56	< 0.58	0.72	< 0.52	0.42B
Chromium	190,000	190,000	27	20K	28	18K	22K
Cobalt	200	190,000	14	14K	28	8.8K	15K
Copper	36,000	190,000	25	23	47	18	30
Lead	450	190,000	16L	16L	62L	11L	17L
Mercury	10	190,000	0.0079J	0.028	0.053	0.024	0.17
Nickel	650	190,000	30	25	53	21	32
Selenium	26	190,000	< 1.1	< 1.2R	< 1.2	< 1R	< 1.1R
Silver	84	190,000	< 1.1	< 1.2	< 1.2	< 1	< 1.1
Thallium	14	190,000	< 1.1L	< 1.2L	< 1.2L	< 1L	< 1.1L
Tin	6,100	190,000	2.2B	2.3B	4.1B	2B	1.7B
Vanadium	72,000	190,000	33	23	35	17	27
Zinc	12,000	190,000	76	66	180	57	82

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	TF-7 (5.5-7) 12/12/2003	TF-8 (6-7.5) 12/12/2003	UP-1 (13.7-15.7) 12/4/2003	UP-2 (13.5-15.5) 12/4/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 1,100	< 1,200	< 210	< 5.3
1,1,1-Trichloroethane	20,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
1,1,2,2-Tetrachloroethane	30	33,000	< 1,100	< 1,200	< 210	< 5.3
1,1,2-Trichloroethane	500	120,000	< 1,100	< 1,200	< 210	< 5.3
1,1-Dichloroethane	11,000	1,200,000	< 1,100	< 1,200	< 210	< 5.3
1,1-Dichloroethene	190	38,000	< 1,100	< 1,200	< 210	< 5.3
1,2,3-Trichloropropane	400,000	950	< 1,100	< 1,200	< 210	< 5.3
1,2,4-Trimethylbenzene	20,000	360,000	14,000	< 1,200	3,700	< 5.3
1,2-Dibromo-3-chloropropane	20	12,000	< 2,100	< 2,400	< 420	< 10
1,2-Dibromoethane (EDB)	5	8,600	< 1,100	< 1,200	< 210	< 5.3
1,2-Dichloroethane	500	73,000	< 1,100	< 1,200	< 210	< 5.3
1,2-Dichloropropane	500	180,000	< 1,100	< 1,200	< 210	< 5.3
1,3,5-Trimethylbenzene	6,200	360,000	15,000	870J	1,100	< 5.3
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 5,300	< 6,000	< 1,000	< 26
2-Hexanone	-[d]	-	< 5,300	< 6,000	< 1,000	< 26
3-Chloropropene (Allylchloride)	4,100	430,000	< 1,100	< 1,200	< 210	< 5.3
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 5,300	< 6,000	< 1,000	< 26
Acetone	1,000,000	10,000,000	< 11,000	< 12,000	840J	< 53
Acetonitrile	35,000	3,600,000	< 43,000	< 48,000	< 8,400	< 210
Acrolein (Propenal)	12	1,200	< 21,000	< 24,000	< 4,200	< 100
Acrylonitrile	270	28,000	< 21,000	< 24,000	< 4,200	< 100
Benzene	500	240,000	< 1,100	< 1,200	< 210	< 5.3
Bromodichloromethane	10,000	51,000	< 1,100	< 1,200	< 210	< 5.3
Bromoform	10,000	1,700,000	< 1,100	< 1,200	< 210	< 5.3
Bromomethane (Methyl Bromide)	1,000	300,000	< 1,100	< 1,200	< 210	< 5.3
Carbon disulfide	410,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
Carbon tetrachloride	500	120,000	< 1,100	< 1,200	< 210	< 5.3
Chlorobenzene	10,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
Chloroethane	90,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
Chloroform	10,000	19,000	< 1,100	< 1,200	< 210	< 5.3
Chloromethane (Methyl Chloride)	300	1,000,000	< 1,100	< 1,200	< 210	< 5.3
Chloroprene	4,100	430,000	< 1,100	< 1,200	< 210	< 5.3
cis-1,2-Dichloroethene	7,000	2,100,000	< 1,100	< 1,200	< 210	< 5.3
cis-1,3-Dichloropropene[c]	2,600	470,000	< 1,100	< 1,200	< 210	< 5.3
Dibromochloromethane	-	-	< 1,100	< 1,200	< 210	< 5.3
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 1,100	< 1,200	< 210	< 5.3
Dichlorodifluoromethane	100,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
Ethyl methacrylate	180,000	190,000,000	< 1,100	< 1,200	< 210	< 5.3
Ethylbenzene	70,000	10,000,000	2,300	2,700	3,000	< 5.3
Iodomethane (Methyl iodide)	-	-	< 1,100	< 1,200	< 210	< 5.3
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 43,000	< 48,000	< 8,400	< 210
Methacrylonitrile	410	43,000	< 21,000	< 24,000	< 4,200	< 100
Methyl methacrylate	410,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
Methylene chloride (Dichloromethane)	500	1,000,000	< 1,100	< 1,200	< 210	< 5.3
Pentachloroethane	-	-	< 5,300	< 6,000	< 1,000	< 26
Propionitrile	-	-	< 21,000	< 24,000	< 4,200	< 100
Styrene	24,000	10,000,000	250B	1,900	< 210	< 5.3
Tetrachloroethene	500	3,300,000	< 1,100	< 1,200	< 210	< 5.3
Toluene	100,000	10,000,000	< 1,100	< 1,200	< 210	< 5.3
trans-1,2-Dichloroethene	10,000	4,300,000	< 1,100	< 1,200	< 210	< 5.3
trans-1,3-Dichloropropene[c]	2,600	470,000	< 1,100	< 1,200	< 210	< 5.3
trans-1,4-Dichloro-2-butene	7	190,000,000	< 2,100	< 2,400	< 420	< 10
Trichloroethene	500	1,100,000	< 1,100	< 1,200	< 210	< 5.3
Trichlorofluoromethane	-	-	< 1,100	< 1,200	< 210	< 5.3
Vinyl acetate	120,000	10,000,000	< 2,100	< 2,400	< 420	< 10
Vinyl chloride	200	220,000	< 1,100	< 1,200	< 210	< 5.3
Xylenes, Total	1,000,000	10,000,000	2,800	2,100J	200J	< 10

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	TF-7 (5.5-7) 12/12/2003	TF-8 (6-7.5) 12/12/2003	UP-1 (13.7-15.7) 12/4/2003	UP-2 (13.5-15.5) 12/4/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 420	< 410	< 420	< 420
1,2,4-Trichlorobenzene	27,000	10,000,000	< 420	< 410	< 420	< 420
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 420	< 410	< 420	< 420
1,3,5-Trinitrobenzene	--	--	< 420	< 410	< 420	< 420
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 420	< 410	< 420	< 420
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 420	< 410	< 420	< 420
1,4-Dioxane	2,400	240,000	< 420	< 410	< 420	< 420
1,4-Naphthoquinone	--	--	< 420	< 410	< 420	< 420
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,200	< 2,100	< 2,200	< 2,200
1-Naphthylamine	1,100	190,000,000	< 420	< 410	< 420	< 420
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 420	< 410	< 420	< 420
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 420	< 410	< 420	< 420
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 420	< 410	< 420	< 420
2,4,6-Trichlorophenol	8,900	190,000,000	< 420	< 410	< 420	< 420
2,4-Dichlorophenol	2,000	190,000,000	< 420	< 410	< 420	< 420
2,4-Dimethylphenol	200,000	10,000,000	< 420	< 410	< 420	< 420
2,4-Dinitrophenol	4,100	190,000,000	< 2,200	< 2,100	< 2,200	< 2,200
2,4-Dinitrotoluene	840	190,000,000	< 420	< 410	< 420	< 420
2,6-Dichlorophenol	--	--	< 420	< 410	< 420	< 420
2,6-Dinitrotoluene	10,000	190,000,000	< 420	< 410	< 420	< 420
2-Acetylaminofluorene	280	190,000,000	< 420	< 410	< 420	< 420
2-Chloronaphthalene	18,000,000	190,000,000	< 420	< 410	< 420	< 420
2-Chlorophenol	4,400	1,100,000	< 420	< 410	< 420	< 420
2-Methylnaphthalene	8,000,000	10,000,000	< 420	< 410	< 420	< 420
2-Naphthylamine	140	190,000,000	< 420	< 410	< 420	< 420
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,200	< 2,100	< 2,200	< 2,200
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 420	< 410	< 420	< 420
2-Picoline	--	--	< 420	< 410	< 420	< 420
3,3'-Dichlorobenzidine	32,000	190,000,000	< 850	< 820	< 840	< 840
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,200	< 2,100	< 2,200	< 2,200
3-Methylcholanthrene	--	--	< 420	< 410	< 420	< 420
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,200	< 2,100	< 2,200	< 2,200
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,200	< 2,100	< 2,200	< 2,200
4-Aminobiphenyl	12	190,000,000	< 420	< 410	< 420	< 420
4-Bromophenylphenyl ether	--	--	< 420	< 410	< 420	< 420
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 420	< 410	< 420	< 420
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 850	< 820	< 840	< 840
4-Chlorophenylphenyl ether	--	--	< 420	< 410	< 420	< 420
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,200	< 2,100	< 2,200	< 2,200
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,200	< 2,100	< 2,200	< 2,200
4-Nitroquinoline-1-oxide	--	--	< 4,200	< 4,100	< 4,200	< 4,200
5-Nitro-o-toluidine	--	--	< 420	< 410	< 420	< 420
7,12-Dimethylbenz(a)anthracene	--	--	< 420	< 410	< 420	< 420
Acenaphthene	4,700,000	190,000,000	< 420	< 410	< 420	< 420
Acenaphthylene	6,900,000	190,000,000	< 420	< 410	< 420	< 420
Acetophenone	1,000,000	10,000,000	< 420	< 410	< 420	< 420
alpha,alpha-Dimethylphenethylamine	--	--	< 86,000	< 84,000	< 85,000	< 85,000
Aniline	580	600,000	< 420	< 410	< 420	< 420
Anthracene	350,000	190,000,000	< 420	< 410	< 420	< 420
Aramite, Total	--	--	< 420	< 410	< 420	< 420
Benzo(a)anthracene	320,000	190,000,000	< 420	< 410	< 420	< 420
Benzo(a)pyrene	46,000	190,000,000	< 420	< 410	< 420	< 420
Benzo(b)fluoranthene	170,000	190,000,000	< 420	< 410	< 420	< 420
Benzo(g,h,i)perylene	180,000	190,000,000	< 420	< 410	< 420	50J
Benzo(k)fluoranthene	610,000	190,000,000	< 420	< 410	< 420	< 420
Benzyl alcohol	3,100,000	10,000,000	< 420	< 410	< 420	< 420
bis(2-Chloroethoxy)methane	--	--	< 420	< 410	< 420	< 420
bis(2-Chloroethyl)ether	55	5,700	< 420	< 410	< 420	< 420

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	TF-7 (5.5-7) 12/12/2003	TF-8 (6-7.5) 12/12/2003	UP-1 (13.7-15.7) 12/4/2003	UP-2 (13.5-15.5) 12/4/2003
Semivolatile Organic Compounds (continued) (ug/kg)						
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 420	< 410	< 420	< 420
Butylbenzylphthalate	10,000,000	10,000,000	< 420	< 410	< 420	< 420
Chrysene	230,000	190,000,000	< 420	< 410	< 420	< 420
Cresol (ortho)	510,000	10,000,000	< 420	< 410	< 420	< 420
Cresol, m & p	51,000	190,000,000	< 420	< 410	< 420	< 420
Diallate, Total	1,000	110,000	< 420	< 410	< 420	< 420
Dibenzo(a,h)anthracene	160,000	190,000,000	< 420	< 410	< 420	43J
Dibenzofuran	--	--	< 420	< 410	< 420	< 420
Diethylphthalate	500,000	10,000,000	< 420	< 410	< 420	< 420
Dimethoate	2,000	190,000,000	< 420	< 410	< 420	< 420
Dimethylphthalate	--	--	< 420	< 410	< 420	< 420
Di-n-butylphthalate	4,100,000	10,000,000	< 420	< 410	< 420	< 420
Di-n-octylphthalate	10,000,000	10,000,000	< 420	< 410	< 420	< 420
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 420	< 410	< 420	< 420
Disulfoton	78	8,700	< 420	< 410	< 420	< 420
Ethyl methanesulfonate	--	--	< 420	< 410	< 420	< 420
Ethyl parathion (Parathion)	360,000	10,000,000	< 420	< 410	< 420	< 420
Famphur	--	--	< 420	< 410	< 420	< 420
Fluoranthene	3,200,000	190,000,000	< 420	< 410	< 420	< 420
Fluorene	3,800,000	190,000,000	< 420	< 410	< 420	< 420
Hexachlorobenzene	960	190,000,000	< 420	< 410	< 420	< 420
Hexachlorobutadiene	1,200	10,000,000	< 420	< 410	< 420	< 420
Hexachlorocyclopentadiene	91,000	10,000,000	< 420	< 410	< 420	< 420
Hexachloroethane	560	190,000,000	< 420	< 410	< 420	< 420
Hexachlorophene	--	--	< 220,000	< 210,000	< 220,000	< 220,000
Hexachloropropene	--	--	< 420	< 410	< 420	< 420
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 420	< 410	< 420	29J
Isophorone	10,000	10,000,000	< 420	< 410	< 420	< 420
Isosafrole	--	--	< 420	< 410	< 420	< 420
m-Dinitrobenzene	100	190,000,000	< 420	< 410	< 420	< 420
Methapyrilene	--	--	< 86,000	< 84,000	< 85,000	< 85,000
Methyl methanesulfonate	2,600	190,000,000	< 420	< 410	< 420	< 420
Methyl parathion	420	55,000	< 420	< 410	< 420	< 420
Naphthalene	25,000	190,000,000	490	120J	< 420	< 420
Nitrobenzene	5,100	10,000,000	< 420	< 410	< 420	< 420
N-Nitrosodiethylamine	1.3	44	< 420	< 410	< 420	< 420
N-Nitrosodimethylamine	1.3	130	< 420	< 410	< 420	< 420
N-Nitrosodi-n-butylamine	14	10,000,000	< 420	< 410	< 420	< 420
n-Nitrosodi-n-propylamine	37	10,000,000	< 420	< 410	< 420	< 420
N-Nitrosodiphenylamine	83,000	190,000,000	< 420	< 410	< 420	< 420
N-Nitrosomethylethylamine	--	--	< 420	< 410	< 420	< 420
N-Nitrosomorpholine	--	--	< 420	< 410	< 420	< 420
N-Nitrosopiperidine	--	--	< 420	< 410	< 420	< 420
N-Nitrosopyrrolidine	--	--	< 420	< 410	< 420	< 420
O,O,O-Triethyl phosphorothioate	--	--	< 420	< 410	< 420	< 420
o-Toluidine	1,200	10,000,000	< 420	< 410	< 420	< 420
p-(Dimethylamino)azobenzene	150	190,000,000	< 420	< 410	< 420	< 420
Pentachlorobenzene	660,000	190,000,000	< 420	< 410	< 420	< 420
Pentachloronitrobenzene	20,000	190,000,000	< 420	< 410	< 420	< 420
Pentachlorophenol	5,000	190,000,000	< 2,200	< 2,100	< 2,200	< 2,200
Phenacetin	120,000	190,000,000	< 420	< 410	< 420	< 420
Phenol	400,000	190,000,000	< 420	< 410	< 420	< 420
Phenanthrene	10,000,000	190,000,000	< 420	< 410	< 420	< 420
Phorate	880	43,000	< 420	< 410	< 420	< 420
Pronamide	5,000	190,000,000	< 420	< 410	< 420	< 420
Pyrene	2,200,000	190,000,000	< 420	< 410	< 420	< 420
Pyridine	2,000	210,000	< 420	< 410	< 420	< 420
Safrole	--	--	< 420	< 410	< 420	< 420
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 420	< 410	< 420	< 420
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 420	< 410	< 420	< 420

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	TF-7 (5.5-7) 12/12/2003	TF-8 (6-7.5) 12/12/2003	UP-1 (13.7-15.7) 12/4/2003	UP-2 (13.5-15.5) 12/4/2003
Inorganics (mg/kg) [a]						
Antimony	27	190,000	< 2.4	< 2.4	< 2.4	< 2.4
Arsenic	150	190,000	7.6	14	9.6L	10L
Barium	8,200	190,000	180	130	120	120
Beryllium	320	190,000	0.82	1	0.89	0.91
Cadmium	38	190,000	< 0.6	< 0.59	< 0.6	< 0.61
Chromium	190,000	190,000	21	22	17K	19K
Cobalt	200	190,000	11	13	15K	11K
Copper	36,000	190,000	18	24	23	23
Lead	450	190,000	12L	17L	15L	12L
Mercury	10	190,000	0.027	0.011J	0.028	0.018J
Nickel	650	190,000	31	26	26	25
Selenium	26	190,000	< 1.2	< 1.2	< 1.2R	< 1.2R
Silver	84	190,000	< 1.2	< 1.2	< 1.2	< 1.2
Thallium	14	190,000	< 1.2L	< 1.2L	< 1.2L	< 1.2
Tin	6,100	190,000	2.4B	2.2B	1.9B	1.8B
Vanadium	72,000	190,000	26	28	24	24
Zinc	12,000	190,000	60	69	66J	68J

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	UP-3 (15.3-17.3) 12/4/2003	UP-4 (9.6-11.6) 12/4/2003	UP-5 (6-8) 12/11/2003	UP-6 (10-12) 12/12/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 190	< 520	< 5.7	< 5.4
1,1,1-Trichloroethane	20,000	10,000,000	< 190	< 520	< 5.7	< 5.4
1,1,2,2-Tetrachloroethane	30	33,000	< 190	< 520	< 5.7	< 5.4
1,1,2-Trichloroethane	500	120,000	< 190	< 520	< 5.7	< 5.4
1,1-Dichloroethane	11,000	1,200,000	< 190	< 520	< 5.7	< 5.4
1,1-Dichloroethene	190	38,000	< 190	< 520	< 5.7	< 5.4
1,2,3-Trichloropropane	400,000	950	< 190	< 520	< 5.7	< 5.4
1,2,4-Trimethylbenzene	20,000	360,000	2,400	3,900	< 5.7	10
1,2-Dibromo-3-chloropropane	20	12,000	< 370	< 1,000	< 11	< 11
1,2-Dibromoethane (EDB)	5	8,600	< 190	< 520	< 5.7	< 5.4
1,2-Dichloroethane	500	73,000	< 190	< 520	< 5.7	< 5.4
1,2-Dichloropropane	500	180,000	< 190	< 520	< 5.7	< 5.4
1,3,5-Trimethylbenzene	6,200	360,000	1,600	1,200	< 5.7	12
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 930	< 2,600	< 28	< 27
2-Hexanone	--[d]	--	< 930	< 2,600	< 28	< 27
3-Chloropropene (Allylchloride)	4,100	430,000	< 190	< 520	< 5.7	< 5.4
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 930	< 2,600	< 28	< 27
Acetone	1,000,000	10,000,000	740J	< 5,200	32J	62
Acetonitrile	35,000	3,600,000	< 7,400	< 21,000	< 230	< 220
Acrolein (Propenal)	12	1,200	< 3,700	< 10,000	< 110	< 110
Acrylonitrile	270	28,000	< 3,700	< 10,000	< 110	< 110
Benzene	500	240,000	< 190	< 520	< 5.7	1.4B
Bromodichloromethane	10,000	51,000	< 190	< 520	< 5.7	< 5.4
Bromoform	10,000	1,700,000	< 190	< 520	< 5.7	< 5.4
Bromomethane (Methyl Bromide)	1,000	300,000	< 190	< 520	< 5.7	< 5.4
Carbon disulfide	410,000	10,000,000	< 190	< 520	< 5.7	< 5.4
Carbon tetrachloride	500	120,000	< 190	< 520	< 5.7	< 5.4
Chlorobenzene	10,000	10,000,000	< 190	< 520	< 5.7	< 5.4
Chloroethane	90,000	10,000,000	< 190	< 520	< 5.7	< 5.4
Chloroform	10,000	19,000	< 190	< 520	< 5.7	< 5.4
Chloromethane (Methyl Chloride)	300	1,000,000	< 190	< 520	< 5.7	< 5.4
Chloroprene	4,100	430,000	< 190	< 520	< 5.7	< 5.4
cis-1,2-Dichloroethene	7,000	2,100,000	< 190	< 520	< 5.7	< 5.4
cis-1,3-Dichloropropene[c]	2,600	470,000	< 190	< 520	< 5.7	< 5.4
Dibromochloromethane	--	--	< 190	< 520	< 5.7	< 5.4
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 190	< 520	< 5.7	< 5.4
Dichlorodifluoromethane	100,000	10,000,000	< 190	< 520	< 5.7	< 5.4
Ethyl methacrylate	180,000	190,000,000	< 190	< 520	< 5.7	< 5.4
Ethylbenzene	70,000	10,000,000	1,300	3,600	< 5.7	5.2J
Iodomethane (Methyl iodide)	--	--	< 190	< 520	< 5.7	< 5.4
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 7,400	< 21,000	< 230	< 220
Methacrylonitrile	410	43,000	< 3,700	< 10,000	< 110	< 110
Methyl methacrylate	410,000	10,000,000	< 190	< 520	< 5.7	< 5.4
Methylene chloride (Dichloromethane)	500	1,000,000	< 190	< 520	< 5.7	< 5.4
Pentachloroethane	--	--	< 930	< 2,600	< 28	< 27
Propionitrile	--	--	< 3,700	< 10,000	< 110	< 110
Styrene	24,000	10,000,000	1,300	< 520	< 5.7	< 5.4
Tetrachloroethene	500	3,300,000	< 190	< 520	< 5.7	< 5.4
Toluene	100,000	10,000,000	140J	< 520	< 5.7	3.4J
trans-1,2-Dichloroethene	10,000	4,300,000	< 190	< 520	< 5.7	< 5.4
trans-1,3-Dichloropropene[c]	2,600	470,000	< 190	< 520	< 5.7	< 5.4
trans-1,4-Dichloro-2-butene	7	190,000,000	< 370	< 1,000	< 11	< 11
Trichloroethene	500	1,100,000	< 190	< 520	< 5.7	< 5.4
Trichlorofluoromethane	--	--	< 190	< 520	< 5.7	< 5.4
Vinyl acetate	120,000	10,000,000	< 370	< 1,000	< 11	< 11
Vinyl chloride	200	220,000	< 190	< 520	< 5.7	< 5.4
Xylenes, Total	1,000,000	10,000,000	1,500	< 1,000	< 11	16

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	UP-3 (15.3-17.3) 12/4/2003	UP-4 (9.6-11.6) 12/4/2003	UP-5 (6-8) 12/11/2003	UP-6 (10-12) 12/12/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 420	< 430	< 430	< 410
1,2,4-Trichlorobenzene	27,000	10,000,000	< 420	< 430	< 430	< 410
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 420	< 430	< 430	< 410
1,3,5-Trinitrobenzene	--	--	< 420	< 430	< 430	< 410
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 420	< 430	< 430	< 410
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 420	< 430	< 430	< 410
1,4-Dioxane	2,400	240,000	< 420	< 430	< 430	< 410
1,4-Naphthoquinone	--	--	< 420	< 430	< 430	< 410
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,200	< 2,200	< 2,200	< 2,100
1-Naphthylamine	1,100	190,000,000	< 420	< 430	< 430	< 410
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 420	< 430	< 430	< 410
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 420	< 430	< 430	< 410
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 420	< 430	< 430	< 410
2,4,6-Trichlorophenol	8,900	190,000,000	< 420	< 430	< 430	< 410
2,4-Dichlorophenol	2,000	190,000,000	< 420	< 430	< 430	< 410
2,4-Dimethylphenol	200,000	10,000,000	< 420	< 430	< 430	< 410
2,4-Dinitrophenol	4,100	190,000,000	< 2,200	< 2,200	< 2,200	< 2,100
2,4-Dinitrotoluene	840	190,000,000	< 420	< 430	< 430	< 410
2,6-Dichlorophenol	--	--	< 420	< 430	< 430	< 410
2,6-Dinitrotoluene	10,000	190,000,000	< 420	< 430	< 430	< 410
2-Acetylaminofluorene	280	190,000,000	< 420	< 430	< 430	< 410
2-Chloronaphthalene	18,000,000	190,000,000	< 420	< 430	< 430	< 410
2-Chlorophenol	4,400	1,100,000	< 420	< 430	< 430	< 410
2-Methylnaphthalene	8,000,000	10,000,000	< 420	< 430	< 430	< 410
2-Naphthylamine	140	190,000,000	< 420	< 430	< 430	< 410
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,200	< 2,200	< 2,200	< 2,100
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 420	< 430	< 430	< 410
2-Picoline	--	--	< 420	< 430	< 430	< 410
3,3'-Dichlorobenzidine	32,000	190,000,000	< 840	< 860	< 870	< 820
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,200	< 2,200	< 2,200	< 2,100
3-Methylcholanthrene	--	--	< 420	< 430	< 430	< 410
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,200	< 2,200	< 2,200	< 2,100
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,200	< 2,200	< 2,200	< 2,100
4-Aminobiphenyl	12	190,000,000	< 420	< 430	< 430	< 410
4-Bromophenylphenyl ether	--	--	< 420	< 430	< 430	< 410
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 420	< 430	< 430	< 410
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 840	< 860	< 870	< 820
4-Chlorophenylphenyl ether	--	--	< 420	< 430	< 430	< 410
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,200	< 2,200	< 2,200	< 2,100
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,200	< 2,200	< 2,200	< 2,100
4-Nitroquinoline-1-oxide	--	--	< 4,200	< 4,300	< 4,300	< 4,100
5-Nitro-o-toluidine	--	--	< 420	< 430	< 430	< 410
7,12-Dimethylbenz(a)anthracene	--	--	< 420	< 430	< 430	< 410
Acenaphthene	4,700,000	190,000,000	< 420	< 430	< 430	< 410
Acenaphthylene	6,900,000	190,000,000	< 420	< 430	< 430	< 410
Acetophenone	1,000,000	10,000,000	< 420	< 430	< 430	< 410
alpha,alpha-Dimethylphenethylamine	--	--	< 85,000	< 87,000	< 88,000	< 84,000
Aniline	580	600,000	< 420	< 430	< 430	< 410
Anthracene	350,000	190,000,000	< 420	< 430	< 430	< 410
Aramite, Total	--	--	< 420	< 430	< 430	< 410
Benzo(a)anthracene	320,000	190,000,000	< 420	< 430	48J	< 410
Benzo(a)pyrene	46,000	190,000,000	< 420	< 430	52J	< 410
Benzo(b)fluoranthene	170,000	190,000,000	< 420	< 430	88J	< 410
Benzo(g,h,i)perylene	180,000	190,000,000	< 420	< 430	34J	< 410
Benzo(k)fluoranthene	610,000	190,000,000	< 420	< 430	< 430	< 410
Benzyl alcohol	3,100,000	10,000,000	< 420	< 430	< 430	< 410
bis(2-Chloroethoxy)methane	--	--	< 420	< 430	< 430	< 410
bis(2-Chloroethyl)ether	55	5,700	< 420	< 430	< 430	< 410

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	UP-3 (15.3-17.3) 12/4/2003	UP-4 (9.6-11.6) 12/4/2003	UP-5 (6-8) 12/11/2003	UP-6 (10-12) 12/12/2003
Semivolatile Organic Compounds (continued) (ug/kg)						
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 420	< 430	300J	< 410
Butylbenzylphthalate	10,000,000	10,000,000	< 420	< 430	< 430	< 410
Chrysene	230,000	190,000,000	< 420	< 430	68J	< 410
Cresol (ortho)	510,000	10,000,000	< 420	< 430	< 430	< 410
Cresol, m & p	51,000	190,000,000	< 420	< 430	< 430	< 410
Diallate, Total	1,000	110,000	< 420	< 430	< 430	< 410
Dibenzo(a,h)anthracene	160,000	190,000,000	< 420	< 430	< 430	< 410
Dibenzofuran	--	--	< 420	< 430	< 430	< 410
Diethylphthalate	500,000	10,000,000	< 420	< 430	< 430	< 410
Dimethoate	2,000	190,000,000	< 420	< 430	< 430	< 410
Dimethylphthalate	--	--	< 420	< 430	< 430	< 410
Di-n-butylphthalate	4,100,000	10,000,000	< 420	< 430	< 430	< 410
Di-n-octylphthalate	10,000,000	10,000,000	< 420	< 430	< 430	< 410
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 420	< 430	< 430	< 410
Disulfoton	78	8,700	< 420	< 430	< 430	< 410
Ethyl methanesulfonate	--	--	< 420	< 430	< 430	< 410
Ethyl parathion (Parathion)	360,000	10,000,000	< 420	< 430	< 430	< 410
Famphur	--	--	< 420	< 430	< 430	< 410
Fluoranthene	3,200,000	190,000,000	< 420	< 430	80J	< 410
Fluorene	3,800,000	190,000,000	< 420	< 430	< 430	< 410
Hexachlorobenzene	960	190,000,000	< 420	< 430	< 430	< 410
Hexachlorobutadiene	1,200	10,000,000	< 420	< 430	< 430	< 410
Hexachlorocyclopentadiene	91,000	10,000,000	< 420	< 430	< 430	< 410
Hexachloroethane	560	190,000,000	< 420	< 430	< 430	< 410
Hexachlorophene	--	--	< 220,000	< 220,000	< 220,000	< 210,000
Hexachloropropene	--	--	< 420	< 430	< 430	< 410
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 420	< 430	32J	< 410
Isophorone	10,000	10,000,000	< 420	< 430	< 430	< 410
Isosafrole	--	--	< 420	< 430	< 430	< 410
m-Dinitrobenzene	100	190,000,000	< 420	< 430	< 430	< 410
Methapyrilene	--	--	< 85,000	< 87,000	< 88,000	< 84,000
Methyl methanesulfonate	2,600	190,000,000	< 420	< 430	< 430	< 410
Methyl parathion	420	55,000	< 420	< 430	< 430	< 410
Naphthalene	25,000	190,000,000	350J	< 430	45B	< 410
Nitrobenzene	5,100	10,000,000	< 420	< 430	< 430	< 410
N-Nitrosodiethylamine	1.3	44	< 420	< 430	< 430	< 410
N-Nitrosodimethylamine	1.3	130	< 420	< 430	< 430	< 410
N-Nitrosodi-n-butylamine	14	10,000,000	< 420	< 430	< 430	< 410
n-Nitrosodi-n-propylamine	37	10,000,000	< 420	< 430	< 430	< 410
N-Nitrosodiphenylamine	83,000	190,000,000	< 420	< 430	< 430	< 410
N-Nitrosomethylethylamine	--	--	< 420	< 430	< 430	< 410
N-Nitrosomorpholine	--	--	< 420	< 430	< 430	< 410
N-Nitrosopiperidine	--	--	< 420	< 430	< 430	< 410
N-Nitrosopyrrolidine	--	--	< 420	< 430	< 430	< 410
O,O,O-Triethyl phosphorothioate	--	--	< 420	< 430	< 430	< 410
o-Toluidine	1,200	10,000,000	< 420	< 430	< 430	< 410
p-(Dimethylamino)azobenzene	150	190,000,000	< 420	< 430	< 430	< 410
Pentachlorobenzene	660,000	190,000,000	< 420	< 430	< 430	< 410
Pentachloronitrobenzene	20,000	190,000,000	< 420	< 430	< 430	< 410
Pentachlorophenol	5,000	190,000,000	< 2,200	< 2,200	< 2,200	< 2,100
Phenacetin	120,000	190,000,000	< 420	< 430	< 430	< 410
Phenol	400,000	190,000,000	< 420	< 430	< 430	< 410
Phenanthrene	10,000,000	190,000,000	< 420	< 430	< 430	< 410
Phorate	880	43,000	< 420	< 430	< 430	< 410
Pronamide	5,000	190,000,000	< 420	< 430	< 430	< 410
Pyrene	2,200,000	190,000,000	< 420	< 430	66J	< 410
Pyridine	2,000	210,000	< 420	< 430	< 430	< 410
Safrole	--	--	< 420	< 430	< 430	< 410
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 420	< 430	< 430	< 410
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 420	< 430	< 430	< 410

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	UP-3 (15.3-17.3) 12/4/2003	UP-4 (9.6-11.6) 12/4/2003	UP-5 (6-8) 12/11/2003	UP-6 (10-12) 12/12/2003
Inorganics (mg/kg) (a)						
Antimony	27	190,000	< 2.3	< 2.3	< 2.4	< 2.4
Arsenic	150	190,000	9.5L	8.9L	11K	9.6
Barium	8,200	190,000	83	140	140	150
Beryllium	320	190,000	0.94	0.9	1.3	0.95
Cadmium	38	190,000	< 0.56	< 0.58	0.39J	< 0.59
Chromium	190,000	190,000	21K	20K	20	21
Cobalt	200	190,000	13K	13K	18	22
Copper	36,000	190,000	23	22	39	24
Lead	450	190,000	14L	15L	79L	16L
Mercury	10	190,000	0.025	0.021J	0.072	0.025
Nickel	650	190,000	26	28	21	28
Selenium	26	190,000	< 1.1R	< 1.2R	< 1.2L	< 1.2
Silver	84	190,000	< 1.1	< 1.2	< 1.2	< 1.2
Thallium	14	190,000	< 1.1L	< 1.2L	< 1.2	< 1.2L
Tin	6,100	190,000	1.8B	2B	3.7B	2.1B
Vanadium	72,000	190,000	28	25	28	29
Zinc	12,000	190,000	71J	68J	120	76

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	UP-7 (14-16) 12/11/2003	UP-8 (14-16) 12/12/2003	UP-9 (16.5-18.5) 12/5/2003	V-1 (12.9-14.9) 12/5/2003
Volatile Organic Compounds (ug/kg) [a]						
1,1,1,2-Tetrachloroethane	18,000	190,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,1,1-Trichloroethane	20,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,1,2,2-Tetrachloroethane	30	33,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,1,2-Trichloroethane	500	120,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,1-Dichloroethane	11,000	1,200,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,1-Dichloroethene	190	38,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,2,3-Trichloropropane	400,000	950	<5.2/<5.1	< 210	< 5.1	< 9,200
1,2,4-Trimethylbenzene	20,000	360,000	1.4J/1.6J	460	< 5.1	230,000
1,2-Dibromo-3-chloropropane	20	12,000	<10/<10	< 420	< 10	< 18,000
1,2-Dibromoethane (EDB)	5	8,600	<5.2/<5.1	< 210	< 5.1	< 9,200
1,2-Dichloroethane	500	73,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,2-Dichloropropane	500	180,000	<5.2/<5.1	< 210	< 5.1	< 9,200
1,3,5-Trimethylbenzene	6,200	360,000	2.3J/2.4J	490	< 5.1	88,000
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	<26/<26	190J	< 26	< 46,000
2-Hexanone	--[d]	--	<26/<26	< 1,000	< 26	< 46,000
3-Chloropropene (Allylchloride)	4,100	430,000	<5.2/<5.1	< 210	< 5.1	< 9,200
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	<26/<26	< 1,000	< 26	< 46,000
Acetone	1,000,000	10,000,000	19J/<51	< 2,100	< 51	< 92,000
Acetonitrile	35,000	3,600,000	<210/<200	< 8,400	< 200	< 370,000
Acrolein (Propenal)	12	1,200	<100/<100	< 4,200	< 100	< 180,000
Acrylonitrile	270	28,000	<100/<100	< 4,200	< 100	< 180,000
Benzene	500	240,000	<5.2/<5.1	83B	< 5.1	9,200
Bromodichloromethane	10,000	51,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Bromoform	10,000	1,700,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Bromomethane (Methyl Bromide)	1,000	300,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Carbon disulfide	410,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Carbon tetrachloride	500	120,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Chlorobenzene	10,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Chloroethane	90,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Chloroform	10,000	19,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Chloromethane (Methyl Chloride)	300	1,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Chloroprene	4,100	430,000	<5.2/<5.1	< 210	< 5.1	< 9,200
cis-1,2-Dichloroethene	7,000	2,100,000	<5.2/<5.1	< 210	< 5.1	< 9,200
cis-1,3-Dichloropropene[c]	2,600	470,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Dibromochloromethane	--	--	<5.2/<5.1	< 210	< 5.1	< 9,200
Dibromomethane (Methylene bromide)	20,000	2,100,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Dichlorodifluoromethane	100,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Ethyl methacrylate	180,000	190,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Ethylbenzene	70,000	10,000,000	<5.2/<5.1	2,000	< 5.1	34,000
Iodomethane (Methyl iodide)	--	--	<5.2/<5.1	< 210	< 5.1	< 9,200
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	<210/<200	< 8,400	< 200	< 370,000
Methacrylonitrile	410	43,000	<100/<100	< 4,200	< 100	< 180,000
Methyl methacrylate	410,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Methylene chloride (Dichloromethane)	500	1,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Pentachloroethane	--	--	<26/<26	< 1,000	< 26	< 46,000
Propionitrile	--	--	<100/<100	< 4,200	< 100	< 180,000
Styrene	24,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Tetrachloroethene	500	3,300,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Toluene	100,000	10,000,000	<5.2/<5.1	< 210	< 5.1	< 9,200
trans-1,2-Dichloroethene	10,000	4,300,000	<5.2/<5.1	< 210	< 5.1	< 9,200
trans-1,3-Dichloropropene[c]	2,600	470,000	<5.2/<5.1	< 210	< 5.1	< 9,200
trans-1,4-Dichloro-2-butene	7	190,000,000	<10/<10	< 420	< 10	< 18,000
Trichloroethene	500	1,100,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Trichlorofluoromethane	--	--	<5.2/<5.1	< 210	< 5.1	< 9,200
Vinyl acetate	120,000	10,000,000	<10/<10	< 420	< 10	< 18,000
Vinyl chloride	200	220,000	<5.2/<5.1	< 210	< 5.1	< 9,200
Xylenes, Total	1,000,000	10,000,000	<10/<10	760	< 10	18,000J

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	UP-7 (14-16) 12/11/2003	UP-8 (14-16) 12/12/2003	UP-9 (16.5-18.5) 12/5/2003	V-1 (12.9-14.9) 12/5/2003
Semivolatile Organic Compounds (ug/kg)						
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	<410/<410	< 420	< 410	< 380
1,2,4-Trichlorobenzene	27,000	10,000,000	<410/<410	< 420	< 410	< 380
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	<410/<410	< 420	< 410	< 380
1,3,5-Trinitrobenzene	--	--	<410/<410	< 420	< 410	< 380
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	<410/<410	< 420	< 410	< 380
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	<410/<410	< 420	< 410	< 380
1,4-Dioxane	2,400	240,000	<410/<410	< 420	< 410	< 380
1,4-Naphthoquinone	--	--	<410/<410	< 420	< 410	< 380
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	<2,100/<2,100	< 2,200	< 2,100	< 1,900
1-Naphthylamine	1,100	190,000,000	<410/<410	< 420	< 410	< 380
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	<410/<410	< 420	< 410	< 380
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	<410/<410	< 420	< 410	< 380
2,4,5-Trichlorophenol	6,100,000	190,000,000	<410/<410	< 420	< 410	< 380
2,4,6-Trichlorophenol	8,900	190,000,000	<410/<410	< 420	< 410	< 380
2,4-Dichlorophenol	2,000	190,000,000	<410/<410	< 420	< 410	< 380
2,4-Dimethylphenol	200,000	10,000,000	<410/<410	< 420	< 410	< 380
2,4-Dinitrophenol	4,100	190,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
2,4-Dinitrotoluene	840	190,000,000	<410/<410	< 420	< 410	< 380
2,6-Dichlorophenol	--	--	<410/<410	< 420	< 410	< 380
2,6-Dinitrotoluene	10,000	190,000,000	<410/<410	< 420	< 410	< 380
2-Acetylaminofluorene	280	190,000,000	<410/<410	< 420	< 410	< 380
2-Chloronaphthalene	18,000,000	190,000,000	<410/<410	< 420	< 410	< 380
2-Chlorophenol	4,400	1,100,000	<410/<410	< 420	< 410	< 380
2-Methylnaphthalene	8,000,000	10,000,000	<410/<410	< 420	< 410	< 380
2-Naphthylamine	140	190,000,000	<410/<410	< 420	< 410	< 380
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	<410/<410	< 420	< 410	< 380
2-Picoline	--	--	<410/<410	< 420	< 410	< 380
3,3'-Dichlorobenzidine	32,000	190,000,000	<820/<810	< 840	< 820	< 750
3,3'-Dimethylbenzidine	1,500	10,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
3-Methylcholanthrene	--	--	<410/<410	< 420	< 410	< 380
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	<2,100/<2,100	< 2,200	< 2,100	< 1,900
4-Aminobiphenyl	12	190,000,000	<410/<410	< 420	< 410	< 380
4-Bromophenylphenyl ether	--	--	<410/<410	< 420	< 410	< 380
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	<410/<410	< 420	< 410	< 380
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	<820/<810	< 840	< 820	< 750
4-Chlorophenylphenyl ether	--	--	<410/<410	< 420	< 410	< 380
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
4-Nitroquinoline-1-oxide	--	--	<4,100/<4,100	< 4,200	< 4,100	< 3,800
5-Nitro-o-toluidine	--	--	<410/<410	< 420	< 410	< 380
7,12-Dimethylbenz(a)anthracene	--	--	<410/<410	< 420	< 410	< 380
Acenaphthene	4,700,000	190,000,000	<410/<410	< 420	< 410	< 380
Acenaphthylene	6,900,000	190,000,000	<410/<410	< 420	< 410	< 380
Acetophenone	1,000,000	10,000,000	<410/<410	< 420	< 410	< 380
alpha,alpha-Dimethylphenethylamine	--	--	<84,000/<83,000	< 85,000	< 84,000	< 76,000
Aniline	580	600,000	<410/<410	< 420	< 410	< 380
Anthracene	350,000	190,000,000	<410/<410	< 420	< 410	< 380
Aramite, Total	--	--	<410/<410	< 420	< 410	< 380
Benzo(a)anthracene	320,000	190,000,000	<410/<410	< 420	< 410	82B
Benzo(a)pyrene	46,000	190,000,000	<410/<410	< 420	< 410	84J
Benzo(b)fluoranthene	170,000	190,000,000	<410/<410	< 420	< 410	99J
Benzo(g,h,i)perylene	180,000	190,000,000	<410/<410	< 420	< 410	64J
Benzo(k)fluoranthene	610,000	190,000,000	<410/<410	< 420	< 410	< 380
Benzyl alcohol	3,100,000	10,000,000	<410/<410	< 420	< 410	< 380
bis(2-Chloroethoxy)methane	--	--	<410/<410	< 420	< 410	< 380
bis(2-Chloroethyl)ether	55	5,700	<410/<410	< 420	< 410	< 380

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	UP-7 (14-16) 12/11/2003	UP-8 (14-16) 12/12/2003	UP-9 (16.5-18.5) 12/5/2003	V-1 (12.9-14.9) 12/5/2003
Semivolatile Organic Compounds (continued) (ug/kg)						
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	200J/180J	< 420	< 410	< 380
Butylbenzylphthalate	10,000,000	10,000,000	<410/<410	< 420	< 410	< 380
Chrysene	230,000	190,000,000	<410/<410	< 420	< 410	100B
Cresol (ortho)	510,000	10,000,000	<410/<410	< 420	< 410	< 380
Cresol, m & p	51,000	190,000,000	<410/<410	< 420	< 410	< 380
Diallate, Total	1,000	110,000	<410/<410	< 420	< 410	< 380
Dibenzo(a,h)anthracene	160,000	190,000,000	<410/<410	< 420	< 410	< 380
Dibenzofuran	--	--	<410/<410	< 420	< 410	< 380
Diethylphthalate	500,000	10,000,000	<410/<410	< 420	< 410	< 380
Dimethoate	2,000	190,000,000	<410/<410	< 420	< 410	< 380
Dimethylphthalate	--	--	<410/<410	< 420	< 410	< 380
Di-n-butylphthalate	4,100,000	10,000,000	<410/<410	< 420	< 410	< 380
Di-n-octylphthalate	10,000,000	10,000,000	<410/<410	< 420	< 410	< 380
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	<410/<410	< 420	< 410	< 380
Disulfoton	78	8,700	<410/<410	< 420	< 410	< 380
Ethyl methanesulfonate	--	--	<410/<410	< 420	< 410	< 380
Ethyl parathion (Parathion)	360,000	10,000,000	<410/<410	< 420	< 410	< 380
Famphur	--	--	<410/<410	< 420	< 410	< 380
Fluoranthene	3,200,000	190,000,000	<410/<410	< 420	< 410	150J
Fluorene	3,800,000	190,000,000	<410/<410	< 420	< 410	< 380
Hexachlorobenzene	960	190,000,000	<410/<410	< 420	< 410	< 380
Hexachlorobutadiene	1,200	10,000,000	<410/<410	< 420	< 410	< 380
Hexachlorocyclopentadiene	91,000	10,000,000	<410/<410	< 420	< 410	< 380
Hexachloroethane	560	190,000,000	<410/<410	< 420	< 410	< 380
Hexachlorophene	--	--	<210,000/<210,000	< 220,000	< 210,000	< 190,000
Hexachloropropene	--	--	<410/<410	< 420	< 410	< 380
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	<410/<410	< 420	< 410	48J
Isophorone	10,000	10,000,000	<410/<410	< 420	< 410	< 380
Isosafrole	--	--	<410/<410	< 420	< 410	< 380
m-Dinitrobenzene	100	190,000,000	<410/<410	< 420	< 410	< 380
Methapyrilene	--	--	<84,000/<83,000	< 85,000	< 84,000	< 76,000
Methyl methanesulfonate	2,600	190,000,000	<410/<410	< 420	< 410	< 380
Methyl parathion	420	55,000	<410/<410	< 420	< 410	< 380
Naphthalene	25,000	190,000,000	<410/<410	190J	< 410	< 380
Nitrobenzene	5,100	10,000,000	<410/<410	< 420	< 410	< 380
N-Nitrosodiethylamine	1.3	44	<410/<410	< 420	< 410	< 380
N-Nitrosodimethylamine	1.3	130	<410/<410	< 420	< 410	< 380
N-Nitrosodi-n-butylamine	14	10,000,000	<410/<410	< 420	< 410	< 380
n-Nitrosodi-n-propylamine	37	10,000,000	<410/<410	< 420	< 410	< 380
N-Nitrosodiphenylamine	83,000	190,000,000	<410/<410	< 420	< 410	< 380
N-Nitrosomethylethylamine	--	--	<410/<410	< 420	< 410	< 380
N-Nitrosomorpholine	--	--	<410/<410	< 420	< 410	< 380
N-Nitrosopiperidine	--	--	<410/<410	< 420	< 410	< 380
N-Nitrosopyrrolidine	--	--	<410/<410	< 420	< 410	< 380
O,O,O-Triethyl phosphorothioate	--	--	<410/<410	< 420	< 410	< 380
o-Toluidine	1,200	10,000,000	<410/<410	< 420	< 410	< 380
p-(Dimethylamino)azobenzene	150	190,000,000	<410/<410	< 420	< 410	< 380
Pentachlorobenzene	660,000	190,000,000	<410/<410	< 420	< 410	< 380
Pentachloronitrobenzene	20,000	190,000,000	<410/<410	< 420	< 410	< 380
Pentachlorophenol	5,000	190,000,000	<2,100/<2,100	< 2,200	< 2,100	< 1,900
Phenacetin	120,000	190,000,000	<410/<410	< 420	< 410	< 380
Phenol	400,000	190,000,000	<410/<410	< 420	< 410	< 380
Phenanthrene	10,000,000	190,000,000	<410/<410	< 420	< 410	75J
Phorate	880	43,000	<410/<410	< 420	< 410	< 380
Pronamide	5,000	190,000,000	<410/<410	< 420	< 410	< 380
Pyrene	2,200,000	190,000,000	<410/<410	< 420	< 410	130J
Pyridine	2,000	210,000	<410/<410	< 420	< 410	< 380
Safrole	--	--	<410/<410	< 420	< 410	< 380
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	<410/<410	< 420	< 410	< 380
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	<410/<410	< 420	< 410	< 380

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	UP-7 (14-16) 12/11/2003	UP-8 (14-16) 12/12/2003	UP-9 (16.5-18.5) 12/5/2003	V-1 (12.9-14.9) 12/5/2003
Inorganics (mg/kg) [a]						
Antimony	27	190,000	<2.3/<2.4	< 2.3	< 2.4	0.76J
Arsenic	150	190,000	9.4K/10K	9.7	11L	21L
Barium	8,200	190,000	160/120	140	110	110
Beryllium	320	190,000	0.86/0.88	0.95	0.89	1.4
Cadmium	38	190,000	<0.57/<0.59	< 0.56	0.24B	0.43B
Chromium	190,000	190,000	21/17	21	17K	29K
Cobalt	200	190,000	10/13	14	15K	26K
Copper	36,000	190,000	20/21	25	21	48
Lead	450	190,000	13L/14L	16L	15L	19L
Mercury	10	190,000	0.02J/0.02J	0.035	0.024	0.037
Nickel	650	190,000	24/27	29	25	42
Selenium	26	190,000	<1.1L/<1.2L	< 1.1	< 1.2R	< 1.1R
Silver	84	190,000	<1.1/<1.2	< 1.1	< 1.2	< 1.1
Thallium	14	190,000	<1.1/<1.2	< 1.1L	< 1.2L	< 1.1L
Tin	6,100	190,000	1.9B/2B	2.3B	4B	2.2B
Vanadium	72,000	190,000	21/20	30	23	32
Zinc	12,000	190,000	64/68	76	64	97

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	V-2 (17.5-19.5) 12/5/2003	V-3 (15-17) 12/5/2003
Volatile Organic Compounds (ug/kg) [a]				
1,1,1,2-Tetrachloroethane	18,000	190,000,000	< 5.2	< 5.3
1,1,1-Trichloroethane	20,000	10,000,000	< 5.2	< 5.3
1,1,2,2-Tetrachloroethane	30	33,000	< 5.2	< 5.3
1,1,2-Trichloroethane	500	120,000	< 5.2	< 5.3
1,1-Dichloroethane	11,000	1,200,000	< 5.2	< 5.3
1,1-Dichloroethene	190	38,000	< 5.2	< 5.3
1,2,3-Trichloropropane	400,000	950	< 5.2	< 5.3
1,2,4-Trimethylbenzene	20,000	360,000	3,700	< 5.3
1,2-Dibromo-3-chloropropane	20	12,000	< 10	< 10
1,2-Dibromoethane (EDB)	5	8,600	< 5.2	< 5.3
1,2-Dichloroethane	500	73,000	< 5.2	< 5.3
1,2-Dichloropropane	500	180,000	< 5.2	< 5.3
1,3,5-Trimethylbenzene	6,200	360,000	1,800	< 5.3
2-Butanone (Methyl ethyl ketone)	580,000	10,000,000	< 26	< 26
2-Hexanone	-- [d]	--	< 26	< 26
3-Chloropropene (Allylchloride)	4,100	430,000	< 5.2	< 5.3
4-Methyl-2-pentanone (MIBK)	410,000	4,900,000	< 26	< 26
Acetone	1,000,000	10,000,000	42J	28J
Acetonitrile	35,000	3,600,000	< 210	< 210
Acrolein (Propenal)	12	1,200	< 100	< 100
Acrylonitrile	270	28,000	< 100	< 100
Benzene	500	240,000	89	2.7J
Bromodichloromethane	10,000	51,000	< 5.2	< 5.3
Bromoform	10,000	1,700,000	< 5.2	< 5.3
Bromomethane (Methyl Bromide)	1,000	300,000	< 5.2	< 5.3
Carbon disulfide	410,000	10,000,000	< 5.2	< 5.3
Carbon tetrachloride	500	120,000	< 5.2	< 5.3
Chlorobenzene	10,000	10,000,000	< 5.2	< 5.3
Chloroethane	90,000	10,000,000	< 5.2	< 5.3
Chloroform	10,000	19,000	< 5.2	< 5.3
Chloromethane (Methyl Chloride)	300	1,000,000	< 5.2	< 5.3
Chloroprene	4,100	430,000	< 5.2	< 5.3
cis-1,2-Dichloroethene	7,000	2,100,000	< 5.2	< 5.3
cis-1,3-Dichloropropene [c]	2,600	470,000	< 5.2	< 5.3
Dibromochloromethane	--	--	< 5.2	< 5.3
Dibromomethane (Methylene bromide)	20,000	2,100,000	< 5.2	< 5.3
Dichlorodifluoromethane	100,000	10,000,000	< 5.2	< 5.3
Ethyl methacrylate	180,000	190,000,000	< 5.2	< 5.3
Ethylbenzene	70,000	10,000,000	1,400	< 5.3
Iodomethane (Methyl iodide)	--	--	< 5.2	< 5.3
Isobutanol (Isobutyl alcohol)	610,000	10,000,000	< 210	< 210
Methacrylonitrile	410	43,000	< 100	< 100
Methyl methacrylate	410,000	10,000,000	< 5.2	< 5.3
Methylene chloride (Dichloromethane)	500	1,000,000	< 5.2	< 5.3
Pentachloroethane	--	--	< 26	< 26
Propionitrile	--	--	< 100	< 100
Styrene	24,000	10,000,000	21	< 5.3
Tetrachloroethene	500	3,300,000	< 5.2	< 5.3
Toluene	100,000	10,000,000	20	< 5.3
trans-1,2-Dichloroethene	10,000	4,300,000	< 5.2	< 5.3
trans-1,3-Dichloropropene [c]	2,600	470,000	< 5.2	< 5.3
trans-1,4-Dichloro-2-butene	7	190,000,000	< 10	< 10
Trichloroethene	500	1,100,000	< 5.2	1.9J
Trichlorofluoromethane	--	--	< 5.2	< 5.3
Vinyl acetate	120,000	10,000,000	< 10	< 10
Vinyl chloride	200	220,000	< 5.2	< 5.3
Xylenes, Total	1,000,000	10,000,000	530	< 10

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs [(b)] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [(b)] Direct Contact Subsurface Soil 2 - 15 Feet	V-2 (17.5-19.5) 12/5/2003	V-3 (15-17) 12/5/2003
Semivolatile Organic Compounds (ug/kg)				
1,2,4,5-Tetrachlorobenzene	14,000	190,000,000	< 420	< 420
1,2,4-Trichlorobenzene	27,000	10,000,000	< 420	< 420
1,2-Dichlorobenzene (o-Dichlorobenzene)	60,000	10,000,000	< 420	< 420
1,3,5-Trinitrobenzene	--	--	< 420	< 420
1,3-Dichlorobenzene (m-Dichlorobenzene)	61,000	10,000,000	< 420	< 420
1,4-Dichlorobenzene (p-Dichlorobenzene)	10,000	190,000,000	< 420	< 420
1,4-Dioxane	2,400	240,000	< 420	< 420
1,4-Naphthoquinone	--	--	< 420	< 420
1,4-Phenylenediamine (p-Phenylenediamine)	--	--	< 2,200	< 2,200
1-Naphthylamine	1,100	190,000,000	< 420	< 420
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	30,000	190,000	< 420	< 420
2,3,4,6-Tetrachlorophenol	950,000	190,000,000	< 420	< 420
2,4,5-Trichlorophenol	6,100,000	190,000,000	< 420	< 420
2,4,6-Trichlorophenol	8,900	190,000,000	< 420	< 420
2,4-Dichlorophenol	2,000	190,000,000	< 420	< 420
2,4-Dimethylphenol	200,000	10,000,000	< 420	< 420
2,4-Dinitrophenol	4,100	190,000,000	< 2,200	< 2,200
2,4-Dinitrotoluene	840	190,000,000	< 420	< 420
2,6-Dichlorophenol	--	--	< 420	< 420
2,6-Dinitrotoluene	10,000	190,000,000	< 420	< 420
2-Acetylaminofluorene	280	190,000,000	< 420	< 420
2-Chloronaphthalene	18,000,000	190,000,000	< 420	< 420
2-Chlorophenol	4,400	1,100,000	< 420	< 420
2-Methylnaphthalene	8,000,000	10,000,000	150J	< 420
2-Naphthylamine	140	190,000,000	< 420	< 420
2-Nitroaniline (o-Nitroaniline)	580	190,000,000	< 2,200	< 2,200
2-Nitrophenol (o-Nitrophenol)	82,000	190,000,000	< 420	< 420
2-Picoline	--	--	< 420	< 420
3,3'-Dichlorobenzidine	32,000	190,000,000	< 840	< 840
3,3'-Dimethylbenzidine	1,500	10,000,000	< 2,200	< 2,200
3-Methylcholanthrene	--	--	< 420	< 420
3-Nitroaniline (m-Nitroaniline)	580	190,000,000	< 2,200	< 2,200
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	--	< 2,200	< 2,200
4-Aminobiphenyl	12	190,000,000	< 420	< 420
4-Bromophenylphenyl ether	--	--	< 420	< 420
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	110,000	10,000,000	< 420	< 420
4-Chloroaniline (p-Chloroaniline)	52,000	190,000,000	< 840	< 840
4-Chlorophenylphenyl ether	--	--	< 420	< 420
4-Nitroaniline (p-Nitroaniline)	580	190,000,000	< 2,200	< 2,200
4-Nitrophenol (p-Nitrophenol)	6,000	190,000,000	< 2,200	< 2,200
4-Nitroquinoline-1-oxide	--	--	< 4,200	< 4,200
5-Nitro-o-toluidine	--	--	< 420	< 420
7,12-Dimethylbenz(a)anthracene	--	--	< 420	< 420
Acenaphthene	4,700,000	190,000,000	< 420	< 420
Acenaphthylene	6,900,000	190,000,000	< 420	< 420
Acetophenone	1,000,000	10,000,000	< 420	< 420
alpha,alpha-Dimethylphenethylamine	--	--	< 85,000	< 85,000
Aniline	580	600,000	< 420	< 420
Anthracene	350,000	190,000,000	< 420	< 420
Aramite, Total	--	--	< 420	< 420
Benzo(a)anthracene	320,000	190,000,000	< 420	< 420
Benzo(a)pyrene	46,000	190,000,000	< 420	< 420
Benzo(b)fluoranthene	170,000	190,000,000	< 420	< 420
Benzo(g,h,i)perylene	180,000	190,000,000	< 420	< 420
Benzo(k)fluoranthene	610,000	190,000,000	< 420	< 420
Benzyl alcohol	3,100,000	10,000,000	< 420	< 420
bis(2-Chloroethoxy)methane	--	--	< 420	< 420
bis(2-Chloroethyl)ether	55	5,700	< 420	< 420

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: Sample Date: Parameter	PADEP Act 2 MSCs (b) Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs (b) Direct Contact Subsurface Soil 2 - 15 Feet	V-2 (17.5-19.5) 12/5/2003	V-3 (15-17) 12/5/2003
Semivolatile Organic Compounds (continued) (ug/kg)				
bis(2-Ethylhexyl)phthalate	130,000	10,000,000	< 420	< 420
Butylbenzylphthalate	10,000,000	10,000,000	< 420	< 420
Chrysene	230,000	190,000,000	< 420	< 420
Cresol (ortho)	510,000	10,000,000	< 420	< 420
Cresol, m & p	51,000	190,000,000	< 420	< 420
Diallate, Total	1,000	110,000	< 420	< 420
Dibenzo(a,h)anthracene	160,000	190,000,000	< 420	< 420
Dibenzofuran	--	--	< 420	< 420
Diethylphthalate	500,000	10,000,000	< 420	< 420
Dimethoate	2,000	190,000,000	< 420	< 420
Dimethylphthalate	--	--	< 420	< 420
Di-n-butylphthalate	4,100,000	10,000,000	< 420	< 420
Di-n-octylphthalate	10,000,000	10,000,000	< 420	< 420
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	700	190,000,000	< 420	< 420
Disulfoton	78	8,700	< 420	< 420
Ethyl methanesulfonate	--	--	< 420	< 420
Ethyl parathion (Parathion)	360,000	10,000,000	< 420	< 420
Famphur	--	--	< 420	< 420
Fluoranthene	3,200,000	190,000,000	< 420	< 420
Fluorene	3,800,000	190,000,000	< 420	< 420
Hexachlorobenzene	960	190,000,000	< 420	< 420
Hexachlorobutadiene	1,200	10,000,000	< 420	< 420
Hexachlorocyclopentadiene	91,000	10,000,000	< 420	< 420
Hexachloroethane	560	190,000,000	< 420	< 420
Hexachlorophene	--	--	< 220,000	< 220,000
Hexachloropropene	--	--	< 420	< 420
Indeno(1,2,3-cd)pyrene	28,000,000	190,000,000	< 420	< 420
Isophorone	10,000	10,000,000	< 420	< 420
Isosafrole	--	--	< 420	< 420
m-Dinitrobenzene	100	190,000,000	< 420	< 420
Methapyrilene	--	--	< 85,000	< 85,000
Methyl methanesulfonate	2,600	190,000,000	< 420	< 420
Methyl parathion	420	55,000	< 420	< 420
Naphthalene	25,000	190,000,000	2,500	< 420
Nitrobenzene	5,100	10,000,000	< 420	< 420
N-Nitrosodiethylamine	1.3	44	< 420	< 420
N-Nitrosodimethylamine	1.3	130	< 420	< 420
N-Nitrosodi-n-butylamine	14	10,000,000	< 420	< 420
n-Nitrosodi-n-propylamine	37	10,000,000	< 420	< 420
N-Nitrosodiphenylamine	83,000	190,000,000	< 420	< 420
N-Nitrosomethylethylamine	--	--	< 420	< 420
N-Nitrosomorpholine	--	--	< 420	< 420
N-Nitrosopiperidine	--	--	< 420	< 420
N-Nitrosopyrrolidine	--	--	< 420	< 420
O,O,O-Triethyl phosphorothioate	--	--	< 420	< 420
o-Toluidine	1,200	10,000,000	< 420	< 420
p-(Dimethylamino)azobenzene	150	190,000,000	< 420	< 420
Pentachlorobenzene	660,000	190,000,000	< 420	< 420
Pentachloronitrobenzene	20,000	190,000,000	< 420	< 420
Pentachlorophenol	5,000	190,000,000	< 2,200	< 2,200
Phenacetin	120,000	190,000,000	< 420	< 420
Phenol	400,000	190,000,000	< 420	< 420
Phenanthrene	10,000,000	190,000,000	< 420	< 420
Phorate	880	43,000	< 420	< 420
Pronamide	5,000	190,000,000	< 420	< 420
Pyrene	2,200,000	190,000,000	< 420	< 420
Pyridine	2,000	210,000	< 420	< 420
Safrole	--	--	< 420	< 420
Sulfotepp (Tetraethyl dithiopyrophosphate)	1,500	110,000	< 420	< 420
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	--	< 420	< 420

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	PADEP Act 2 MSCs [b] Soil to Groundwater Pathway Used Aquifers, TDS<2,500 mg/L Non-Residential	PADEP Act 2 MSCs [b] Direct Contact Subsurface Soil 2 - 15 Feet	Sample ID: V-2 (17.5-19.5) Sample Date: 12/5/2003	Sample ID: V-3 (15-17) Sample Date: 12/5/2003
Inorganics (mg/kg) [a]				
Antimony	27	190,000	< 2.3	< 2.2
Arsenic	150	190,000	7.3L	9.8L
Barium	8,200	190,000	140	130
Beryllium	320	190,000	0.86	0.87
Cadmium	38	190,000	0.25B	< 0.56
Chromium	190,000	190,000	17K	18K
Cobalt	200	190,000	15K	13K
Copper	36,000	190,000	22	22
Lead	450	190,000	15L	14L
Mercury	10	190,000	0.025	0.025
Nickel	650	190,000	27	25
Selenium	26	190,000	< 1.2R	< 1.1R
Silver	84	190,000	< 1.2	< 1.1
Thallium	14	190,000	< 1.2L	< 1.1L
Tin	6,100	190,000	2.2B	2.4B
Vanadium	72,000	190,000	25	25
Zinc	12,000	190,000	67	68

CUMMINGS RITER

TABLE 8
SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) "ug/kg" is micrograms per kilogram or parts per billion; "mg/kg" is milligrams per kilograms or parts per million.
(b) PADEP statewide health MSCs for regulated substances in soil (Title 25, PA Code Chapter 250).
(c) Medium specific concentration (MSC) is for 1,3-Dichloropropene.
(d) "--" indicates a MSC does not exist for this compound.
(e) "<x" indicates the result is less than the method detection limit (MDL).
(f) Values shaded and shown in **bold** indicate an exceedance of the soil-to-groundwater MSC.
There were no dircect contact MSC exceedances for subsurface soils.
(g) "B" indicates not detected substantially above the level reported in the laboratory or field blanks.
(h) "J" indicates the value is estimated.
(i) "L" indicates the reported value is biased low; actual value is expected to be higher.
(j) "K" indicates the reported value may be biased high; actual value is expected to be lower.
(k) "<x/<x" indicates a duplicate sample was collected at this location.
(l) "R" indicates analyte may or may not be present in the sample.

TABLE 9
SUMMARY OF ANALYTICAL RESULTS OF DETECTED CONSTITUENTS IN GROUNDWATER
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC(a) TDS <2,500 mg/L	E-4	E-24	E-27	E-29	E-33	E-34	E-35	E-37	E-38
		11/2/00	10/30/00	10/31/2000	10/30/2000	10/31/2000	11/3/2000	10/31/2000	11/3/2000	10/31/2000
Inorganics (Total)(µg/L)										
Antimony	6	<10.0	<10.0	<2.9	<10.0	<3.3	<2.8	<6.9	<14.0	<2.7
Arsenic	50	<10.0	<10.0	5.6 B	7.7 B	7.0 B	<10.0	14.1	293	<10.0
Barium	2,000	16.2 B	40.3 B/39.6 B	93.1 B	105 B	368	94.2 B	834	3140	246
Beryllium	4	<0.28	0.27 B/0.30 B	1.1 B	0.70 B	<0.19	<0.24	3.2 B	29	<0.12
Cadmium	5	<5.0	0.71 B/0.76 B	1.8 B	<5.0	0.67 B	0.67 B	17.2	4.1 B	3.3 B
Chromium	100(b)	16.7 J	<5.4	24.2	20.7	10	9.6 J	179	937 J	22.7
Cobalt	2,000	6.3 B	8.2 B/8.5 B	43.4 B	10.1 B	20.6 B	20.0 B	60.2	526	6.6 B
Copper	1,000	15.1 B	<9.0	23.6 B	<16.2	2.5 B	11.5 B	179	722	5.1 B
Lead	5	5.2	2.6 B/3.1	14.8(a)	10.4	<5.5	<4.9	94	504	<5.2
Mercury	2	<0.20	<0.20	<0.065	<0.073	<0.20	<0.19	<0.25	1.1	<0.11
Nickel	100	51.5	44.7/47.9	95.6	16.6 B	9.4 B	<17.6	156	1,190	9.7 B
Selenium	50	3.3 B	2.6 B	<5.0	<5.0	<25.0	<5.0	12.8	<10.0	<10.0
Silver	100	<5.0	<5.0	<5.0	<5.0	4.5 B	<5.0	<5.0	<5.0	2.4 B
Thallium	2	<10.0	<10.0	<10.0	<10.0	<50.0	<10.0	<10.0	<14.2	<20.0
Tin	61,000	<100	<100	26.4 B	<100	<100	<100	<100	<500	<100
Vanadium	720	<50.0	<50.0	24.5 B	<17.5	<50.0	6.4 B	98.2	725	<50
Zinc	2,000	<96.4	32.2/33.1	85.6	55.5	<28.0	<120	398	2,240	<31.1
Volatile Organics (µg/L)										
Acetone	10,000	<4.6	<500	<20.0	<20.0	<35	<5.3	<20.0	<4.2	<40.0
Benzene	5	<5.0	<120	160	<5.0	<25.0	<5.0	<5.0	<5.0	<10.0
2-Butanone	5,800	<5.0	<500	<20	<20	<100	<20.0	<20.0	<5.0	<40.0
Carbon Disulfide	4,100	<5.0	<120	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<10
Chloroform	100	<200	<120	<5.0	<5.0	<25.0	<5.0	<5.0	<5.0	<10.0
1,1-Dichloroethane	110	<5.0	1,700/1,600	<5.0	<5.0	<25.0	<5.0	<5.0	<5.0	<10.0
cis-1,2-Dichloroethene	70	<2.5	3,200/3,200	<2.5	<2.5	<12.0	<2.5	<2.5	<2.5	<5.0
Ethylbenzene	700	2.7 J	<120	<5.0	<5.0	530	1.6 J	<5.0	<5.0	170
Styrene	100	1.9 J	<120	<5.0	<5.0	<25.0	<5.0	<5.0	<5.0	<10.0
Tetrachloroethene	5	<5.0	<120	<5.0	<5.0	<25.0	<5.0	<5.0	<5.0	<10.0
Toluene	1,000	<5.0	<120	<5.0	<5.0	<25.0	<5.0	<5.0	<5.0	<10.0
Trichloroethene	5	<5.0	<120	<5.0	190	<25.0	<5.0	<5.0	<5.0	<10.0
Trichlorofluoromethane	2,000	<10.0	<250	<10.0	<10.0	<50.0	<10.0	<10.0	<10.0	<20.0
Vinyl Chloride	2	<10.0	360/340	<10.0	<10.0	<50.0	<10.0	<10.0	<10.0	<20.0
m-Xylene & p- Xylene	10,000(c)	3.6 J	<120	<5.0	<5.0	210	2.0 J	<5.0	<5.0	<10.0
o-Xylene	10,000(c)	2.9	<62.0	<2.5	<2.5	160	<2.5	<2.5	<2.5	<5.0
Semivolatile Organics (µg/L)										
Acetophenone	10,000	<10.0	<10.0	12	<10.0	35	12	<10.0	<10.0	<10.0
Bis (2-Ethylhexyl) phthalate	6	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Butyl benzyl phthalate	2,700	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
1,4-Dichlorobenzene	75	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
2-Methylnaphthalene	2,000	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	3.2 J	<10.0
Naphthalene	100	<10.0	<10.0	<10.0	<10.0	45	3.8 J	<10.0	<10.0	6.4 J
Phenol	4,000	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Pesticides/Herbicides (µg/L)										
Aldrin	0.037	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
alpha-BHC	0.41	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
beta-BHC	1.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
delta-BHC	61	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4,4'-DDD	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4,4'-DDE	7.6	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,4-D	70	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Dinoseb	7	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Dieldrin	0.16	<0.050	<0.050	<0.050	<0.050	0.0073 J	<0.050	<0.050	<0.050	<0.050
Endosulfan I	500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan II	450	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan sulfate	120	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endrin aldehyde	NL(d)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor	0.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor epoxide	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methoxychlor	40	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
2,4,5-TP (Silvex)	50	<1.0	<1.0	0.22 J	<1.0	0.17 J	<1.0	<1.0	<1.0	<1.0
2,4,5-T	70	<1.0	<1.0	<1.0	<1.0	0.076 J	<1.0	<1.0	<1.0	<1.0
Polychlorinated Biphenyls (µg/L)	0.5	None Detected								
Other (mg/L unless noted otherwise)										
pH (standard units)	--	5.7	5.7 J	5.5 J	7.0 J	6.3 J	6.8	7.9 J	6.6	6.6 J
Ammonia Nitrogen	--	0.24	<0.10/0.11	<0.10	<0.14	0.59	0.1	1.2	1.1	3.9
Chloride	250,000(e)	337	173/173	209	68.8	532	369	24.1	182	444
Total Cyanide (µg/L)	200(f)	10.2 J	<10.0	<10.0	13.4	<10.0	<10.0 UJ	<10.0	<10.0 UJ	<10.0
Fluoride	2,000(e)	0.29	0.088/0.088	0.21	0.26	0.54	0.12	0.33	0.23	0.14
Nitrate	1,000	<0.050	<0.050	<0.078	1.9	<0.050	<0.050	<0.050	2.1	<0.050
Nitrite	1,000	<0.050	<0.050	<0.050	<0.050	<0.25	<0.050	<0.050	<0.050	<0.050
Sulfate	500,000	337	102/103	168	150	27.1	102	135	187	5.7
Total Dissolved Solids	--	785	613/581	647	506	1,460	930	691	596	1,110
Total Organic Carbon	--	6.0	3.1/3.2	3.0	<1.4	9.1	5.8	6.2	2	8.7
Total Petroleum Hydrocarbons	--	<1.0	<1.0	<1.0	<1.0	<1.0	5.9	<1.0	<1.0	<1.0
Total Sulfide	--	<8.5	<42.8	<32.6	<42.8	<31.0	<12.4	<35.7	3.8	<46.0
Hydrocarbons as GRO (µg/L)	--	<100	1,500/260	430	110	8,100	<100	<100	<100	7,100
Hydrocarbons as DRO (µg/L)	--	290	<100 UJ	350 J	<100 UJ	3,300 J	730	570 J	170	3,300 J

CUMMINGS RITER

TABLE 9
SUMMARY OF ANALYTICAL RESULTS OF DETECTED CONSTITUENTS IN GROUNDWATER
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC[a] TDS <2,500 mg/L	E-43	E-46	MW-3	SB-F1/ MW-F1	SB-F2/ MW-F2	SB-F3/ MW-F3	SB-F4/ MWD-F1	SB-F5/ MW-F4	SB-F6/ MW-F5
		10/31/2000	10/31/2000	11/2/2000	10/31/2000	11/1/2000	11/2/2000	11/2/2000	11/2/2000	11/2/2000
Inorganics (Total)(µg/L)										
Antimony	6	<1.7	<2.8	<10.0	<2.6	<10.0	<10.0	<2.3	<10.0	<10.0
Arsenic	50	<10.0	<10.0	<10.0	5.2 B	<10.0	<10.0	2.8 B	4.6 B	4.6 B
Barium	2,000	34.6 B	95.9 B	69.8 B	92.5 B	137 B	533	429	153 B	228
Beryllium	4	<0.12	<5.0	<0.14	<0.50	<0.17	<0.46	0.93 B	<0.12	<0.080
Cadmium	5	<5.0	<5.0	<5.0	<5.0	<5.0	4.5 B	<5.0	<5.0	<5.0
Chromium	100[b]	1.8 B	1,400	6.5 J	17.3	66.3	5.2	6.2	12.8	8.1
Cobalt	2,000	8.8 B	6.0 B	<50.0	7.5 B	5.4 B	63.6	14.6 B	5.9 B	4.8 B
Copper	1,000	3.0 B	9.2 B	17.9 B	10.9 B	<10.7	16.9 B	25.2	2.3 B	4.4 B
Lead	5	<2.4	<3.0	2.0 B	<7.6	5.7	3.3	7.9	3.5	2.1 B
Mercury	2	<0.20	<0.12	<0.12	<0.20	<0.20	<0.046	<0.22	<0.075	<0.20
Nickel	100	15.9 B	172	<40.0	23.8 B	49.8	101	<17.8	<40.0	<12.5
Selenium	50	2.3 B	<5.0	3.2 B	<5.0	3.3 B	2.1 B	<5.0	<10.0	<5.0
Silver	100	<5.0	<5.0	<5.0	<5.0	1.0 B	<5.0	<5.0	1.5 B	<5.0
Thallium	2	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<20.0	<10.0
Tin	61,000	<100	<100	<100	25.1 B	<100	<100	25.1 B	<100	<100
Vanadium	720	<50.0	<8.5	5.0 B	<15.6	<3.5	4.3 B	8.5 B	<50.0	4.6 B
Zinc	2,000	<15.3	<20.3	<23.6	52.2	<29.4	1,530	<33.7	<42	<24.1
Volatile Organics (µg/L)										
Acetone	10,000	<1,000	<20.0	<5.4	<20.0	<30	<59	<6.3	<120	58 J
Benzene	5	<250	<5.0	<5.0	<5.0	<5.0	1.9 J	<5.0	680	110
2-Butanone	5,800	<1,000	<20.0	<20.0	<20.0	<20.0	3.1 J	<200	<500	<200
Carbon Disulfide	4,100	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50.0
Chloroform	100	<250	<5.0	<5.0	<5.0	<5.0	2.3 J	<5.0 UJ	<120 UJ	<50.0 UJ
1,1-Dichloroethane	110	<250	3.6 J	<5.0	<5.0	<5.0	<5.0	<5.0	<120	<50.0
cis-1,2-Dichloroethene	70	<120	3.3	<2.5	<2.5	<2.5	<2.5	<2.5	<62.0	<25.0
Ethylbenzene	700	790	<5.0	<5.0	<5.0	<5.0	34	<5.0	2,500	1,200
Styrene	100	460	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2,300	<50.0
Tetrachloroethene	5	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<120	<50.0
Toluene	1,000	<250	21	<5.0	<5.0	<5.0	12	<5.0	1,400	<50.0
Trichloroethene	5	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<120	<50.0
Trichlorofluoromethane	2,000	<500	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<250	<100.0
Vinyl Chloride	2	<500	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<250	<100.0
m-Xylene & p- Xylene	10,000[c]	1,900	<5.0	<5.0	<5.0	<5.0	18	<5.0	3,000	600
o-Xylene	10,000[c]	1,100	<2.5	<2.5	<2.5	8.2	61	<2.5	2,900	85
Semivolatile Organics (µg/L)										
Acetophenone	10,000	1,700 E/1,600	<10.0	<10.0	<10	<10	8.5 J	<10.0	<500	20
Bis (2-Ethylhexyl) phthalate	6	<50	<10.0	<10.0	<10	<10	6.9 J	<10.0	<500	<10.0
Butyl benzyl phthalate	2,700	<50	<10.0	<10.0	<10	<10	<10.0	<10.0	<500	<10.0
1,4-Dichlorobenzene	75	<50	<10.0	<10.0	<10	<10	<10.0	<10.0	<500	<10.0
2-Methylnaphthalene	2,000	<50	<10.0	<10.0	<10	<10	<10.0	<10.0	<500	<10.0
Naphthalene	100	270/240 J	<10.0	5.3 J	<10	<10	<10.0	<10.0	1,200	28
Phenol	4,000	54	<10.0	<10.0	<10	<10	<10.0	<10.0	<500	<10.0
Pesticides/Herbicides (µg/L)										
Aldrin	0.037	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
alpha-BHC	0.41	0.0030 J	<0.050	<0.050	<0.050	<0.050	0.0022 J	<0.050	0.014 J	0.0029 J
beta-BHC	1.4	0.0081 J	<0.050	<0.050	<0.050	0.0086 J	<0.050	<0.050	<0.050	<0.050
delta-BHC	61	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4,4'-DDD	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4,4'-DDE	7.6	0.0079 J	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,4-D	70	<20	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	1.6 J	<4.0
Dinoseb	7	<3.0	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	0.20 J	<0.60
Dieldrin	0.16	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan I	500	<0.050	<0.050	<0.050	<0.050	0.011 J	<0.050	<0.050	<0.050	<0.050
Endosulfan II	450	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan sulfate	120	0.023 J	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endrin aldehyde	NL[d]	<0.050	<0.050	<0.050	<0.050	0.019 J	<0.050	<0.050	<0.050	<0.050
Heptachlor	0.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor epoxide	0.2	<0.050	<0.050	<0.050	<0.050	0.039 J	<0.050	<0.050	<0.050	<0.050
Methoxychlor	40	<0.10	<0.10	<0.10	<0.10	0.054 J	<0.10	<0.10	<0.10	<0.10
2,4,5-TP (Silvex)	50	<5.0	<1.0	<1.0	<1.0	0.17 J	<1.0	<1.0	0.086 J	<1.0
2,4,5-T	70	<5.0	<1.0	<1.0	<1.0	1.3	<1.0	1.0	<1.0	<1.0
Polychlorinated Biphenyls (µg/L)	0.5	None Detected								
Other (mg/L unless noted otherwise)										
pH (standard units)	--	6.0 J	8.0 J	6.5	6.6 J	6.8	6.0	6.9	6.4	6.1
Ammonia Nitrogen	--	<0.13	<0.2	0.17	<0.10	<0.10	0.29	0.59	0.30	0.14
Chloride	250,000[e]	34.8	450	91.6	254	276	295	120	58.2	66.7
Total Cyanide (µg/L)	200[f]	<10.0	56.9	28 J	18.6	<10.0	<10.0 UJ	<10.0 UJ	18.6 J	<10.0 UJ
Fluoride	2,000[e]	0.2	0.27	0.94	0.31	0.27	0.13	0.21	0.15	0.52
Nitrate	1,000	3.9	<0.050	6.8	3.7	<0.050	0.22	<0.050	<0.050	<0.050
Nitrite	1,000	0.86	<0.050	<0.050	0.16	<0.050	<0.050	<0.050	<0.050	<0.050
Sulfate	500,000	120	273	179	149	148	33.4	84.2	133	23.8
Total Dissolved Solids	--	317	1,400	759	829	951	691	611	553	564
Total Organic Carbon	--	36.4	2.0	12.1	<1.8	12.0	2.1	2.5	18.4	3.2
Total Petroleum Hydrocarbons	--	14.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.7	1.3
Total Sulfide	--	<47.6	<32.6	<1.4	<37.3	<39.7	<9.3	<12.4	<14.8	<9.3
Hydrocarbons as GRO (µg/L)	--	63,000	<100	260	<100	270	740	<100	37,000	6,600
Hydrocarbons as DRO (µg/L)	--	5,9000 J	<100 UJ	3,600	<100 UJ	4,400 J	970	370	28,000	1,200

CUMMINGS RITER

TABLE 9
SUMMARY OF ANALYTICAL RESULTS OF DETECTED CONSTITUENTS IN GROUNDWATER
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC[a] TDS <2,500 mg/L	SB-F7	SB-F8	SB-F9	SB-F10	SB-F11	SB-F12	SB-F13	SB-F14	SB-F15
		10/31/2000	10/31/2000	10/31/2000	11/2/2000	11/2/2000	11/2/2000	11/1/2000	11/1/2000	11/1/2000
Inorganics (Total)(µg/L)										
Antimony	6	<4.0	<1.5	<10	<10.0	<1.6	<10.0	<10.0	<10.0	<1.7
Arsenic	50	57.5	<10.0	13.6	4.0 B	<10.0	<10.0	40.3	18.9	38.6
Barium	2,000	483	138 B	205	125 B	39.1 B	48.8 B	323	156 B	319
Beryllium	4	5.2	<0.24	1.3 B	<0.56	<0.080	<0.080	3.4 B	1.5 B	3.7 B
Cadmium	5	<5.0	0.57 B	<5.0	0.60 B	<5.0	<5.0	0.83 B	2.8 B	<5.0
Chromium	100[b]	839	57.1	316	6.1	2.3 B	1.8 B	690	329	649
Cobalt	2,000	93.8	18.2 B	57.9	7.0 B	<50.0	<50.0	96.4	24.3 B	72.2
Copper	1,000	152	16.9 B	57.4	11.8 B	<25.0	<25.0	103	35.5	97.6
Lead	5	73.1	10.6	30.5	8.8	<3.0	2.4 B	56.9	21.4	66.4
Mercury	2	<0.26	<0.097	<0.045	<0.13	<0.050	<0.20	<0.10	<0.20	<0.14
Nickel	100	658	61.8	269	<19.1	<40.0	<40.0	592	391	461
Selenium	50	<5.0	<5.0	<25.0	2.1 B	6.4	<5.0	8.7	<5.0	7.1
Silver	100	<5.0	0.99 B	2.9 B	<5.0	<5.0	<5.0	6.7	<5.0	4.1 B
Thallium	2	<10.0	<10.0	<50.0	<10.0	<10.0	<6.1	<10.0	<10.0	<10.0
Tin	61,000	24.2 B	<100	<100	<100	<100	<100	<100	<100	<100
Vanadium	720	140	<5.4	30.6 B	6.4 B	4.0 B	4.8 B	86.5	32.7 B	99.3
Zinc	2,000	401	64.0	318	<44.4	<9.5	<297	335	324	310
Volatile Organics (µg/L)										
Acetone	10,000	<20.0	<13	<20	<6.3	<6.5	<5.6	<8.5	<6.5	<6.2
Benzene	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Butanone	5,800	<20	<20	<20	<20	<20.0	<20	<20	<20	<20
Carbon Disulfide	4,100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	100	<5.0	<5.0	<5.0	<5.0 UJ	<5.0 UJ	<5.0 UJ	<5.0	<5.0	<5.0
1,1-Dichloroethane	110	<5.0	<5.0	11	<5.0	<5.0	<5.0	1.7 J	<5.0	<5.0
cis-1,2-Dichloroethene	70	<2.5	<2.5	84	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Ethylbenzene	700	<5.0	<5.0	<5.0	1.4 J	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	100	<5.0	<5.0	<5.0	13	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	5	<5.0	<5.0	3.0 J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	1,000	<5.0	<5.0	<5.0	1.7 J	<5.0	<5.0	<5.0	<5.0	<5.0
Trichloroethene	5	<5.0	11	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Trichlorofluoromethane	2,000	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Vinyl Chloride	2	<10.0	<10.0	2.4 J	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
m-Xylene & p- Xylene	10,000[c]	<5.0	<5.0	<5.0	6.1	<5.0	<5.0	<5.0	<5.0	<5.0
o-Xylene	10,000[c]	<2.5	<2.5	<2.5	34	<2.5	<2.5	<2.5	<2.5	<2.5
Semivolatile Organics (µg/L)										
Acetophenone	10,000	18	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Bis (2-Ethylhexyl) phthalate	6	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Butyl benzyl phthalate	2,700	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
1,4-Dichlorobenzene	75	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
2-Methylnaphthalene	2,000	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Naphthalene	100	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Phenol	4,000	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Pesticides/Herbicides (µg/L)										
Aldrin	0.037	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
alpha-BHC	0.41	<0.050	<0.050	<0.050	0.014 J	<0.050	<0.050	<0.050	<0.050	<0.050
beta-BHC	1.4	0.013 J	<0.050	<0.050	0.0044 J	<0.050	<0.050	<0.050	<0.050	<0.050
delta-BHC	61	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4,4'-DDD	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4,4'-DDE	7.6	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,4-D	70	<4.0	<4.0	3.5 J	<4.0	0.20 J	<4.0	<4.0	<4.0	<4.0
Dinoseb	7	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Dieldrin	0.16	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan I	500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan II	450	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan sulfate	120	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Endrin aldehyde	NL[d]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor	0.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor epoxide	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methoxychlor	40	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
2,4,5-TP (Silvex)	50	<1.0	0.080 J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-T	70	<1.0	<1.0	<1.0	0.10 J	<1.0	<1.0	<1.0	<1.0	<1.0
Polychlorinated Biphenyls (µg/L)	0.5	None Detected								
Other (mg/L unless noted otherwise)										
pH (standard units)	--	6.6 J	6 J	6.0	6.8	6.7	6.8	5.8	5.5	8.0
Ammonia Nitrogen	--	<0.10	<0.2	<1.8	0.38	<0.10	0.12	<0.16	<0.1	<0.12
Chloride	250,000[e]	364	151	125	59.6	42.9	31.0	156	410	129
Total Cyanide (µg/L)	200[f]	22.2	<10.0	11.9	<10.0 UJ	33.9 J	<10.0 UJ	<10.0	<10.0	<10.0
Fluoride	2,000[e]	0.17	0.11	0.13	0.18	1.1	0.25	0.21	0.34	0.74
Nitrate	1,000	1.8	0.85	<0.38	<0.050	3.1	1.8	<0.26	5.9	<0.34
Nitrite	1,000	0.30	0.12	0.091	<0.050	0.051	<0.050	0.10	<0.050	<0.050
Sulfate	500,000	249	131	319	185	232	110	324	189	192
Total Dissolved Solids	--	1,040	504	661	512	474	356	758	1,220	968
Total Organic Carbon	--	2.8	2.9	8.2	9.2	2.2	<0.70	<1.1	<0.47	2.3
Total Petroleum Hydrocarbons	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Sulfide	--	<37.3	<44.4	<43.6	<14.8	<16.3	<10	<42.8	<42.8	<34.9
Hydrocarbons as GRO (µg/L)	--	<100	<100	<100	1,100	<100	<100	<100	<100	<100
Hydrocarbons as DRO (µg/L)	--	630 J	320 J	330 J	2,100	410	<100	100 J	<100 UJ	<100 UJ

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TABLE 9
SUMMARY OF ANALYTICAL RESULTS OF DETECTED CONSTITUENTS IN GROUNDWATER
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Analyte	PADEP MSC[a] TDS <2,500 mg/L	SB-F16	SB-F17	SB-F18	SB-F19	SB-F21	SB-F22	SB-F23	W-1A	W-2A	W-15
		11/1/2000	11/1/2000	11/1/2000	11/1/00	10/31/00	11/1/00	11/2/00	11/2/00	11/2/00	11/3/00
Inorganics (Total)(µg/L)											
Antimony	6	<7.7	<10.0	<1.8	<2.3	<7.9	<3.0	<2.0	<10.0	<10.0	<2.0
Arsenic	50	168	45.1	22.4	30.5	140	29.7	16.1	<10.0	<10.0	6.0 B
Barium	2,000	1,930	458	377	449	1,850	509	421	19.3 B	195 B	172 B
Beryllium	4	18.0	<0.38	1.5 B	3.1 B	14.0	2.4 B	0.83 B	<5.0	<0.12	<0.22
Cadmium	5	1.6 B	<5.0	<5.0	<5.0	<5.0	<5.0	1.4 B	<5.0	<5.0	<5.0
Chromium	100[b]	665	117	163	79.2	523	89.6	20.1 J	4.4 J	2.0 J	24 J
Cobalt	2,000	298	50.4	27.6 B	48.3 B	245	72.9	22.4 B	3.9 B	7.7 B	101
Copper	1,000	467	<17.8	39.3	67.7	386	75.5	14.4 B	4.0 B	<25.0	21.7 B
Lead	5	259	3.2	45.2	45.8	207	49.8	26.8	4.2	<3.0	<9.2
Mercury	2	0.64	<0.20	<0.20	<0.082	<0.55	<0.17	<0.14	<0.080	<0.069	<0.14
Nickel	100	779	64.2	122	80.8	566	96.9	42.1	<40.0	<40.0	<13.7
Selenium	50	<10.0	14.2	3.9 B	3.2 B	<10.0	15.0 B	2.8 B	2.4 B	<5.0	<50.0
Silver	100	<5.0	10.5	1.3 B	<5.0	<5.0	4.0 B	<5.0	<5.0	<5.0	9.3
Thallium	2	<20.0	<10.0	<10.0	<10.0	<20.0	<50.0	<10.0	<10.0	<10.0	<100
Tin	61,000	<200	<100	<100	<100	<200	<100	<100	<100	<100	<100
Vanadium	720	496	<8.7	40.4 B	87.7	381	68.8	11.1 B	<50.0	<50.0	<50.0
Zinc	2,000	1,500	35.6	126	222	1,130	227	<93.5	<127	<260	<56.2
Volatile Organics (µg/L)											
Acetone	10,000	<6.7	<8.7	56 J,B	<4.9	<20.0	170 J,B	<9.8	<6.4	<7.3	800 B
Benzene	5	<5.0	<5.0	17 J	<5.0	<5.0	730	<5.0	<5.0	23	6,200
2-Butanone	5,800	<20	<20	<100	<20	<20.0	<600	<20.0	<20.0	<20.0	<500
Carbon Disulfide	4,100	<5.0	<5.0	<25	<5.0	<5.0	<150	5.1	<5.0	<5.0	<120
Chloroform	100	<5.0	<5.0	<25	<5.0	<5.0	<150	<5.0	<5.0	<5.0	<120
1,1-Dichloroethane	110	<5.0	<5.0	<25	<5.0	<5.0	<150	<5.0	<5.0	<5.0	<120
cis-1,2-Dichloroethene	70	<2.5	<2.5	<12	<2.5	<2.5	<175	<2.5	<2.5	<2.5	<62.0
Ethylbenzene	700	<5.0	<5.0	530	<5.0	<5.0	3,600	3.6 J	<5.0	79	19,000
Styrene	100	<5.0	<5.0	<25	<5.0	<5.0	<150	<5.0	<5.0	<5.0	<120
Tetrachloroethene	5	<5.0	<5.0	<25	<5.0	<5.0	<150	<5.0	<5.0	<5.0	<120
Toluene	1,000	<5.0	<5.0	<25	<5.0	<5.0	940	<5.0	<5.0	<5.0	820
Trichloroethene	5	<5.0	<5.0	<25	<5.0	<5.0	<150	<5.0	<5.0	<5.0	<120
Trichlorofluoromethane	2,000	<10.0	<10.0	<50	<10.0	<10.0	<300	<10.0	<10.0	<10.0	7,100
Vinyl Chloride	2	<10.0	<10	<50	<10	<10.0	<300	<10.0	<10.0	<10.0	<250
m-Xylene & p- Xylene	10,000[c]	<5.0	<5.0	<25	<5.0	<5.0	3,600	3.8 J	<5.0	<5.0	10,000
o-Xylene	10,000[c]	<2.5	<2.5	360	<2.5	<2.5	3,200	3	<2.5	9	15,000
Semivolatile Organics (µg/L)											
Acetophenone	10,000	<10.0	<10.0	<10.0	<10.0	<18.0	NA	<10.0	<10.0	<10.0	<200
Bis (2-Ethylhexyl) phthalate	6	<10.0	<10.0	<10.0	<10.0	<18.0	NA	<10.0	<10.0	<10.0	<200
Butyl benzyl phthalate	2,700	<10.0	<10.0	<10.0	<10.0	<18.0	NA	<10.0	<10.0	4.4 J	<200
1,4-Dichlorobenzene	75	<10.0	5.5 J	<10.0	<10.0	<18.0	NA	<10.0	<10.0	<10.0	<200
2-Methylnaphthalene	2,000	<10.0	<10.0	34	<10.0	<18.0	NA	<10.0	<10.0	30	90 J
Naphthalene	100	<10.0	<10.0	410 E/1,100	<10.0	<18.0	NA	5.4 J	9.8 J	420 E/750	1,500
Phenol	4,000	<10.0	<10.0	<10.0	<10.0	<18.0	NA	<10.0	<10.0	6.7 J	<200
Pesticides/Herbicides (µg/L)											
Aldrin	0.037	<0.050	<0.050	<0.050	0.0033J	<0.050	NA	<0.050	<0.050	0.0033 J	<0.050
alpha-BHC	0.41	<0.050	<0.050	0.0067 J	0.0037 J	<0.050	NA	<0.050	<0.050	0.0027 J	<0.050
beta-BHC	1.4	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	<0.050
delta-BHC	61	<0.050	<0.050	<0.050	0.0054 J	<0.050	NA	<0.050	<0.050	<0.050	<0.050
4,4'-DDD	2.7	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	0.0093 J	<0.050
4,4'-DDE	7.6	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	0.014 J
2,4-D	70	<4.0	<4.0	<4.0	3.7 J	<4.0	NA	<4.0	<4.0	0.68 J	<4.0
Dinoseb	7	<0.60	<0.60	<0.60	<0.60	<0.60	NA	<0.60	<0.60	<0.60	0.24 J
Dieldrin	0.16	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	<0.050
Endosulfan I	500	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	<0.050
Endosulfan II	450	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	0.031 J
Endosulfan sulfate	120	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	<0.050
Endrin aldehyde	NL[d]	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	<0.050
Heptachlor	0.4	<0.050	<0.050	<0.050	<0.050	<0.050	NA	<0.050	<0.050	<0.050	0.019 J
Heptachlor epoxide	0.2	<0.050	<0.050	<0.050	0.011 J	<0.050	NA	<0.050	<0.050	<0.050	<0.050
Methoxychlor	40	<0.10	<0.10	<0.10	<0.10	<0.10	NA	<0.10	<0.10	<0.10	<0.10
2,4,5-TP (Silvex)	50	<1.0	<1.0	0.17 J	0.16 J	<1.0	NA	<1.0	<1.0	<1.0	0.29 J
2,4,5-T	70	<1.0	<1.0	0.078 J	15	<1.0	NA	<1.0	<1.0	<1.0	0.59 J
Polychlorinated Biphenyls (µg/L)	0.5	None Detected									
Other (mg/L unless noted otherwise)											
pH (standard units)	--	7.2	7.3	6.8	6.8	7.0 J	NA	6.2	7.0	6.6	6.3
Ammonia Nitrogen	--	<0.47	57.9	<2.7	<0.11	<0.37	NA	5.1	0.96	3.7	0.6
Chloride	250,000[e]	26.3	96.9	111	119	172	118	38.7	<1.0	46.9	1,260
Total Cyanide (µg/L)	200[f]	10.0	<10.0	<10.0	<10.0	24.6	<10.0	39.5 J	24.2 J	<10.0 UJ	22.9 J
Fluoride	2,000[e]	0.21	2.6	0.67	0.36	0.29	0.33	0.22	0.33	0.31	0.16
Nitrate	1,000	9.7	<0.050	<0.050	0.23	2.0	<0.050	<0.050	0.085	<0.050	<0.050
Nitrite	1,000	<0.050	<0.050	<0.050	<0.050	0.34	<0.050	<0.050	<0.050	<0.050	<0.050
Sulfate	500,000	123	82.5	53.7	132	176	94.9	57.9	9.8	1.1	132
Total Dissolved Solids	--	443	364	576	708	769	814	403	54.0	387	2,910
Total Organic Carbon	--	1.4	3.0	17.1	6.0	<0.77	74.1	9.2	4.0	21.7	2.2
Total Petroleum Hydrocarbons	--	<1.0	<1.0	19.8	<1.0	<1.0	NA	<1.0	<1.0	3.8	5.2
Total Sulfide	--	<36.5	<37.3	<39.7	<38.9	<41.2	NA	<10.0	<2.2	<4.0	<6.1
Hydrocarbons as GRO (µg/L)	--	<100	<100	13,000	<100	<100	44,000	<100	<100	4,900	22,000
Hydrocarbons as DRO (µg/L)	--	<100 UJ	750 J	17,000 J	2,600 J	<100 UJ	NA	660	2,000	16,000	25,000

CUMMINGS RITER

TABLE 9
SUMMARY OF ANALYTICAL RESULTS OF DETECTED CONSTITUENTS IN GROUNDWATER
ARCADIS GERAGHTY AND MILLER (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) PADEP medium specific concentration (MSC), non-residential, used aquifer (Pennsylvania Bulletin, Volume 31, No. 47, November 24, 2001)
(b) Total chromium MSC.
(c) MSC for total xylenes.
(d) A MSC does not exist for this constituent.
(e) Secondary MCL.
(f) Value Based on Free Cyanide.
(g) Shaded values indicate an exceedance of corresponding MSC.

Legend:

< = Less than (constituent was not detected above the sample-specific detection limit shown).
B = Metals: estimated result; result is less than n mg/L = milligrams per liter
Organics: analyte detected in an associated blank.
E = Metals: the value is estimated because of the presence of interference.
Organics: compound exceeds the calibration range of the GC/MS instrument.
J = Estimated result.
UJ = Analyzed but not detected; estimated.
NA = Not analyzed.
mg/L = Milligrams per liter.
ug/L = Micrograms per liter.

TABLE 10
SUMMARY OF ANALYTICAL RESULTS OF DETECTED CONSTITUENTS IN GROUNDWATER SAMPLES
KU RESOURCES (2000)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameters	PADEP MSC[(a)] TDS<2,500 mg/L	Sample ID					
		E28D	E31	E37[(b)]	E38	E39A	W2A
Volatile Organic Compounds (ug/L)[(c)]							
Benzene	5	<1	<2	<1	<50	<1	51.7[(d)]
n-Butylbenzene	4,100	<1	26.3	<1	<50	<1	<2
sec-Butylbenzene	4,100	<1	<2	<1	<50	<1	<2
Ethylbenzene	700	<1	417	<1	172	3.7	327
Isopropylbenzene	2,300	<1	253	<1	415	4.6	158
p-Isopropyltoluene	NL	<1	37.8	<1	<50	3	<2
Napthalene	100	<1	528	<1	169	23	978
n-Propylbenzene	4,100	<1	532	<1	1,230	5.9	191
Toluene	1,000	<1	46.5	<1	<50	3.7	<2
1,2,4-Trimethylbenzene	35	<1	2,410	<1	2,940	38.8	1,610
1,3,5-Trimethylbenzene	35	<1	588	<1	81.2	11.9	107
Xylenes, Total	10,000	<3	701	<3	<150	11.6	262
m,p-Xylenes	NL	<2	160	<2	<100	5.7	262
o-Xylene	NL	<1	541	<1	<50	5.9	<2
Semivolatile Organic Compounds (ug/L)							
Anthracene	66	<10	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	75	<10	30	<10	<10	<10	<10
Phenanthrene	1,100	<10	<10	<10	<10	<10	<10
2-Methylnapthalene	2,000	<10	<10	<10	<10	<10	50
PCBs (µg/L)	0.5	None Detected					
Others							
Total dissolved solids (mg/L)		1,084	1,871	6,765	1,178	2,439	627.4
Inorganics (Total) (ug/L)							
Arsenic	50	<5	50	405	8	<5	<5
Barium	2,000	460	440	1,100	490	90	310
Chromium (total)	100[(e)]	20	30	210	40	10	30
Lead	5	20	<10	160	20	<10	<10
Mercury	2	<0.5	<0.5	1.4	<0.5	<0.5	0.8
Selenium	50	<5	6	<5	5	8	<5
Silver	100	<10	<10	<10	10	10	<10
Copper	1,000	40	10	550	120	<10	80
Nickel	100	<10	20	400	30	<10	50
Zinc	2,000	60	80	690	140	40	3,390
Aluminum	200[(f)]	1,700	2,980	79,500	5,340	630	1,600
Calcium	NL[(g)]	169,000	229,000	96,000	115,000	65,800	85,200
Cobalt	2,000	20	<10	170	50	<10	10
Iron	300[(f)]	23,300	9,640	208,000	84,900	780	90,500
Potassium	NL	1,440	18,700	11,800	4,890	12,200	6,400
Magnesium	NL	25,500	18,300	47,900	11,200	8,380	14,000
Manganese	50[(g)]	1,450	2,290	9,090	17,800	460	3,010
Sodium	NL	99,100	250,000	81,700	139,000	547,000	31,900
Antimony	6	<5	<5	13	<5	<5	<5
Vanadium	720	10	20	180	30	<10	10

Notes:

(a) PADEP medium-specific concentration (MSC), non-residential used aquifer (Pennsylvania Bulletin, Volume 31, No. 47, November 24, 2001).
(b) TDS value >2500 mg/L.
(c) "ug/L" is micrograms per liter or parts per billion.
(d) Values shaded indicate a MSC exceedance.
(e) MSC for total chromium.
(f) Represents secondary maximum contaminant level and a MSC does not exist for this constituent.
(g) A MSC does not exist for this constituent.

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-3AD 1/29/2004	E-3AD 1/29/2004	E-8D 1/30/2004	E-8D 3/2/2004	E-12 1/26/2004	E-13D 1/27/2004	E-13D 3/1/2004	E-14 1/29/2004	E-15 1/26/2004
Volatile Organic Compounds (ug/L) [a]										
1,1,1,2-Tetrachloroethane	70	< 1[d]	<1/<1[e]	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	200	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	0.3	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane	110	< 1	<1/<1	0.68B	< 1	0.51J	< 1	< 1	< 1	< 1
1,1-Dichloroethene	7	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromo-3-chloropropane	0.2	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	0.05	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-Trichloropropane	40	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	35	0.52J[f]	0.45B[g]/0.48B	< 1	< 1	< 1	0.76B	< 1	14	0.49B
1,3,5-Trimethylbenzene	35	< 1	0.33J/0.33J	< 1	< 1	< 1	0.24J	< 1	< 1	< 1
2-Butanone (Methyl ethyl ketone)	5,800	1.8J	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Hexanone	--[c]	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Chloropropene (Allylchloride)	41	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
4-Methyl-2-pentanone (MIBK)	410	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetone	10,000	< 25	<25/<25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
Acetonitrile	350	< 40	<40/<40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Acrolein (Propenal)	0.12	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Acrylonitrile	2.7	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Benzene	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane (Methyl Bromide)	10	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon disulfide	4,100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	900	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane (Methyl Chloride)	3	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroprene	41	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	70	< 1	<1/<1	0.83J	< 1	< 1	< 1	< 1	< 1	< 1
cis-1,3-Dichloropropene	26	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	--	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane (Methylene bromide)	200	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dichlorodifluoromethane	1,000	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl methacrylate	1,800	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	700	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Iodomethane (Methyl iodide)	--	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Isobutanol (Isobutyl alcohol)	6,100	< 40	<40/<40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Methacrylonitrile	4.1	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl methacrylate	4,100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methylene chloride (Dichloromethane)	5	< 5	<5/<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Pentachloroethane	--	< 5	<5/<5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Propionitrile	--	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Styrene	100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	1,000	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,2-Dichloroethene	100	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	26	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,4-Dichloro-2-butene	0.069	< 2	<2/<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Trichloroethene	5	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	--	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl acetate	1,200	< 2	<2/<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Vinyl chloride	2	< 1	<1/<1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Xylenes, Total	10,000	< 2	<2/<2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-3AD 1/29/2004		E-8D 1/30/2004	E-8D 3/2/2004	E-12 1/26/2004	E-13D 1/27/2004	E-13D 3/1/2004	E-14 1/29/2004	E-15 1/26/2004
Semivolatile Organic Compounds (ug/l)										
1,2,4-Trichlorobenzene	70	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dioxane	24	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Naphthoquinone	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	<2,000/<2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-Trichlorophenol	10,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,6-Trichlorophenol	31	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dichlorophenol	20	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dimethylphenol	2,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dinitrophenol	41	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	8.4	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dichlorophenol	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	100	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Acetylaminofluorene	0.68	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	8,200	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorophenol	40	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	2,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Naphthylamine	1.4	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Picoline	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3-Methylcholanthrene	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Aminobiphenyl	0.12	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthene	3,800	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthylene	6,100	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetophenone	10,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	8.4J
alpha,alpha-Dimethylphenethylamine	--	< 2,000	<2,000/<2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Aniline	5.8	< 20	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Anthracene	66	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aramite, Total	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)anthracene	3.6	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)pyrene	0.2	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene	1.2	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(g,h,i)perylene	0.26	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(k)fluoranthene	0.55	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzyl alcohol	31,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	< 10	<10/<10	3.4J	< 10	< 10	8J[b]	< 10	< 10	< 10
Butylbenzylphthalate	2,700	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chrysene	1.9	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol (ortho)	5,100	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol, m & p	510	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diallate, Total	10	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzofuran	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylphthalate	5,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethoate	20	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethylphthalate	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-butylphthalate	10,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-octylphthalate	2,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Disulfoton	0.3	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl methanesulfonate	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl parathion (Parathion)	610	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Famphur	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoranthene	260	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluorene	1,900	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobenzene	1	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	1	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	50	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachloroethane	1	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[(b)] Used Aquifers, TDS≤2,500 Non-Residential	E-3AD 1/29/2004		E-8D 1/30/2004	E-8D 3/2/2004	E-12 1/26/2004	E-13D 1/27/2004	E-13D 3/1/2004	E-14 1/29/2004	E-15 1/26/2004
Semivolatile Organic Compounds con'd. (ug/l)										
Hexachlorophene	--	< 5,000	<5,000/<5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isophorone	100	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isosafrole	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
m-Dinitrobenzene	1	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methapyrilene	--	< 2,000	<2,000/<2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl parathion	2	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	100	3.2J	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Nitrobenzene	51	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiethylamine	0.0043	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodimethylamine	0.013	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiphenylamine	530	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomorpholine	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopiperidine	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
o-Toluidine	11	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorobenzene	82	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachloronitrobenzene	10	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorophenol	1	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Phenacetin	1,200	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenanthrene	1,100	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenol	4,000	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phorate	4.1	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pronamide	50	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyrene	130	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyridine	20	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Safrole	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dissolved Metals (ug/l)										
Antimony (Dissolved)	6	< 20L[(i)]	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Arsenic, (Dissolved)	50	21K[(j)]	29L/28L	14L	15L	< 10	< 10	5.8L	< 10L	< 10
Barium, (Dissolved)	2,000	660	680/670	83	85	72	110	240	290	59
Beryllium (Dissolved)	4	< 4	<4/<4	< 4	< 4	< 4	< 4	< 4	0.51J	< 4
Cadmium (Dissolved)	5	< 5	<5/<5	< 5	< 5	2.3J	< 5	< 5	2.2J	< 5
Chromium, (Dissolved)	100	< 10	1.5B/<10	< 10	< 10	3B	< 10	< 10	< 10	3.2B
Cobalt (Dissolved)	2,000	< 10	<10/<10	< 10	< 10	84	< 10	< 10	10	14
Copper, Dissolved	1,000	< 20	<20/<20	< 20	< 20	7.1J	< 20	< 20	2.7J	3.1J
Lead, (Dissolved)	5	< 5	4B/<5L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L
Mercury (Dissolved)	2	< 0.2	<0.2L/<0.2L	< 0.2	< 0.2L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel, (Dissolved)	100	< 40	<40/<40	< 40	< 40	110	< 40	< 40	77	16J
Selenium (Dissolved)	50	< 10	<10L/<10L	< 10	< 10L	< 10	< 10	< 10L	< 10	< 10
Silver (Dissolved)	100	< 10	<10/<10	< 10	< 10	< 10L	< 10L	< 10	< 10	< 10L
Thallium (Dissolved)	2	< 10	<10L/<10L	< 10L	< 10L	< 10L	< 10L	< 10	< 10L	< 10L
Tin (Dissolved)	61,000	< 50	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Vanadium (Dissolved)	720	< 10	0.91B/<10	< 10	1.2B	< 10	< 10	< 10	< 10	< 10
Zinc, (Dissolved)	2,000	3.8B	4.6B/5.9B	17J	3.3B	130	7.2B	4.3B	58	6.4B
Total Dissolved Solids (ug/l)	--	520	NA	570	NA	640	500	NA	610	670

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-17D 1/30/2004	E-17D 3/1/2004	E-21 3/1/2004	E-23 1/27/2004	E-24 1/30/2004	E-27 2/4/2004	E-28D 2/5/2004	E-28D 3/1/2004	E-29 2/2/2004
Volatile Organic Compounds (ug/L) [a]										
1,1,1,2-Tetrachloroethane	70	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,1,1-Trichloroethane	200	< 1	< 1	< 1	< 1	41	< 5	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	0.3	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,1-Dichloroethane	110	< 1	< 1	1.6	< 1	1,400	< 5	< 1	< 1	< 1
1,1-Dichloroethene	7	< 1	< 1	< 1	< 1	67	< 5	< 1	< 1	< 1
1,2-Dibromo-3-chloropropane	0.2	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	0.05	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,2-Dichloroethane	5	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,2,3-Trichloropropane	40	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
1,2,4-Trimethylbenzene	35	< 1	< 1	0.67J	0.21B	< 20	43	5.6	< 1	< 1
1,3,5-Trimethylbenzene	35	< 1	< 1	0.37J	< 1	< 20	23	2.6	< 1	< 1
2-Butanone (Methyl ethyl ketone)	5,800	< 10	< 10	< 10	< 10	< 200	< 50	< 10	< 10	< 10
2-Hexanone	--[c]	< 10	< 10	< 10	< 10	< 200	< 50	< 10	< 10	< 10
3-Chloropropene (Allylchloride)	41	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
4-Methyl-2-pentanone (MIBK)	410	< 10	< 10	< 10	< 10	< 200	< 50	< 10	< 10	< 10
Acetone	10,000	< 25	< 25	< 25	< 25	< 500	< 120	< 25	< 25	< 25
Acetonitrile	350	< 40	< 40	< 40	< 40	< 800	< 200	< 40	< 40	< 40
Acrolein (Propenal)	0.12	< 20	< 20	< 20	< 20	< 400	< 100	< 20	< 20	< 20
Acrylonitrile	2.7	< 20	< 20	< 20	< 20	< 400	< 100	< 20	< 20	< 20
Benzene	5	< 1	< 1	< 1	< 1	10J	140	< 1	< 1	< 1
Bromodichloromethane	100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Bromoform	100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Bromomethane (Methyl Bromide)	10	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Carbon disulfide	4,100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Carbon tetrachloride	5	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Chloroethane	900	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Chloroform	100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Chloromethane (Methyl Chloride)	3	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Chloroprene	41	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
cis-1,2-Dichloroethene	70	< 1	< 1	< 1	< 1	3,600	< 5	< 1	< 1	< 1
cis-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Dibromochloromethane	--	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Dibromomethane (Methylene bromide)	200	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Dichlorodifluoromethane	1,000	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Ethyl methacrylate	1,800	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Ethylbenzene	700	< 1	< 1	< 1	< 1	< 20	19	0.42J	< 1	< 1
Iodomethane (Methyl iodide)	--	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Isobutanol (Isobutyl alcohol)	6,100	< 40	< 40	< 40	< 40	< 800	< 200	< 40	< 40	< 40
Methacrylonitrile	4.1	< 20	< 20	< 20	< 20	< 400	< 100	< 20	< 20	< 20
Methyl methacrylate	4,100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Methylene chloride (Dichloromethane)	5	< 5	< 5	< 5	< 5	< 100	< 25	< 5	< 5	< 5
Pentachloroethane	--	< 5	< 5	< 5	< 5	< 100	< 25	< 5	< 5	< 5
Propionitrile	--	< 20	< 20	< 20	< 20	< 400	< 100	< 20	< 20	< 20
Styrene	100	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Tetrachloroethene	5	< 1	< 1	< 1	< 1	20	< 5	< 1	< 1	< 1
Toluene	1,000	< 1	< 1	< 1	< 1	< 20	43	< 1	< 1	< 1
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	16J	< 5	< 1	< 1	< 1
trans-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
trans-1,4-Dichloro-2-butene	0.069	< 2	< 2	< 2	< 2	< 40	< 10	< 2	< 2	< 2
Trichloroethene	5	< 1	< 1	< 1	< 1	22	< 5	< 1	< 1	330
Trichlorofluoromethane	--	< 1	< 1	< 1	< 1	< 20	< 5	< 1	< 1	< 1
Vinyl acetate	1,200	< 2	< 2	< 2	< 2	< 40	< 10	< 2	< 2	< 2
Vinyl chloride	2	< 1	< 1	< 1	< 1	370	< 5	< 1	< 1	< 1
Xylenes, Total	10,000	< 2	< 2	< 2	< 2	< 40	68	1.3J	< 2	< 2

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[(b)] Used Aquifers, TDS≤2,500 Non-Residential	E-17D 1/30/2004	E-17D 3/1/2004	E-21 3/1/2004	E-23 1/27/2004	E-24 1/30/2004	E-27 2/4/2004	E-28D 2/5/2004	E-28D 3/1/2004	E-29 2/2/2004
Semivolatile Organic Compounds (ug/l)										
1,2,4-Trichlorobenzene	70	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dioxane	24	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Naphthoquinone	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-Trichlorophenol	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,6-Trichlorophenol	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dichlorophenol	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dimethylphenol	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dinitrophenol	41	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	8.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dichlorophenol	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Acetylaminofluorene	0.68	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	8,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorophenol	40	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Picoline	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3-Methylcholanthrene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Aminobiphenyl	0.12	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthene	3,800	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthylene	6,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetophenone	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Aniline	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Anthracene	66	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aramite, Total	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)anthracene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)pyrene	0.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene	1.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(g,h,i)perylene	0.26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0.9J	< 10
Benzo(k)fluoranthene	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzyl alcohol	31,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Butylbenzylphthalate	2,700	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chrysene	1.9	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol (ortho)	5,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol, m & p	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diallate, Total	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0.82J	< 10
Dibenzofuran	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylphthalate	5,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethoate	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethylphthalate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-butylphthalate	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-octylphthalate	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Disulfoton	0.3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl methanesulfonate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl parathion (Parathion)	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Famphur	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoranthene	260	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluorene	1,900	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachloroethane	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter (Sample ID: / Sample Date:)	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-17D 1/30/2004	E-17D 3/1/2004	E-21 3/1/2004	E-23 1/27/2004	E-24 1/30/2004	E-27 2/4/2004	E-28D 2/5/2004	E-28D 3/1/2004	E-29 2/2/2004
Semivolatile Organic Compounds con'd. (ug/l)										
Hexachlorophene	--	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isophorone	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isosafrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
m-Dinitrobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methapyrilene	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl parathion	2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	100	< 10	< 10	< 10	< 10	< 10	1.6J	< 10	< 10	< 10
Nitrobenzene	51	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiethylamine	0.0043	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodimethylamine	0.013	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiphenylamine	530	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomorpholine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopiperidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
o-Toluidine	11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorobenzene	82	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachloronitrobenzene	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorophenol	1	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Phenacetin	1,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenanthrene	1,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenol	4,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phorate	4.1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pronamide	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyrene	130	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyridine	20	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Safrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dissolved Metals (ug/l)										
Antimony (Dissolved)	6	< 20	< 20	< 20	< 20	< 20	< 20	< 20L	< 20	< 20
Arsenic, (Dissolved)	50	< 10L	5.2L	5.6L	< 10	< 10L	< 10L	5.4K	< 10L	< 10L
Barium, (Dissolved)	2,000	34	40	420	69	38	44	390	400	48
Beryllium (Dissolved)	4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Cadmium (Dissolved)	5	< 5	< 5	< 5	1.8J	< 5	< 5	< 5	< 5	< 5
Chromium, (Dissolved)	100	< 10	< 10	1.9B	1.2B	< 10	1.4B	< 10	< 10	< 10
Cobalt (Dissolved)	2,000	5.8J	7J	2.4J	10	7.5J	75	< 10	< 10	< 10
Copper, Dissolved	1,000	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Lead, (Dissolved)	5	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L
Mercury (Dissolved)	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel, (Dissolved)	100	28J	24J	3.2J	48	46	92	< 40	2.7J	< 40
Selenium (Dissolved)	50	< 10	< 10L	< 10L	< 10	< 10	< 10	< 10	< 10L	< 10
Silver (Dissolved)	100	< 10	< 10	< 10	< 10L	< 10	< 10	< 10	< 10	< 10
Thallium (Dissolved)	2	< 10L	< 10	< 10	< 10L	< 10L	< 10L	< 10L	< 10	< 10L
Tin (Dissolved)	61,000	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Vanadium (Dissolved)	720	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Zinc, (Dissolved)	2,000	41	17J	3.3B	38	44	57	8.2B	8.3B	4.1B
Total Dissolved Solids (ug/l)	--	500	NA	9,100	420	720	730	750	NA	580

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-31 1/27/2004	E-33 1/27/2004	E-34 2/2/2004	E-35 1/28/2004	E-37 1/28/2004	E-40 2/2/2004	E-43 1/26/2004
Volatile Organic Compounds (ug/L)[a]								
1,1,1,2-Tetrachloroethane	70	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,1,1-Trichloroethane	200	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,1,2,2-Tetrachloroethane	0.3	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,1,2-Trichloroethane	5	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,1-Dichloroethane	110	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,1-Dichloroethene	7	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,2-Dibromo-3-chloropropane	0.2	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,2-Dibromoethane (EDB)	0.05	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,2-Dichloroethane	5	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,2-Dichloropropane	5	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,2,3-Trichloropropane	40	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
1,2,4-Trimethylbenzene	35	1,300/1,500	98	< 1	< 1	< 1	< 1	620
1,3,5-Trimethylbenzene	35	<2/25J	29	< 1	< 1	< 1	< 1	310
2-Butanone (Methyl ethyl ketone)	5,800	<20/<500	< 10	1.8J	< 10	< 10	< 10	< 20
2-Hexanone	--[c]	<20/<500	< 10	< 10	< 10	< 10	< 10	< 20
3-Chloropropene (Allylchloride)	41	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
4-Methyl-2-pentanone (MIBK)	410	<20/<500	< 10	1J	< 10	< 10	< 10	< 20
Acetone	10,000	<50/<1,200	7.2J	8.6J	< 25	< 25	< 25	12J
Acetonitrile	350	<80/<2,000	< 40	< 40	< 40	< 40	< 40	< 80
Acrolein (Propenal)	0.12	<40/<1,000	< 20	< 20	< 20	< 20	< 20	< 40
Acrylonitrile	2.7	<40/<1,000	< 20	< 20	< 20	< 20	< 20	< 40
Benzene	5	18/<50	< 1	< 1	< 1	< 1	< 1	< 2
Bromodichloromethane	100	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Bromoform	100	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Bromomethane (Methyl Bromide)	10	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Carbon disulfide	4,100	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Carbon tetrachloride	5	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Chlorobenzene	100	14/<50	< 1	< 1	< 1	< 1	< 1	< 2
Chloroethane	900	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Chloroform	100	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Chloromethane (Methyl Chloride)	3	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Chloroprene	41	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
cis-1,2-Dichloroethene	70	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
cis-1,3-Dichloropropene	26	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Dibromochloromethane	--	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Dibromomethane (Methylene bromide)	200	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Dichlorodifluoromethane	1,000	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Ethyl methacrylate	1,800	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Ethylbenzene	700	370/360	16	< 1	< 1	< 1	< 1	22
Iodomethane (Methyl iodide)	--	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Isobutanol (Isobutyl alcohol)	6,100	<80/<2,000	< 40	< 40	< 40	< 40	< 40	< 80
Methacrylonitrile	4.1	<40/<1,000	< 20	< 20	< 20	< 20	< 20	< 40
Methyl methacrylate	4,100	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Methylene chloride (Dichloromethane)	5	<10/<250	< 5	< 5	< 5	< 5	< 5	< 10
Pentachloroethane	--	<10/<250	< 5	< 5	< 5	< 5	< 5	< 10
Propionitrile	--	<40/<1,000	< 20	< 20	< 20	< 20	< 20	< 40
Styrene	100	<2/<50	< 1	< 1	< 1	< 1	< 1	6.9
Tetrachloroethene	5	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Toluene	1,000	27/28J	0.84J	< 1	< 1	< 1	< 1	< 2
trans-1,2-Dichloroethene	100	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
trans-1,3-Dichloropropene	26	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
trans-1,4-Dichloro-2-butene	0.069	<4/<100	< 2	< 2	< 2	< 2	< 2	< 4
Trichloroethene	5	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Trichlorofluoromethane	--	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Vinyl acetate	1,200	<4/<100	< 2	< 2	< 2	< 2	< 2	< 4
Vinyl chloride	2	<2/<50	< 1	< 1	< 1	< 1	< 1	< 2
Xylenes, Total	10,000	610/610	3.6	< 2	< 2	< 2	< 2	140

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-31 1/27/2004	E-33 1/27/2004	E-34 2/2/2004	E-35 1/28/2004	E-37 1/28/2004	E-40 2/2/2004	E-43 1/26/2004
Semivolatile Organic Compounds (ug/l)								
1,2,4-Trichlorobenzene	70	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	8.8J/11	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dioxane	24	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Naphthoquinone	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	<2,000/<2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-Trichlorophenol	10,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,6-Trichlorophenol	31	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dichlorophenol	20	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dimethylphenol	2,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dinitrophenol	41	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	8.4	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dichlorophenol	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	100	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2-Acetylaminofluorene	0.68	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	8,200	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorophenol	40	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	2,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2-Naphthylamine	1.4	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	<10/<10	< 10	< 10	< 10	< 10	< 10	3.8J
2-Picoline	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20
3-Methylcholanthrene	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
4-Aminobiphenyl	0.12	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20
5-Nitro-o-toluidine	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthene	3,800	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthylene	6,100	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Acetophenone	10,000	67/82	20	< 10	< 10	< 10	< 10	6,200
alpha,alpha-Dimethylphenethylamine	--	<2,000/<2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Aniline	5.8	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20
Anthracene	66	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Aramite, Total	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)anthracene	3.6	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)pyrene	0.2	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene	1.2	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(g,h,i)perylene	0.26	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(k)fluoranthene	0.55	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Benzyl alcohol	31,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Butylbenzylphthalate	2,700	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Chrysene	1.9	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol (ortho)	5,100	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol, m & p	510	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Diallate, Total	10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzofuran	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylphthalate	5,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethoate	20	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethylphthalate	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-butylphthalate	10,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-octylphthalate	2,000	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Disulfoton	0.3	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl methanesulfonate	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl parathion (Parathion)	610	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Famphur	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoranthene	260	<10/<10	< 10	< 10	1.1J	1.3J	< 10	< 10
Fluorene	1,900	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobenzene	1	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	1	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	50	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachloroethane	1	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-31 1/27/2004	E-33 1/27/2004	E-34 2/2/2004	E-35 1/28/2004	E-37 1/28/2004	E-40 2/2/2004	E-43 1/26/2004
Semivolatile Organic Compounds con'd. (ug/l)								
Hexachlorophene	--	<5,000/<5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Isophorone	100	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Isosafrole	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
m-Dinitrobenzene	1	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Methapyrilene	--	<2,000/<2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl parathion	2	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	100	180/220	3J	< 10	< 10	< 10	< 10	180
Nitrobenzene	51	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiethylamine	0.0043	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodimethylamine	0.013	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiphenylamine	530	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomorpholine	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopiperidine	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
o-Toluidine	11	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorobenzene	82	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachloronitrobenzene	10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorophenol	1	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
Phenacetin	1,200	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Phenanthrene	1,100	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Phenol	4,000	<10/<10	< 10	< 10	< 10	< 10	< 10	140
Phorate	4.1	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Pronamide	50	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Pyrene	130	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Pyridine	20	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
Safrole	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Dissolved Metals (ug/l)								
Antimony (Dissolved)	6	<20/<20	< 20	< 20	< 20	< 20	< 20	< 20
Arsenic, (Dissolved)	50	7.5J/<10	32	< 10L	< 10	< 10	6.8L	< 10
Barium, (Dissolved)	2,000	140/130	380	630	100	72	370	54
Beryllium (Dissolved)	4	<4/<4	< 4	< 4	< 4	< 4	< 4	< 4
Cadmium (Dissolved)	5	<5/<5	1.3J	3.3J	< 5	< 5	1.8J	< 5
Chromium, (Dissolved)	100	1.8B/1.5B	3.7B	< 10	< 10	1.6B	2B	1.1B
Cobalt (Dissolved)	2,000	<10/<10	< 10	28	4.6J	< 10	2.1J	1.4J
Copper, Dissolved	1,000	<20/<20	< 20	13J	< 20	< 20	< 20	< 20
Lead, (Dissolved)	5	<5L/<5L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L
Mercury (Dissolved)	2	<0.2/<0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.23	< 0.2
Nickel, (Dissolved)	100	<40/2.2B	2.8B	22J	3.2B	8.3B	< 40	9.5B
Selenium (Dissolved)	50	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Silver (Dissolved)	100	<10L/<10L	< 10L	< 10	< 10L	< 10L	< 10	< 10L
Thallium (Dissolved)	2	<10L/<10L	< 10L	< 10L	< 10L	< 10L	< 10L	< 10L
Tin (Dissolved)	61,000	<50/<50	< 50	< 50	< 50	< 50	< 50	< 50
Vanadium (Dissolved)	720	<10/<10	< 10	< 10	< 10	< 10	< 10	< 10
Zinc, (Dissolved)	2,000	2.6B/3.3B	98	140	3.2B	10J	7B	32
Total Dissolved Solids (ug/l)	--	880/840	7,400	6,500	580	520	470	360

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-45D 1/30/2004	E-45D 3/1/2004	E-46D 1/29/2004	E-46D 3/1/2004	E-47D 2/4/2004	E-47D 3/1/2004	E-48 2/2/2004	E-49 1/27/2004	E-51 1/30/2004
Volatile Organic Compounds (ug/L) [a]										
1,1,1,2-Tetrachloroethane	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	200	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	0.3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane	110	< 1	0.82J	< 1	2.5	< 1	< 1	< 1	< 1	1.3B
1,1-Dichloroethene	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromo-3-chloropropane	0.2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	0.05	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-Trichloropropane	40	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	35	< 1	0.27J	< 1	< 1	0.33J	< 1	0.34J	0.27B	0.34J
1,3,5-Trimethylbenzene	35	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2-Butanone (Methyl ethyl ketone)	5,800	< 10	2.7J	< 10	< 10	< 10	< 10	< 10	2.4J	< 10
2-Hexanone	--[c]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Chloropropene (Allylchloride)	41	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
4-Methyl-2-pentanone (MIBK)	410	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	1J
Acetone	10,000	< 25	< 25	< 25	< 25	< 25	< 25	< 25	10J	< 25
Acetonitrile	350	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Acrolein (Propenal)	0.12	< 20	< 20	< 20	< 20	< 20	< 20	< 20	12J	< 20
Acrylonitrile	2.7	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Benzene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane (Methyl Bromide)	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon disulfide	4,100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	900	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane (Methyl Chloride)	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroprene	41	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	70	< 1	0.55J	< 1	3	< 1	< 1	< 1	< 1	1
cis-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane (Methylene bromide)	200	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dichlorodifluoromethane	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl methacrylate	1,800	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	700	< 1	< 1	< 1	< 1	<	< 1	< 1	< 1	< 1
Iodomethane (Methyl iodide)	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Isobutanol (Isobutyl alcohol)	6,100	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Methacrylonitrile	4.1	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl methacrylate	4,100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methylene chloride (Dichloromethane)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Pentachloroethane	--	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Propionitrile	--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Styrene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	5	< 1	< 1	< 1	< 1	< 1	1.2	< 1	< 1	< 1
Toluene	1,000	< 1	0.89J	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,4-Dichloro-2-butene	0.069	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Trichloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl acetate	1,200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Vinyl chloride	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Xylenes, Total	10,000	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-45D 1/30/2004	E-45D 3/1/2004	E-46D 1/29/2004	E-46D 3/1/2004	E-47D 2/4/2004	E-47D 3/1/2004	E-48 2/2/2004	E-49 1/27/2004	E-51 1/30/2004
Semivolatile Organic Compounds (ug/l)										
1,2,4-Trichlorobenzene	70	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dioxane	24	< 10	< 10	< 10	< 10	< 10	< 10	< 10	22	< 10
1,4-Naphthoquinone	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-Trichlorophenol	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,6-Trichlorophenol	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dichlorophenol	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dimethylphenol	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dinitrophenol	41	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	8.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dichlorophenol	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Acetylaminofluorene	0.68	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	8,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorophenol	40	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Picoline	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3-Methylcholanthrene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Aminobiphenyl	0.12	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthene	3,800	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthylene	6,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetophenone	10,000	< 10	1.8J	< 10	< 10	< 10	< 10	< 10	< 10	< 10
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Aniline	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Anthracene	66	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0.58J	< 10
Aramite, Total	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)anthracene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)pyrene	0.2	0.7J	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene	1.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(g,h,i)perylene	0.26	0.99J	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(k)fluoranthene	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzyl alcohol	31,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	4J	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Butylbenzylphthalate	2,700	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chrysene	1.9	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0.83J	< 10
Cresol (ortho)	5,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol, m & p	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diallate, Total	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzofuran	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylphthalate	5,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	2.7J	< 10
Dimethoate	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethylphthalate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-butylphthalate	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-octylphthalate	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Disulfoton	0.3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl methanesulfonate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl parathion (Parathion)	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Famphur	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoranthene	260	0.97J	< 10	< 10	< 10	< 10	< 10	< 10	2.2J	< 10
Fluorene	1,900	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachloroethane	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-45D 1/30/2004	E-45D 3/1/2004	E-46D 1/29/2004	E-46D 3/1/2004	E-47D 2/4/2004	E-47D 3/1/2004	E-48 2/2/2004	E-49 1/27/2004	E-51 1/30/2004
Semivolatile Organic Compounds con'd. (ug/l)										
Hexachlorophene	--	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isophorone	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isosafrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
m-Dinitrobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methapyrilene	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl parathion	2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Nitrobenzene	51	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiethylamine	0.0043	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodimethylamine	0.013	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiphenylamine	530	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomorpholine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopiperidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
o-Toluidine	11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorobenzene	82	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachloronitrobenzene	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorophenol	1	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Phenacetin	1,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenanthrene	1,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	1.3J	< 10
Phenol	4,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phorate	4.1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pronamide	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyrene	130	1.1J	< 10	< 10	< 10	< 10	< 10	< 10	1.8J	< 10
Pyridine	20	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Safrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dissolved Metals (ug/l)										
Antimony (Dissolved)	6	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Arsenic, (Dissolved)	50	< 10L	< 10L	< 10L	< 10L	5.2L	< 10L	< 10L	< 10	< 10L
Barium, (Dissolved)	2,000	440	450	92	81	83	72	34	43	24
Beryllium (Dissolved)	4	< 4	< 4	< 4	< 4	< 4	0.45J	< 4	< 4	< 4
Cadmium (Dissolved)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium, (Dissolved)	100	< 10	< 10	2.8B	8J	< 10	< 10	< 10	< 10	< 10
Cobalt (Dissolved)	2,000	5J	3.6J	2.9J	1.7J	< 10	< 10	< 10	3.3J	3.5J
Copper, Dissolved	1,000	2.8J	3J	< 20	< 20	< 20	11J	< 20	< 20	< 20
Lead, (Dissolved)	5	3.2L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L	2.8L	< 5L
Mercury (Dissolved)	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel, (Dissolved)	100	14J	9.6B	140	110	87	2,000	15J	24J	61
Selenium (Dissolved)	50	< 10	< 10L	< 10	< 10L	< 10	< 10L	< 10	< 10	< 10
Silver (Dissolved)	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10L	< 10
Thallium (Dissolved)	2	< 10L	< 10	< 10L	< 10	< 10L	< 10	< 10L	< 10L	< 10L
Tin (Dissolved)	61,000	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Vanadium (Dissolved)	720	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Zinc, (Dissolved)	2,000	51	6.7B	11J	6.2B	12J	35	78	77	22
Total Dissolved Solids (ug/l)	--	620	NA	2,900	NA	540L	NA	1,700	720	11,000

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-52 1/26/2004	E-53 2/3/2004	E-54 1/30/2004	E-55 1/30/2004	E-56 2/3/2004	E-57 1/29/2004	E-58 1/26/2004	E-59 1/27/2004	E-59 3/1/2004
Volatile Organic Compounds (ug/L) [a]										
1,1,1,2-Tetrachloroethane	70	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	200	2.3	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	0.3	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,1-Dichloroethane	110	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,1-Dichloroethene	7	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,2-Dibromo-3-chloropropane	0.2	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	0.05	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,2-Dichloroethane	5	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,2,3-Trichloropropane	40	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	35	< 1	< 1	< 1	< 1	960	23	< 1	0.72B	< 1
1,3,5-Trimethylbenzene	35	< 1	< 1	< 1	< 1	< 5	11	< 1	0.32J	< 1
2-Butanone (Methyl ethyl ketone)	5,800	< 10	< 10	< 10	< 10	< 50	< 10	< 10	< 10	< 10
2-Hexanone	_[c]	< 10	< 10	< 10	< 10	< 50	< 10	< 10	< 10	< 10
3-Chloropropene (Allylchloride)	41	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
4-Methyl-2-pentanone (MIBK)	410	< 10	< 10	< 10	< 10	< 50	< 10	< 10	< 10	< 10
Acetone	10,000	< 25	< 25	< 25	< 25	< 120	< 25	< 25	< 25	< 25
Acetonitrile	350	< 40	< 40	< 40	< 40	< 200	< 40	< 40	< 40	< 40
Acrolein (Propenal)	0.12	< 20	< 20	< 20	< 20	< 100	< 20	< 20	< 20	< 20
Acrylonitrile	2.7	< 20	< 20	< 20	< 20	< 100	< 20	< 20	< 20	< 20
Benzene	5	< 1	< 1	< 1	< 1	11	< 1	< 1	< 1	< 1
Bromodichloromethane	100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Bromoform	100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Bromomethane (Methyl Bromide)	10	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Carbon disulfide	4,100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Carbon tetrachloride	5	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Chloroethane	900	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Chloroform	100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Chloromethane (Methyl Chloride)	3	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Chloroprene	41	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	70	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
cis-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Dibromochloromethane	--	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Dibromomethane (Methylene bromide)	200	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Dichlorodifluoromethane	1,000	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Ethyl methacrylate	1,800	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Ethylbenzene	700	< 1	< 1	< 1	< 1	430	1.3	< 1	< 1	< 1
Iodomethane (Methyl iodide)	--	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Isobutanol (Isobutyl alcohol)	6,100	< 40	< 40	< 40	< 40	< 200	< 40	< 40	< 40	< 40
Methacrylonitrile	4.1	< 20	< 20	< 20	< 20	< 100	< 20	< 20	< 20	< 20
Methyl methacrylate	4,100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Methylene chloride (Dichloromethane)	5	< 5	< 5	< 5	< 5	< 25	< 5	< 5	< 5	< 5
Pentachloroethane	--	< 5	< 5	< 5	< 5	< 25	< 5	< 5	< 5	< 5
Propionitrile	--	< 20	< 20	< 20	< 20	< 100	< 20	< 20	< 20	< 20
Styrene	100	< 1	< 1	< 1	< 1	< 5	3.6	< 1	< 1	< 1
Tetrachloroethene	5	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Toluene	1,000	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
trans-1,4-Dichloro-2-butene	0.069	< 2	< 2	< 2	< 2	< 10	< 2	< 2	< 2	< 2
Trichloroethene	5	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Trichlorofluoromethane	--	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Vinyl acetate	1,200	< 2	< 2	< 2	< 2	< 10	< 2	< 2	< 2	< 2
Vinyl chloride	2	< 1	< 1	< 1	< 1	< 5	< 1	< 1	< 1	< 1
Xylenes, Total	10,000	< 2	< 2	< 2	< 2	34	9.8	< 2	< 2	< 2

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[(b)] Used Aquifers, TDS≤2,500 Non-Residential	E-52 1/26/2004	E-53 2/3/2004	E-54 1/30/2004	E-55 1/30/2004	E-56 2/3/2004	E-57 1/29/2004	E-58 1/26/2004	E-59 1/27/2004	E-59 3/1/2004
Semivolatile Organic Compounds (ug/l)										
1,2,4-Trichlorobenzene	70	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	< 10	< 10	< 10	4.2J	< 10	< 10	< 10	< 10	< 10
1,4-Dioxane	24	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Naphthoquinone	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-Trichlorophenol	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,6-Trichlorophenol	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dichlorophenol	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dimethylphenol	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dinitrophenol	41	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	8.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dichlorophenol	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Acetylaminofluorene	0.68	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	8,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorophenol	40	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Picoline	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3-Methylcholanthrene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Aminobiphenyl	0.12	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthene	3,800	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthylene	6,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetophenone	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Aniline	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Anthracene	66	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aramite, Total	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)anthracene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)pyrene	0.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene	1.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(g,h,i)perylene	0.26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	0.96J
Benzo(k)fluoranthene	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzyl alcohol	31,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Butylbenzylphthalate	2,700	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chrysene	1.9	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol (ortho)	5,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol, m & p	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diallate, Total	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzofuran	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylphthalate	5,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethoate	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethylphthalate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-butylphthalate	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-octylphthalate	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Disulfoton	0.3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl methanesulfonate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl parathion (Parathion)	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Famphur	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoranthene	260	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluorene	1,900	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachloroethane	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	Sample ID: / Sample Date: PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-52 1/26/2004	E-53 2/3/2004	E-54 1/30/2004	E-55 1/30/2004	E-56 2/3/2004	E-57 1/29/2004	E-58 1/26/2004	E-59 1/27/2004	E-59 3/1/2004
Semivolatile Organic Compounds con'd. (ug/l)										
Hexachlorophene	--	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isophorone	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isosafrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
m-Dinitrobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methapyrilene	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl parathion	2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	100	< 10	< 10	< 10	< 10	18	< 10	< 10	< 10	< 10
Nitrobenzene	51	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiethylamine	0.0043	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodimethylamine	0.013	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiphenylamine	530	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomorpholine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopiperidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
o-Toluidine	11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorobenzene	82	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachloronitrobenzene	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorophenol	1	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Phenacetin	1,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenanthrene	1,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenol	4,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phorate	4.1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pronamide	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyrene	130	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyridine	20	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Safrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dissolved Metals (ug/l)										
Antimony (Dissolved)	6	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Arsenic, (Dissolved)	50	< 10	< 10L	< 10	47L	< 10L	< 10L	< 10	< 10	5.6L
Barium, (Dissolved)	2,000	41	39	37	270	350	110	66	190	200
Beryllium (Dissolved)	4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Cadmium (Dissolved)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium, (Dissolved)	100	< 10	< 10	< 10	< 10	1.6B	< 10	< 10	1.7B	< 10
Cobalt (Dissolved)	2,000	3.7J	< 10	< 10	< 10	< 10	< 10	< 10	17	1.7J
Copper, Dissolved	1,000	4J	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Lead, (Dissolved)	5	3.2L	< 5L	3.9L	< 5L	< 5L	< 5L	< 5L	< 5L	< 5L
Mercury (Dissolved)	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel, (Dissolved)	100	56	2.7J	5.9J	3.2J	< 40	3.9J	< 40	< 40	< 40
Selenium (Dissolved)	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10L
Silver (Dissolved)	100	< 10L	< 10	< 10	< 10	< 10	< 10	< 10L	< 10L	< 10
Thallium (Dissolved)	2	< 10L	< 10L	< 10L	< 10L	< 10L	< 10L	< 10L	< 10L	< 10
Tin (Dissolved)	61,000	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Vanadium (Dissolved)	720	< 10	< 10	< 10	< 10	< 10	< 10	0.87B	< 10	< 10
Zinc, (Dissolved)	2,000	25	6.3B	7.7B	2.8B	2.8B	6.8B	6.2B	3.1B	9.6B
Total Dissolved Solids (ug/l)	--	1,100	1,100	430	470	2,200	650	460	720	NA

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-60 1/27/2004	E-60 3/1/2004	E-61 1/28/2004	E-61 3/2/2004	E-62 1/29/2004	E-62 3/2/2004	E-63 1/26/2004	E-63 3/2/2004	MW-F1 2/4/2004
Volatile Organic Compounds (ug/L) [a]										
1,1,1,2-Tetrachloroethane	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-Trichloroethane	200	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	0.3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethane	110	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethene	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromo-3-chloropropane	0.2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	0.05	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-Trichloropropane	40	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	35	10	0.72J	0.8B	< 1	0.52J	0.23B	0.4B	0.21B	0.76J
1,3,5-Trimethylbenzene	35	6.8	0.59J	0.23J	< 1	0.38J	< 1	< 1	< 1	0.28J
2-Butanone (Methyl ethyl ketone)	5,800	11	< 10	< 10	< 10	2.6J	< 10	22	< 10	< 10
2-Hexanone	--[c]	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Chloropropene (Allylchloride)	41	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
4-Methyl-2-pentanone (MIBK)	410	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetone	10,000	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
Acetonitrile	350	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Acrolein (Propenal)	0.12	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Acrylonitrile	2.7	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Benzene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane (Methyl Bromide)	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon disulfide	4,100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	900	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	100	< 1	< 1	< 1	< 1	< 1	< 1	2.9	< 1	< 1
Chloromethane (Methyl Chloride)	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroprene	41	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
cis-1,2-Dichloroethene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
cis-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane (Methylene bromide)	200	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dichlorodifluoromethane	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl methacrylate	1,800	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	700	1.4	0.77J	< 1	< 1	< 1	< 1	0.35J	< 1	< 1
Iodomethane (Methyl iodide)	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Isobutanol (Isobutyl alcohol)	6,100	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Methacrylonitrile	4.1	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl methacrylate	4,100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methylene chloride (Dichloromethane)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Pentachloroethane	--	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Propionitrile	--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Styrene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	1,000	< 1	< 1	< 1	< 1	< 1	< 1	6	< 1	< 1
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	26	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,4-Dichloro-2-butene	0.069	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Trichloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl acetate	1,200	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Vinyl chloride	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Xylenes, Total	10,000	1.8J	< 2	1.4J	< 2	< 2	< 2	1.9J	< 2	< 2

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-60 1/27/2004	E-60 3/1/2004	E-61 1/28/2004	E-61 3/2/2004	E-62 1/29/2004	E-62 3/2/2004	E-63 1/26/2004	E-63 3/2/2004	MW-F1 2/4/2004
Semivolatile Organic Compounds (ug/l)										
1,2,4-Trichlorobenzene	70	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Dioxane	24	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Naphthoquinone	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-Trichlorophenol	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,6-Trichlorophenol	31	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dichlorophenol	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dimethylphenol	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4-Dinitrophenol	41	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	8.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dichlorophenol	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Acetylaminofluorene	0.68	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	8,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorophenol	40	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Naphthylamine	1.4	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Picoline	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
3-Methylcholanthrene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Aminobiphenyl	0.12	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthene	3,800	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acenaphthylene	6,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acetophenone	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Aniline	5.8	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Anthracene	66	< 10	< 10	< 10	< 10	0.55J	< 10	< 10	< 10	< 10
Aramite, Total	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(a)anthracene	3.6	< 10	< 10	< 10	< 10	0.81J	< 10	< 10	< 10	< 10
Benzo(a)pyrene	0.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene	1.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(g,h,i)perylene	0.26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzo(k)fluoranthene	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzyl alcohol	31,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Butylbenzylphthalate	2,700	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chrysene	1.9	< 10	< 10	< 10	< 10	0.78J	< 10	< 10	< 10	< 10
Cresol (ortho)	5,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cresol, m & p	510	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diallate, Total	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dibenzofuran	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Diethylphthalate	5,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethoate	20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dimethylphthalate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-butylphthalate	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Di-n-octylphthalate	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Disulfoton	0.3	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl methanesulfonate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Ethyl parathion (Parathion)	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Famphur	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoranthene	260	< 10	< 10	1.5J	< 10	0.65J	< 10	< 10	< 10	< 10
Fluorene	1,900	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hexachloroethane	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	E-60 1/27/2004	E-60 3/1/2004	E-61 1/28/2004	E-61 3/2/2004	E-62 1/29/2004	E-62 3/2/2004	E-63 1/26/2004	E-63 3/2/2004	MW-F1 2/4/2004
Semivolatile Organic Compounds con'd. (ug/l)										
Hexachlorophene	--	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isophorone	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Isosafrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
m-Dinitrobenzene	1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methapyrilene	--	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl parathion	2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Nitrobenzene	51	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiethylamine	0.0043	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodimethylamine	0.013	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosodiphenylamine	530	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosomorpholine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopiperidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
o-Toluidine	11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorobenzene	82	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachloronitrobenzene	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pentachlorophenol	1	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Phenacetin	1,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenanthrene	1,100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phenol	4,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Phorate	4.1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pronamide	50	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Pyrene	130	< 10	< 10	1.3J	< 10	< 10	< 10	< 10	< 10	< 10
Pyridine	20	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Safrole	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dissolved Metals (ug/l)										
Antimony (Dissolved)	6	< 20	< 20	< 20	3.9K	< 20	4.3K	< 20	< 20	< 20
Arsenic, (Dissolved)	50	< 10	< 10L	< 10	23L	35L	51L	< 10	25L	< 10L
Barium, (Dissolved)	2,000	370	480	410	840	590	690	830	620	81
Beryllium (Dissolved)	4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Cadmium (Dissolved)	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium, (Dissolved)	100	2B	< 10	< 10	< 10	< 10	< 10	2.8B	< 10	< 10
Cobalt (Dissolved)	2,000	11	3.4J	1.6J	< 10	< 10	< 10	< 10	< 10	< 10
Copper, Dissolved	1,000	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Lead, (Dissolved)	5	< 5L	< 5L	2.7L	< 5L	< 5L	2.8B	< 5L	3.3B	< 5L
Mercury (Dissolved)	2	< 0.2	< 0.2	< 0.2	< 0.2L	< 0.2	< 0.2L	< 0.2	< 0.2L	< 0.2
Nickel, (Dissolved)	100	3.3B	3J	< 40	< 40	< 40	< 40	3.1B	< 40	14J
Selenium (Dissolved)	50	< 10	< 10L	< 10	< 10L	< 10	< 10L	< 10	< 10L	< 10
Silver (Dissolved)	100	< 10L	< 10	< 10L	< 10	< 10	< 10	< 10L	< 10	< 10
Thallium (Dissolved)	2	< 10L	< 10	< 10L	< 10L	< 10L	< 10L	< 10L	< 10L	< 10L
Tin (Dissolved)	61,000	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Vanadium (Dissolved)	720	< 10	< 10	< 10	0.93B	< 10	< 10	1.5B	< 10	< 10
Zinc, (Dissolved)	2,000	3.4B	6.3B	11J	3.1B	12J	7.1B	3.4B	6.2B	9.8B
Total Dissolved Solids (ug/l)	--	630	NA	610	NA	290	NA	7,500	NA	680L

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	MW-F2 2/4/2004	MW-F3 1/30/2004	MW-5 2/4/2004	W-1A 3/1/2004	W-2A 2/3/2004	W-7 3/1/2004	W-15 1/29/2004
Volatile Organic Compounds (ug/L)[a]								
1,1,1,2-Tetrachloroethane	70	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,1,1-Trichloroethane	200	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,1,2,2-Tetrachloroethane	0.3	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,1,2-Trichloroethane	5	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,1-Dichloroethane	110	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,1-Dichloroethene	7	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,2-Dibromo-3-chloropropane	0.2	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,2-Dibromoethane (EDB)	0.05	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,2-Dichloroethane	5	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,2-Dichloropropane	5	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,2,3-Trichloropropane	40	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
1,2,4-Trimethylbenzene	35	84	< 1	0.87J/1.2	< 1	18/14	870	2,000
1,3,5-Trimethylbenzene	35	< 1	< 1	0.32J/0.35J	< 1	<1/<1	370	900
2-Butanone (Methyl ethyl ketone)	5,800	< 10	< 10	<10/<10	< 10	<10/<10	< 50	< 1,000
2-Hexanone	--[c]	< 10	< 10	<10/<10	< 10	<10/<10	< 50	< 1,000
3-Chloropropene (Allylchloride)	41	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
4-Methyl-2-pentanone (MIBK)	410	< 10	< 10	<10/<10	< 10	<10/<10	< 50	< 1,000
Acetone	10,000	< 25	< 25	6.1J/5.3J	< 25	<25/<25	< 120	< 2,500
Acetonitrile	350	< 40	< 40	<40/<40	< 40	<40/<40	< 200	< 4,000
Acrolein (Propenal)	0.12	< 20	< 20	<20/<20	< 20	<20/<20	< 100	< 2,000
Acrylonitrile	2.7	< 20	< 20	<20/<20	< 20	<20/<20	< 100	< 2,000
Benzene	5	14	< 1	1.6/2.1	< 1	<1/<1	74	470
Bromodichloromethane	100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Bromoform	100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Bromomethane (Methyl Bromide)	10	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Carbon disulfide	4,100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Carbon tetrachloride	5	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Chlorobenzene	100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Chloroethane	900	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Chloroform	100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Chloromethane (Methyl Chloride)	3	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Chloroprene	41	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
cis-1,2-Dichloroethene	70	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
cis-1,3-Dichloropropene	26	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Dibromochloromethane	--	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Dibromomethane (Methylene bromide)	200	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Dichlorodifluoromethane	1,000	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Ethyl methacrylate	1,800	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Ethylbenzene	700	56	< 1	2.5/3.2	< 1	2/1.2	370	2,200
Iodomethane (Methyl iodide)	--	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Isobutanol (Isobutyl alcohol)	6,100	< 40	< 40	<40/<40	< 40	<40/<40	< 200	< 4,000
Methacrylonitrile	4.1	< 20	< 20	<20/<20	< 20	<20/<20	< 100	< 2,000
Methyl methacrylate	4,100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Methylene chloride (Dichloromethane)	5	< 5	< 5	<5/<5	< 5	<5/<5	< 25	< 500
Pentachloroethane	--	< 5	< 5	<5/<5	< 5	<5/<5	< 25	< 500
Propionitrile	--	< 20	< 20	<20/<20	< 20	<20/<20	< 100	< 2,000
Styrene	100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Tetrachloroethene	5	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Toluene	1,000	6.7	< 1	<1/<1	< 1	<1/<1	12	< 100
trans-1,2-Dichloroethene	100	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
trans-1,3-Dichloropropene	26	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
trans-1,4-Dichloro-2-butene	0.069	< 2	< 2	<2/<2	< 2	<2/<2	< 10	< 200
Trichloroethene	5	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Trichlorofluoromethane	--	< 1	< 1	<1/<1	< 1	<1/<1	< 5	650
Vinyl acetate	1,200	< 2	< 2	<2/<2	< 2	<2/<2	< 10	< 200
Vinyl chloride	2	< 1	< 1	<1/<1	< 1	<1/<1	< 5	< 100
Xylenes, Total	10,000	100	< 2	<2/1.8J	< 2	<2/<2	630	4,000

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	PADEP Act 2 MSCs[b] Used Aquifers, TDS≤2,500 Non-Residential	MW-F2 2/4/2004	MW-F3 1/30/2004	MW-5 2/4/2004	W-1A 3/1/2004	W-2A 2/3/2004	W-7 3/1/2004	W-15 1/29/2004
Semivolatile Organic Compounds (ug/l)								
1,2,4-Trichlorobenzene	70	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,2,4,5-Tetrachlorobenzene	31	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	600	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	600	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	75	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,4-Dioxane	24	< 10	< 10	<10/<10	< 10	<10/<10	< 10	76
1,4-Naphthoquinone	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	<2,000/<2,000	< 2,000	<2,000/<2,000	< 2,000	< 2,000
1-Naphthylamine	1.4	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	300	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,3,4,6-Tetrachlorophenol	610	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,4,5-Trichlorophenol	10,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,4,6-Trichlorophenol	31	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,4-Dichlorophenol	20	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,4-Dimethylphenol	2,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,4-Dinitrophenol	41	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
2,4-Dinitrotoluene	8.4	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,6-Dichlorophenol	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2,6-Dinitrotoluene	100	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2-Acetylaminofluorene	0.68	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2-Chloronaphthalene	8,200	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2-Chlorophenol	40	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2-Methylnaphthalene	2,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	39
2-Naphthylamine	1.4	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	5.8	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	820	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
2-Picoline	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
3,3'-Dichlorobenzidine	5.8	< 20	< 20	<20/<20	< 20	<20/<20	< 20	< 20
3,3'-Dimethylbenzidine	0.28	< 20	< 20	<20/<20	< 20	<20/<20	< 20	< 20
3-Methylcholanthrene	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	5.8	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	--	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
4-Aminobiphenyl	0.12	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	<10/<10	< 10	<10/<10	3.5J	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	510	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	410	< 20	< 20	<20/<20	< 20	<20/<20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	5.8	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	60	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	<20/<20	< 20	<20/<20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Acenaphthene	3,800	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Acenaphthylene	6,100	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Acetophenone	10,000	< 10	< 10	<10/<10	2.4J	<10/<10	< 10	27
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	<2,000/<2,000	< 2,000	<2,000/<2,000	< 2,000.	< 2,000
Aniline	5.8	< 20	< 20	<20/<20	< 20	<20/<20	< 20	< 20
Anthracene	66	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Aramite, Total	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Benzo(a)anthracene	3.6	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Benzo(a)pyrene	0.2	< 10	< 10	<10/<10	< 10	<10/0.72J	< 10	0.98J
Benzo(b)fluoranthene	1.2	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Benzo(g,h,i)perylene	0.26	< 10	< 10	<10/<10	< 10	<10/2.5J	< 10	1.1J
Benzo(k)fluoranthene	0.55	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Benzyl alcohol	31,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
bis(2-Chloroethyl)ether	0.55	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	< 10	< 10	4J/3.1J	< 10	<10/<10	< 10	< 10
Butylbenzylphthalate	2,700	< 10	< 10	<10/<10	< 10	1.9J/9.6J	< 10	< 10
Chrysene	1.9	< 10	< 10	<10/<10	< 10	<10/1J	< 10	< 10
Cresol (ortho)	5,100	< 10	< 10	<10/<10	< 10	1.9J/<10	< 10	< 10
Cresol, m & p	510	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Diallate, Total	10	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Dibenzo(a,h)anthracene	0.36	< 10	< 10	<10/<10	< 10	<10/2.1J	< 10	0.99J
Dibenzofuran	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Diethylphthalate	5,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Dimethoate	20	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Dimethylphthalate	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Di-n-butylphthalate	10,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Di-n-octylphthalate	2,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	7	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Disulfoton	0.3	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Ethyl methanesulfonate	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Ethyl parathion (Parathion)	610	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Famphur	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Fluoranthene	260	< 10	< 10	<10/<10	< 10	<10/<10	0.91J	< 10
Fluorene	1,900	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Hexachlorobenzene	1	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Hexachlorobutadiene	1	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Hexachlorocyclopentadiene	50	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Hexachloroethane	1	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter — Sample ID: / Sample Date:	PADEP Act 2 MSCs(a) Used Aquifers, TDS≤2,500 Non-Residential	MW-F2 2/4/2004	MW-F3 1/30/2004	MW-5 2/4/2004	W-1A 3/1/2004	W-2A 2/3/2004	W-7 3/1/2004	W-15 1/29/2004
Semivolatile Organic Compounds con'd. (ug/l)								
Hexachlorophene	--	< 5,000	< 5,000	<5,000/<5,000	< 5,000	<5000/63J	< 5,000	< 5,000
Hexachloropropene	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Indeno(1,2,3-cd)pyrene	3.6	< 10	< 10	<10/<10	< 10	<10/2J	< 10	1.1J
Isophorone	100	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Isosafrole	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
m-Dinitrobenzene	1	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Methapyrilene	--	< 2,000	< 2,000	<2,000/<2,000	< 2,000	<2,000/<2,000	< 2,000	< 2,000
Methyl methanesulfonate	26	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Methyl parathion	2	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Naphthalene	100	17	< 10	<10/<10	< 10	10/<10	< 10	840
Nitrobenzene	51	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosodiethylamine	0.0043	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosodimethylamine	0.013	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosodi-n-butylamine	0.11	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
n-Nitrosodi-n-propylamine	0.37	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosodiphenylamine	530	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosomorpholine	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosopiperidine	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
o-Toluidine	11	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
p-(Dimethylamino)azobenzene	0.57	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Pentachlorobenzene	82	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Pentachloronitrobenzene	10	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Pentachlorophenol	1	< 50	< 50	<50/<50	< 50	<50/5.6J	< 50	< 50
Phenacetin	1,200	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Phenanthrene	1,100	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Phenol	4,000	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Phorate	4.1	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Pronamide	50	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Pyrene	130	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Pyridine	20	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
Safrole	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	10	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Dissolved Metals (ug/l)								
Antimony (Dissolved)	6	< 20	< 20	<20/<20	< 20	<20/<20	< 20	< 20
Arsenic, (Dissolved)	50	< 10L	< 10L	<10L/<10L	< 10L	<10L/<10L	14L	< 10L
Barium, (Dissolved)	2,000	150	470	170/160	10	100/100	310	120
Beryllium (Dissolved)	4	< 4	0.53J	<4/<4	< 4	<4/<4	< 4	< 4
Cadmium (Dissolved)	5	< 5	7.9	<5/<5	9.5	<5/<5	< 5	< 5
Chromium, (Dissolved)	100	< 10	< 10	<10/<10	< 10	<10/<10	1.3B	4.8B
Cobalt (Dissolved)	2,000	< 10	63	<10/<10	< 10	<10/<10	< 10	19
Copper, Dissolved	1,000	< 20	2.9J	<20/<20	5.9J	<20/<20	< 20	< 20
Lead, (Dissolved)	5	3L	3.6L	<5L/<5L	2.5B	<5L/<5L	< 5L	3.2L
Mercury (Dissolved)	2	< 0.2	< 0.2	<0.2/<0.2	< 0.2	<0.2/<0.2	< 0.2	< 0.2
Nickel, (Dissolved)	100	< 40	130	<40/<40	3.8J	<40/<40	< 40	2.5J
Selenium (Dissolved)	50	< 10	< 10	<10/<10	< 10L	<10/<10	< 10L	< 10
Silver (Dissolved)	100	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Thallium (Dissolved)	2	< 10L	6.1L	<10L/<10L	< 10	<10L/<10L	< 10	< 10L
Tin (Dissolved)	61,000	< 50	< 50	<50/<50	< 50	<50/<50	< 50	< 50
Vanadium (Dissolved)	720	< 10	< 10	<10/<10	< 10	<10/<10	< 10	< 10
Zinc, (Dissolved)	2,000	2.3B	130	78/76	26	5.2B/2.8B	3.3B	6.2B
Total Dissolved Solids (ug/l)	--	1300L	1,100	1,400L/<5L	390	400/680	970	2,500

CUMMINGS RITER

TABLE 11
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) "ug/l" is micrograms per kilogram or parts per billion.
(b) PADEP statewide health medium specific concentrations (MSCs) for regulated substances in groundwater (Title 25, PA Code Chapter 250).
(c) "--" indicates no MSC has been promulgated under Act2.
(d) "<x" indicates result is below method detection limit, x.
(e) "x/x" indicates a duplicate sample was collected at this location.
(f) "J" indicates value is estimated.
(g) "B" indicates value is not detected substantially above the level reported in the laboratory or field blanks.
(h) Values shaded and in bold indicate an exceedance of the corresponding MSC.
(i) "L" indicates reported value may be biased low. Actual value is expected to be higher.
(j) "K" indicates reported value may be biased high. Actual value is expected to be lower.

TABLE 12
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Statewide Surface Water Title 25, Chapter 16[b]	SW-1 12/8/2003	SW-2 12/8/2003	SW-3 12/8/2003	SW-4 12/8/2003	SW-5 12/8/2003	EQB-1 12/8/2003
Volatile Organic Compounds (ug/l) [a]							
1,1,1,2-Tetrachloroethane	0.17	< 1[d]	< 1	< 1	< 200	<200/<200[e]	< 1
1,1,1-Trichloroethane	610	< 1	< 1	< 1	< 200	<200/<200	< 1
1,1,2,2-Tetrachloroethane	0.17	< 1	< 1	< 1	< 200	<200/<200	< 1
1,1,2-Trichloroethane	0.6	< 1	< 1	< 1	< 200	<200/<200	< 1
1,1-Dichloroethane	--[c]	< 1	< 1	< 1	< 200	<200/<200	< 1
1,1-Dichloroethene	0.057	< 1	< 1	< 1	< 200	<200/<200	< 1
1,2,3-Trichloropropane	210	< 1	< 1	< 1	< 200	<200/<200	< 1
1,2,4-Trimethylbenzene	--	< 1	< 1	63	180J [f]	92J/86J	< 1
1,2-Dibromo-3-chloropropane	--	< 1	< 1	< 1	< 200	<200/<200	< 1
1,2-Dibromoethane (EDB)	--	< 1	< 1	< 1	< 200	<200/<200	< 1
1,2-Dichloroethane	0.38	< 1	< 1	< 1	< 200	<200/<200	< 1
1,2-Dichloropropane	2200	< 1	< 1	< 1	< 200	<200/<200	< 1
1,3,5-Trimethylbenzene	–	< 1	< 1	19	140J	62J/64J	< 1
2-Butanone (Methyl ethyl ketone)	21000	< 10	< 10	< 10	< 2,000	<2,000/<2,000	< 10
2-Hexanone	4,300	< 10	< 10	< 10	< 2,000	<2,000/<2,000	< 10
3-Chloropropene (Allylchloride)	–	< 1	< 1	< 1	< 200	<200/<200	< 1
4-Methyl-2-pentanone (MIBK)	5,000	< 10	< 10	< 10	< 2,000	<2,000/<2,000	< 10
Acetone	3,500	< 25	< 25	< 25	< 5,000	<5,000/<5,000	< 25
Acetonitrile	--	< 40	< 40	< 40	< 8,000	<8,000/<8,000	< 40
Acrolein (Propenal)	1	< 20	< 20	< 20	< 4,000	<4,000/<4,000	< 20
Acrylonitrile	0.059	< 20	< 20	< 20	< 4,000	<4,000/<4,000	< 20
Benzene	1.2	< 1	< 1	1.7 [g]	< 200	<200/<200	< 1
Bromodichloromethane	--	< 1	< 1	< 1	< 200	<200/<200	< 1
Bromoform	4.3	< 1	< 1	< 1	< 200	<200/<200	< 1
Bromomethane (Methyl Bromide)	48	< 1	< 1	< 1	< 200	<200/<200	< 1
Carbon disulfide	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Carbon tetrachloride	0.25	< 1	< 1	< 1	< 200	<200/<200	< 1
Chlorobenzene	240	< 1	< 1	< 1	< 200	<200/<200	< 1
Chloroethane	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Chloroform	5.7	< 1	< 1	< 1	< 200	<200/<200	< 1
Chloromethane (Methyl Chloride)	5,500	< 1	< 1	< 1	< 200	<200/<200	< 1
Chloroprene	--	< 1	< 1	< 1	< 200	<200/<200	< 1
cis-1,2-Dichloroethene	--	< 1	< 1	< 1	< 200	<200/<200	< 1
cis-1,3-Dichloropropene	10[h]	< 1	< 1	< 1	< 200	<200/<200	< 1
Dibromochloromethane	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Dibromomethane (Methylene bromide)	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Dichlorodifluoromethane	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Ethyl methacrylate	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Ethylbenzene	580	< 1	< 1	28	110J	<200/<200	< 1
Iodomethane (Methyl iodide)	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Isobutanol (Isobutyl alcohol)	–	< 40	< 40	< 40	< 8,000	<8,000/<8,000	< 40
Methacrylonitrile	–	< 20	< 20	< 20	< 4,000	<4,000/<4,000	< 20
Methyl methacrylate	–	< 1	< 1	< 1	< 200	<200/<200	< 1
Methylene chloride (Dichloromethane)	5,500	< 5	< 5	< 5	< 1,000	<1,000/<1,000	< 5
Pentachloroethane	--	< 5	< 5	< 5	< 1,000	<1,000/<1,000	< 5
Propionitrile	--	< 20	< 20	< 20	< 4,000	<4,000/<4,000	< 20
Styrene	--	< 1	< 1	< 1	< 200	<200/<200	< 1
Tetrachloroethene	0.8	< 1	< 1	< 1	< 200	<200/<200	< 1
Toluene	330	< 1	< 1	0.82J	**19,000**	**8,500/8,100**	< 1
trans-1,2-Dichloroethene	700	< 1	< 1	< 1	< 200	<200/<200	< 1
trans-1,3-Dichloropropene	10[h]	< 1	< 1	< 1	< 200	<200/<200	< 1
trans-1,4-Dichloro-2-butene	--	< 2	< 2	< 2	< 400	<400/<400	< 2
Trichloroethene	2.7	< 1	< 1	< 1	< 200	<200/<200	< 1
Trichlorofluoromethane	--	< 1	< 1	< 1	< 200	<200/<200	< 1
Vinyl acetate	--	< 2	< 2	< 2	< 400	<400/<400	< 2
Vinyl chloride	2	< 1	< 1	< 1	< 200	<200/<200	< 1
Xylenes, Total	210	< 2	< 2	35	200J	<400/<400	< 2

TABLE 12
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Statewide Surface Water Title 25, Chapter 16[b]	SW-1 12/8/2003	SW-2 12/8/2003	SW-3 12/8/2003	SW-4 12/8/2003	SW-5 12/8/2003	EQB-1 12/8/2003
Semivolatile Organic Compounds (ug/l)							
1,2,4,5-Tetrachlorobenzene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
1,2,4-Trichlorobenzene	26	< 10	< 10	< 10	< 10	<10/<10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	160	< 10	< 10	< 10	< 10	<10/<10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	69	< 10	< 10	< 10	< 10	<10/<10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	150	< 10	< 10	< 10	< 10	<10/<10	< 10
1,4-Dioxane	--	< 10	< 10	< 10	< 10	<10/<10	< 10
1,4-Naphthoquinone	--	< 10	< 10	< 10	< 10	<10/<10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	< 2,000	< 2,000	<2,000/<2,000	< 2,000
1-Naphthylamine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	1,400	< 10	< 10	< 10	< 10	<10/<10	< 10
2,3,4,6-Tetrachlorophenol	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2,4,5-Trichlorophenol	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2,4,6-Trichlorophenol	2.1	< 10	< 10	< 10	< 10	<10/<10	< 10
2,4-Dichlorophenol	93	< 10	< 10	< 10	< 10	<10/<10	< 10
2,4-Dimethylphenol	130	< 10	< 10	< 10	< 10	<10/<10	< 10
2,4-Dinitrophenol	70	< 50	< 50	< 50	< 50	<50/<50	< 50
2,4-Dinitrotoluene	0.05	< 10	< 10	< 10	< 10	<10/<10	< 10
2,6-Dichlorophenol	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2,6-Dinitrotoluene	0.05	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Acetylaminofluorene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Chloronaphthalene	1,700	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Chlorophenol	110	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Methylnaphthalene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Naphthylamine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Nitroaniline (o-Nitroaniline)	--	< 50	< 50	< 50	< 50	<50/<50	< 50
2-Nitrophenol (o-Nitrophenol)	1,600	< 10	< 10	< 10	< 10	<10/<10	< 10
2-Picoline	--	< 10	< 10	< 10	< 10	<10/<10	< 10
3,3'-Dichlorobenzidine	0.04	< 20	< 20	< 20	< 20	<20/<20	< 20
3,3'-Dimethylbenzidine	--	< 20	< 20	< 20	< 20	<20/<20	< 20
3-Methylcholanthrene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
3-Nitroaniline (m-Nitroaniline)	--	< 50	< 50	< 50	< 50	<50/<50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	13.4	< 50	< 50	< 50	< 50	<50/<50	< 50
4-Aminobiphenyl	--	< 10	< 10	< 10	< 10	<10/<10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	< 10	< 10	<10/<10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	30	< 10	< 10	< 10	< 10	<10/<10	< 10
4-Chloroaniline (p-Chloroaniline)	--	< 20	< 20	< 20	< 20	<20/<20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	< 10	< 10	<10/<10	< 10
4-Nitroaniline (p-Nitroaniline)	--	< 50	< 50	< 50	< 50	<50/<50	< 50
4-Nitrophenol (p-Nitrophenol)	470	< 50	< 50	< 50	< 50	<50/<50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	< 20	< 20	<20/<20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Acenaphthene	17	< 10	< 10	< 10	< 10	<10/<10	< 10
Acenaphthylene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Acetophenone	--	< 10	< 10	< 10	< 10	<10/<10	< 10
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	< 2,000	< 2,000	<2,000/<2,000	< 2,000
Aniline	--	< 20	< 20	< 20	< 20	<20/<20	< 20
Anthracene	9600	< 10	< 10	< 10	< 10	<10/<10	< 10
Aramite, Total	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Benzo(a)anthracene	0.0044	< 10	< 10	< 10	< 10	<10/<10	< 10
Benzo(a)pyrene	0.0044	< 10	< 10	< 10	< 10	<10/<10	< 10
Benzo(b)fluoranthene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Benzo(g,h,i)perylene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Benzo(k)fluoranthene	0.0044	< 10	< 10	< 10	< 10	<10/<10	< 10
Benzyl alcohol	--	< 10	< 10	< 10	< 10	<10/<10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	< 10	< 10	<10/<10	< 10
bis(2-Chloroethyl)ether	0.031	< 10	< 10	< 10	< 10	<10/<10	< 10
bis(2-Ethylhexyl)phthalate	1.8	< 10	< 10	< 10	< 10	<10/<10	< 10
Butylbenzylphthalate	35	< 10	< 10	< 10	< 10	<10/<10	< 10

TABLE 12
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	PADEP Statewide Surface Water Title 25, Chapter 16[b]	SW-1 12/8/2003	SW-2 12/8/2003	SW-3 12/8/2003	SW-4 12/8/2003	SW-5 12/8/2003	EQB-1 12/8/2003
Semivolatile Organic Compounds cont'd. (ug/l) [a]							
Chrysene	0.0044	< 10	< 10	< 10	< 10	<10/<10	< 10
Cresol (ortho)	--	< 10	< 10	< 10	140	120/110	< 10
Cresol, m & p	160[i]	< 10	< 10	< 10	37	25/24	< 10
Diallate, Total	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Dibenzo(a,h)anthracene	0.0044	< 10	< 10	< 10	< 10	<10/<10	< 10
Dibenzofuran	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Diethylphthalate	800	< 10	< 10	< 10	< 10	<10/<10	< 10
Dimethoate	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Dimethylphthalate	500	< 10	< 10	< 10	< 10	<10/<10	< 10
Di-n-butylphthalate	21	< 10	< 10	< 10	< 10	<10/<10	< 10
Di-n-octylphthalate	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Disulfoton	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Ethyl methanesulfonate	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Ethyl parathion (Parathion)	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Famphur	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Fluoranthene	40	< 10	< 10	< 10	< 10	<10/<10	< 10
Fluorene	1,300	< 10	< 10	< 10	< 10	<10/<10	< 10
Hexachlorobenzene	0.00075	< 10	< 10	< 10	< 10	<10/<10	< 10
Hexachlorobutadiene	0.44	< 10	< 10	< 10	< 10	<10/<10	< 10
Hexachlorocyclopentadiene	1	< 10	< 10	< 10	< 10	<10/<10	< 10
Hexachloroethane	1.9	< 10	< 10	< 10	< 10	<10/<10	< 10
Hexachlorophene	--	< 5,000	< 5,000	< 5,000	< 5,000	<5,000/<5,000	< 5,000
Hexachloropropene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Indeno(1,2,3-cd)pyrene	0.0044	< 10	< 10	< 10	< 10	<10/<10	< 10
Isophorone	36	< 10	< 10	< 10	< 10	<10/<10	< 10
Isosafrole	--	< 10	< 10	< 10	< 10	<10/<10	< 10
m-Dinitrobenzene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Methapyrilene	--	< 2,000	< 2,000	< 2,000	< 2,000	<2,000/<2,000	< 2,000
Methyl methanesulfonate	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Methyl parathion	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Naphthalene	43	< 10	< 10	< 10	26	17/17	< 10
Nitrobenzene	17	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosodiethylamine	0.00069	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosodimethylamine	0.00069	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosodi-n-butylamine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
n-Nitrosodi-n-propylamine	0.005	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosodiphenylamine	5	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosomorpholine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosopiperidine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	< 10	< 10	<10/<10	< 10
o-Toluidine	--	< 10	< 10	< 10	< 10	<10/<10	< 10
p-(Dimethylamino)azobenzene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Pentachlorobenzene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Pentachloronitrobenzene	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Pentachlorophenol	0.28	< 50	< 50	< 50	< 50	<50/<50	< 50
Phenacetin	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Phenanthrene	1	< 10	< 10	< 10	< 10	<10/<10	< 10
Phenol	21,000	< 10	< 10	< 10	< 10	<10/<10	< 10
Phorate	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Pronamide	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Pyrene	960	< 10	< 10	< 10	< 10	<10/<10	< 10
Pyridine	--	< 50	< 50	< 50	< 50	<50/<50	< 50
Safrole	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	--	< 10	< 10	< 10	< 10	<10/<10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	< 10	< 10	<10/<10	< 10

CUMMINGS RITER

TABLE 12
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	Sample ID: / Sample Date: PADEP Statewide Surface Water Title 25, Chapter 16[b]	SW-1 12/8/2003	SW-2 12/8/2003	SW-3 12/8/2003	SW-4 12/8/2003	SW-5 12/8/2003	EQB-1 12/8/2003
Inorganics (ug/l)							
Antimony	14	< 20	< 20	< 20	< 20	<20/<20	< 20
Arsenic	50	< 10L[j]	< 10L	< 10L	< 10L	<10L/<10L	< 10L
Barium	2,400	47	57	62	76	66/66	2.1J
Beryllium	--	< 4	< 4	< 4	< 4	<4/<4	< 4
Cadmium	2.2	< 5	< 5	< 5	< 5	<5/<5	< 5
Chromium	74	1.4B[k]	1.1B	1.2B	2B	2.1B/1.6B	< 10
Cobalt	19	< 10	< 10	< 10	< 10	<10/<10	< 10
Copper	9	< 20	< 20	< 20	3.3J	<20/<20	< 20
Lead	2.5	< 5L	< 5L	< 5L	< 5L	<5L/<5L	< 5
Mercury	0.05	< 0.2	< 0.2	< 0.2	< 0.2	<0.2/<0.2	< 0.2
Nickel	52	11J	7.9J	3.4J	3.7J	2.8J/3.1J	< 40
Selenium	4.6	< 10R[l]	< 10R	< 10R	< 10R	<10R/<10R	< 10
Silver	750	< 10	< 10	< 10	< 10	<10/<10	< 10
Thallium	1.7	< 10L	< 10L	< 10L	< 10L	<10L/<10L	< 10
Tin	--	< 50	< 50	< 50	< 50	<50/<50	< 50
Vanadium	100	0.92B	< 10	1.7B	2.3B	1.6B/1.5B	< 10
Zinc	120	14B	10B	16B	42	25/26	9.1J

TABLE 12
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)'
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) "ug/l" is micrograms per liter.
(b) Surface water samples were compared to the most stringent Surface Water Criteria (as defined by Title 25, Chapter 16, Appendix A, Table 1, November 18, 2000).
(c) "--" denotes a standard for this compound does not exist.
(d) "<x" indicates value less than method detection limit (MDL).
(e) "x/x" indicates a duplicate sample was collected at this location.
(f) "J" indicates an estimated value that is less than the reporting limit, but greater than instrument detection limit.
(g) **Bold value** exceeds the corresponding PADEP statewide Surface Water Criteria.
(h) Reported value is for total 1, 3-Dichloropropene
(i) Reported value is for p-Cresol.
(j) "L" indicates that the reported value may be biased low. Actual value is expected to be higher.
(k) "B" indicates not detected substantially above the level reported in the laboratory or field blanks.
(l) "R" indicates analyte may or may not be present in the sample.

TABLE 13
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	SD-1 12/8/2003	SD-2 12/8/2003	SD-3 12/8/2003	SD-4 12/8/2003	SD-5 12/8/2003
Volatile Organic Compounds (ug/kg) [a]					
1,1,1,2-Tetrachloroethane	< 4.7[b]	< 9.2	< 240	<10,000/<11,000[c]	< 140
1,1,1-Trichloroethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,1,2,2-Tetrachloroethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,1,2-Trichloroethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,1-Dichloroethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,1-Dichloroethene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,2,3-Trichloropropane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,2,4-Trimethylbenzene	1.1J[d]	< 9.2	9,000	10,000/18,000	400
1,2-Dibromo-3-chloropropane	< 9.4	< 18	< 470	<20,000/<22,000	< 270
1,2-Dibromoethane (EDB)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,2-Dichloroethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,2-Dichloropropane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
1,3,5-Trimethylbenzene	< 4.7	< 9.2	4,000	<10,000/<11,000	190
2-Butanone (Methyl ethyl ketone)	< 23	14J	< 1,200	<51,000/<56,000	< 680
2-Hexanone	< 23	< 46	< 1,200	<51,000/<56,000	< 680
3-Chloropropene (Allylchloride)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
4-Methyl-2-pentanone (MIBK)	< 23	< 46	< 1,200	<51,000/<56,000	< 680
Acetone	79	140	< 2,400	<100,000/<110,000	< 1,400
Acetonitrile	< 190	< 370	< 9,400	<410,000/<450,000	< 5,400
Acrolein (Propenal)	< 94	< 180	< 4,700	<200,000/<220,000	< 2,700
Acrylonitrile	< 94	< 180	< 4,700	<200,000/<220,000	< 2,700
Benzene	4.8	3.2J	42J	<10,000/<11,000	< 140
Bromodichloromethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Bromoform	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Bromomethane (Methyl Bromide)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Carbon disulfide	41	80	< 240	<10,000/<11,000	< 140
Carbon tetrachloride	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Chlorobenzene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Chloroethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Chloroform	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Chloromethane (Methyl Chloride)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Chloroprene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
cis-1,2-Dichloroethene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
cis-1,3-Dichloropropene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Dibromochloromethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Dibromomethane (Methylene bromide)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Dichlorodifluoromethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Ethyl methacrylate	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Ethylbenzene	1.5J	< 9.2	980	1,900J/2,400J	1,300
Iodomethane (Methyl iodide)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Isobutanol (Isobutyl alcohol)	< 190	< 370	< 9,400	<410,000/<450,000	< 5,400
Methacrylonitrile	< 94	< 180	< 4,700	<200,000/<220,000	< 2,700
Methyl methacrylate	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Methylene chloride (Dichloromethane)	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Pentachloroethane	< 23	< 46	< 1,200	<51,000/<56,000	< 680
Propionitrile	< 94	< 180	< 4,700	<200,000/<220,000	< 2,700
Styrene	< 4.7	< 9.2	150J	<10,000/<11,000	< 140
Tetrachloroethene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Toluene	4.7	< 9.2	100J	310,000/430,000	1,200
trans-1,2-Dichloroethene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
trans-1,3-Dichloropropene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
trans-1,4-Dichloro-2-butene	< 9.4	< 18	< 470	<20,000/<22,000	< 270
Trichloroethene	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Trichlorofluoromethane	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Vinyl acetate	< 9.4	< 18	< 470	<20,000/<22,000	< 270
Vinyl chloride	< 4.7	< 9.2	< 240	<10,000/<11,000	< 140
Xylenes, Total	< 9.4	< 18	2,900	<20,000/3,200J	140J

TABLE 13
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date: / Parameter	SD-1 12/8/2003	SD-2 12/8/2003	SD-3 12/8/2003	SD-4 12/8/2003	SD-5 12/8/2003
Semivolatile Organic Compounds (ug/kg)					
1,2,4,5-Tetrachlorobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,2,4-Trichlorobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,2-Dichlorobenzene (o-Dichlorobenzene)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,3,5-Trinitrobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,3-Dichlorobenzene (m-Dichlorobenzene)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,4-Dichlorobenzene (p-Dichlorobenzene)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,4-Dioxane	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,4-Naphthoquinone	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
1,4-Phenylenediamine (p-Phenylenediamine)	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
1-Naphthylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,3,4,6-Tetrachlorophenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,4,5-Trichlorophenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,4,6-Trichlorophenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,4-Dichlorophenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,4-Dimethylphenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,4-Dinitrophenol	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
2,4-Dinitrotoluene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,6-Dichlorophenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2,6-Dinitrotoluene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Acetylaminofluorene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Chloronaphthalene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Chlorophenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Methylnaphthalene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Naphthylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Nitroaniline (o-Nitroaniline)	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
2-Nitrophenol (o-Nitrophenol)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
2-Picoline	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
3,3'-Dichlorobenzidine	< 8,700	< 11,000	< 7,800	<9,000/<9,200	< 890
3,3'-Dimethylbenzidine	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
3-Methylcholanthrene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
3-Nitroaniline (m-Nitroaniline)	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
4-Aminobiphenyl	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
4-Bromophenylphenyl ether	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
4-Chloroaniline (p-Chloroaniline)	< 8,700	< 11,000	< 7,800	<9,000/<9,2000	< 890
4-Chlorophenylphenyl ether	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
4-Nitroaniline (p-Nitroaniline)	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
4-Nitrophenol (p-Nitrophenol)	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
4-Nitroquinoline-1-oxide	< 43,000	< 57,000	< 39,000	<45,000/<46,000	< 4,400
5-Nitro-o-toluidine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
7,12-Dimethylbenz(a)anthracene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Acenaphthene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Acenaphthylene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Acetophenone	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
alpha,alpha-Dimethylphenethylamine	< 880,000	< 1,200,000	< 790,000	<920,000/<930,000	< 90,000
Aniline	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Anthracene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Aramite, Total	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Benzo(a)anthracene	660J	620J	1,400J	560J/<4,600	< 440
Benzo(a)pyrene	610J	< 5,700	1,400J	560J/<4,600	57J
Benzo(b)fluoranthene	490J	650J	1,600J	<4,500/<4,600	56J
Benzo(g,h,i)perylene	410J	490J	1,000J	390J/380J	< 440
Benzo(k)fluoranthene	520J	< 5,700	960J	390J/<4,600	31J
Benzyl alcohol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
bis(2-Chloroethoxy)methane	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
bis(2-Chloroethyl)ether	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
bis(2-Ethylhexyl)phthalate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	410B
Butylbenzylphthalate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440

TABLE 13
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter	Sample ID: SD-1 Sample Date: 12/8/2003	SD-2 12/8/2003	SD-3 12/8/2003	SD-4 12/8/2003	SD-5 12/8/2003
Semivolatile Organic Compounds cont'd. (ug/kg)					
Chrysene	730J	610J	1500J	560J/<4,600	< 440
Cresol (ortho)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Cresol, m & p	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Diallate, Total	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Dibenzo(a,h)anthracene	< 4,300	< 5,700	400J	<4,500/<4,600	< 440
Dibenzofuran	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Diethylphthalate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Dimethoate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Dimethylphthalate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Di-n-butylphthalate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Di-n-octylphthalate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Disulfoton	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Ethyl methanesulfonate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Ethyl parathion (Parathion)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Famphur	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Fluoranthene	1,200J	1,000J	2,100J	960J/520J	< 440
Fluorene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Hexachlorobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Hexachlorobutadiene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Hexachlorocyclopentadiene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Hexachloroethane	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Hexachlorophene	< 2,200,000	< 2,900,000	< 2,000,000	<2,300,000/<2,400,000	< 200,000
Hexachloropropene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Indeno(1,2,3-cd)pyrene	430J	460J	970J	370J/330J	27
Isophorone	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Isosafrole	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
m-Dinitrobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Methapyrilene	< 880,000	< 1,200,000	< 790,000	<920,000/<930,000	< 90,000
Methyl methanesulfonate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Methyl parathion	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Naphthalene	< 4,300	< 5,700	< 3,900	710J/900J	< 440
Nitrobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosodiethylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosodimethylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosodi-n-butylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
n-Nitrosodi-n-propylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosodiphenylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosomethylethylamine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosomorpholine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosopiperidine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
N-Nitrosopyrrolidine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
O,O,O-Triethyl phosphorothioate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
o-Toluidine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
p-(Dimethylamino)azobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Pentachlorobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Pentachloronitrobenzene	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Pentachlorophenol	< 22,000	< 29,000	< 20,000	<23,000/<24,000	< 2,300
Phenacetin	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Phenanthrene	650J	< 5,700	480J	720J/<4,600	< 440
Phenol	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Phorate	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Pronamide	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Pyrene	1,100J	970J	2,200J	900J/500J	25J
Pyridine	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Safrole	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Sulfotepp (Tetraethyl dithiopyrophosphate)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	< 4,300	< 5,700	< 3,900	<4,500/<4,600	< 440

TABLE 13
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample ID: / Sample Date:	SD-1 12/8/2003	SD-2 12/8/2003	SD-3 12/8/2003	SD-4 12/8/2003	SD-5 12/8/2003
Inorganics (mg/kg) [e]					
Antimony	< 2.5	< 3.4R[f]	< 2.3	<2.4/<2.5	< 2.5
Arsenic	6.8L[g]	7.7L	10L	6.7L/4.6L	8.3L
Barium	270	180	460	210/140	130
Beryllium	2	1.8	2.1	1.1/1.5	1.1
Cadmium	0.2J	0.12J	< 0.57	<0.61/<0.63	< 0.61
Chromium	58K[h]	48K	60K	27K/8.9K	24K
Cobalt	14K	18K	12K	11K/6.1K	15K
Copper	23	51L	33	35/13	28N
Lead	31L	37L	29	41L/8.9L	24L
Mercury	0.035	0.11	0.077	0.13/0.13	0.051
Nickel	34	55	29	26/11	27
Selenium	< 1.2R	< 1.7R	< 2.3	<1.2R/<1.3R	< 1.2R
Silver	< 1.2	< 1.7	< 1.1	<1.2/<1.3	< 1.2
Thallium	< 1.2L	< 1.7L	< 2.3L	<1.2L/<1.3L	< 1.2L
Tin	2.6B[i]	4.8B	2.3B	4.7B/2.6B	2.6B
Vanadium	37	33	52	23/7.6	31
Zinc	140	210K	160	180/65	110

TABLE 13
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Notes:

(a) "ug/kg" is micrograms per kilogram or parts per billion.
(b) "<x" indicates value less than method detection limit (MDL).
(c) "x/x" indicates a duplicate sample was collected at this location.
(d) "J" indicates an estimated value that is less than the reporting limit, but greater than instrument detection limit.
(e) "mg/kg" is milligrams per kilogram or parts per million.
(f) "R" indicates analyte may or may not be present in the sample.
(g) "L" indicates that the reported value may be biased low. Actual value is expected to be higher.
(h) "K" indicates reported value may be biased high. Actual value is expected to be lower.
(i) "B" indicates not detected substantially above the level reported in the laboratory or field blanks.

TABLE 14
SUMMARY OF INDOOR AIR ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample ID: / Sample Date:	OSHA[b] PELs	W W Poly[c] 1/8/2004	MP Poly 1/8/2004	Pilot Plant 1/8/2004	C-5 Warehouse 1/8/2004	V-8 Control Building 1/9/2004	Field Blank[d] 1/8/2004
Parameter (mg/m^3)[a]							
Ethylbenzene	435	0.14	0.29	<0.074	<0.062/<0.064[g]	<0.072	0.069
Toluene	754	0.32	0.29	0.34	0.22/0.23	1.1	0.29
Naphthalene	50	<0.072[f]	<0.064	<0.074	<0.062/<0.064	<0.072	<0.084
Benzene	3.19	<0.072	<0.064	<0.074	<0.062/<0.064	<0.072	<0.064
Xylenes(total)[e]	435	0.47	1.4	0.18	<0.12/<0.13	<0.14	0.264
Styrene	426	0.43	0.97	0.17	<0.062/<0.064	<0.072	0.073
PID[h] Readings (ppm)[i]							
Inside Building	--	5[j]	10	0.3	0	0	--
Outside Building	--	0	1.6	0	0	0	--

Notes:

(a) "mg/m^3" is milligrams per cubic meter.
(b) Occupational Safety and Health Administration (OSHA) permissable exposure limits (PELs).
(c) Indoor air samples were collected over an eight-hour period using Summa canisters and flow controllers.
(d) Field Blank is an ambient air field blank sample that was collected outside of the MP Poly building.
(e) Xylenes(total) concentration was obtained by adding m&p-xylene and o-xylene concentrations.
(f) "<x" indicates value less than method detection limit (MDL).
(g) "--/--" indicates a duplicate sample was collected at this location.
(h) Photoionization Detector (PID) 10.2 electron volt lamp.
(i) "ppm" is parts per million.
(j) PID readings were measured prior to canister deployment, at sample collection time mid-point (4 hours), and just prior to end of the sampling interval. Value reported is the highest of the three PID readings measured at the respective location.

CUMMINGS RITER

TABLE 15
SUMMARY OF WATER LEVELS AND DRAWDOWN VALUES
UNDER CREEK INTERCEPTOR TRENCH
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

	2/26/2004										
Well/Piezometer	Time	Static Water Level (feet, TOR)[a]	Time	Water Level (feet, TOR)	Drawdown (feet)[b]	Time	Water Level (feet, TOR)	Drawdown (feet)	Time	Water Level (feet, TOR)	Drawdown (feet)
MH-A	824	6.48	1031	7.02	0.54	1157	7.33	0.85	1329	7.56	1.08
MH-B	810	9.95	1034	10.59	0.64	12.01	10.84	0.89	1332	11.12	1.17
MH-C	816	7.39	1051	8.02	0.63	1215	8.26	0.87	1350	8.53	1.14
MH-D	821	9.15	1045	9.78	0.63	1210	10.04	0.89	1344	10.31	1.16
Stream[c]	824	4.13	1030	4.13	0.00	1158	4.13	0.00	1328	4.13	0.00
E-8D	856	15.81	1042	15.87	0.06	1207	15.93	0.12	1341	15.93	0.12
E-9	858	12.73	1043	12.72	-0.01	1209	12.74	0.01	1342	12.74	0.01
E-13D	849	21.51	1043	21.51	0.00	1211	21.49	-0.02	1343	21.49	-0.02
E-14	852	18.78	1044	18.78	0.00	1212	18.80	0.02	1345	18.80	0.02
E-15	842	14.95	1041	14.95	0.00	1209	14.90	-0.05	1341	14.89	-0.06
E-16	833	5.56	1036	5.56	0.00	1203	5.57	0.01	1334	5.57	0.01
E-17D	835	19.81	1038	19.81	0.00	1205	19.88	0.07	1337	19.90	0.09
E-18	838	9.64	1040	9.64	0.00	1206	9.61	-0.03	1339	9.58	-0.06
E-26	848	12.46	1036	12.49	0.03	1202	12.50	0.04	1336	12.49	0.03
E-29	900	17.20	1051	17.21	0.01	1216	17.21	0.01	1351	17.20	0.00
E-32	905	4.65	1107	4.89	0.24	1232	4.89	0.24	1405	4.89	0.24
E-33	834	8.15	1101	8.17	0.02	1229	8.20	0.05	1402	8.25	0.10
E-35	853	11.00	1040	11.04	0.04	1205	11.04	0.04	1338	11.05	0.05
E-40	857	16.54	1047	16.54	0.00	1218	16.54	0.00	1347	16.54	0.00
E-43	907	19.24	1053	19.24	0.00	1224	19.24	0.00	1354	19.24	0.00
E-47D	859	20.17	1050	20.17	0.00	1221	20.26	0.09	1348	20.25	0.08
E-54	909	17.75	1056	17.75	0.00	1226	17.73	-0.02	1356	17.69	-0.06
E-60	837	13.32	1058	13.35	0.03	1227	13.42	0.10	1400	13.42	0.10
E-61	915	15.55	1058	15.55	0.00	1228	15.62	0.07	1400	15.62	0.07
W-10	902	3.63	1105	3.62	-0.01	1230	3.62	-0.01	1404	3.63	0.00
W-21A	916	14.59	1049	14.59	0.00	1213	14.63	0.04	1348	14.67	0.08
LP-2	844	9.55	1054	9.85	0.30	1218	9.92	0.37	1353	9.96	0.41
LP-5	840	12.99	1103	13.05	0.06	1225	13.08	0.09	1358	13.10	0.11

CUMMINGS RITER

TABLE 15
SUMMARY OF WATER LEVELS AND DRAWDOWN VALUES
UNDER CREEK INTERCEPTOR TRENCH
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

	2/26/2004			2/27/2004					
Well/Piezometer	Time	Water Level (feet, TOR)	Drawdown (feet)	Time	Water Level (feet, TOR)	Drawdown (feet)	Time	Water Level (feet, TOR)	Drawdown (feet)
MH-A	1456	7.77	1.29	819	7.10	0.62	1307	8.10	1.62
MH-B	1458	11.34	1.39	811	11.52	1.57	1308	11.52	1.57
MH-C	1515	8.76	1.37	802	8.90	1.51	1310	8.90	1.51
MH-D	1510	10.55	1.40	802	10.71	1.56	1311	10.71	1.56
Stream[(c)]	---	---	---	745	4.13	0.00	1305	4.13	0.00
E-8D	1506	15.99	0.18	804	15.81	0.00	1312	15.81	0.00
E-9	1508	12.78	0.05	803	12.73	0.00	1313	12.73	0.00
E-13D	1508	21.49	-0.02	838	21.53	0.02	1341	21.53	0.02
E-14	1510	18.78	0.00	839	19.80	1.02	1342	19.80	1.02
E-15	1507	14.89	-0.06	837	15.96	1.01	1340	15.96	1.01
E-16	1501	5.56	0.00	755	5.64	0.08	1335	5.64	0.08
E-17D	1503	19.89	0.08	832	19.91	0.10	1336	19.91	0.10
E-18	1505	9.54	-0.10	833	9.61	-0.03	1338	9.61	-0.03
E-26	1501	12.51	0.05	938	12.71	0.25	1355	12.71	0.25
E-29	1512	17.19	-0.01	841	17.27	0.07	1348	17.24	0.04
E-32	1528	4.89	0.24	824	4.85	0.20	1330	4.85	0.20
E-33	1524	8.28	0.13	820	8.41	0.26	1325	8.41	0.26
E-35	1505	11.09	0.09	806	11.00	0.00	1315	11.00	0.00
E-40	1516	16.50	-0.04	848	16.50	-0.04	1317	16.50	-0.04
E-43	1519	19.20	-0.04	921	19.28	0.04	1350	19.28	0.04
E-47D	1517	20.13	-0.04	849	20.19	0.02	1345	20.19	0.02
E-54	1522	17.73	-0.02	920	17.80	0.05	1352	17.79	0.04
E-60	1522	13.46	0.14	917	15.58	2.26	1322	15.58	2.26
E-61	1527	15.63	0.08	917	15.58	0.03	1353	15.57	0.02
W-10	1526	3.63	0.00	823	3.55	-0.08	1346	3.55	-0.08
W-21A	1513	14.76	0.17	758	14.99	0.40	1318	14.99	0.40
LP-2	1518	9.94	0.39	950	9.98	0.43	1320	9.98	0.43
LP-5	1520	13.11	0.12	826	13.20	0.21	1321	13.20	0.21

Notes:

(a) "feet , TOR" is water level measured in reference to the top of riser.

(b) Drawdown is calculated by subtracting the static water level from the assessment water level. Positive drawdown indicates the lowering of the water level.

(c) Stream level was monitored next to MH-A during the assessment.

TABLE 16
SUMMARY OF WATER LEVELS AND DRAWDOWN VALUES
LOWER PLANT INTERCEPTOR TRENCH
HERCULES INCORPORTATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

	2/18/04												2/19/04					
Well/ Piezometer	Time	Static Water Level (ft., TOR)[a]	Time	Water Level (feet, TOR)	Drawdown (feet)[b]	Time	Water Level (feet, TOR)	Drawdown (feet)	Time	Water Level (feet, TOR)	Drawdown (feet)	Time	Water Level (feet, TOR)	Drawdown (feet)	Time	Water Level (feet, TOR)	Drawdown (feet)
MH-1	839	10.96	1035	11.02	0.06	1416	11.01	0.05	1645	11.01	0.05	817	11.01	0.05	1045	11.01	0.05
MH-2	835	16.97	1030	16.96	-0.01	1411	16.97	0.00	1642	16.97	0.00	840	17.86	0.89	1042	17.86	0.89
MH-3	812	19.16	1024	19.93	0.77	1407	23.23	4.07	1640	23.19	4.03	815	24.02	4.86	1040	24.02	4.86
MH-4	817	19.74	1018	20.28	0.54	1403	20.30	0.56	1637	20.30	0.56	811	20.11	0.37	1037	20.10	0.36
MH-5	823	18.26	1015	18.27	0.01	1400	18.26	0.00	1634	18.26	0.00	810	18.27	0.01	1034	18.27	0.01
E-21	832	1.82	1017	1.80	-0.02	1401	1.81	-0.01	1605	1.81	-0.01	800	1.82	0.00	1005	1.82	0.00
E-32	852	4.49	1029	4.51	0.02	1413	4.46	-0.03	1616	4.47	-0.02	828	4.54	0.05	1016	4.54	0.05
E-28D	830	18.52	1015	18.56	0.04	1400	18.57	0.05	1603	18.57	0.05	804	18.15	-0.37	1003	18.15	-0.37
E-30	842	7.31	1040	7.01	-0.30	1420	6.93	-0.38	1630	NA	NA	845	7.05	-0.26	1030	7.05	-0.26
E-31	854	5.59	1030	5.59	0.00	1414	5.55	-0.04	1617	5.55	-0.04	829	5.62	0.03	1017	5.62	0.03
E-34	836	3.66	1020	3.60	-0.06	1405	3.70	0.04	1607	3.71	0.05	820	3.74	0.08	1007	3.74	0.08
E-59	857	7.21	1031	7.21	0.00	1415	7.21	0.00	1618	7.22	0.01	830	7.10	-0.11	1018	7.10	-0.11
W-1A	900	3.29	1041	3.37	0.08	1420	3.56	0.27	1622	3.60	0.31	839	0.74	-2.55	1022	0.74	-2.55
W-2A	815	15.52	1013	15.52	0.00	1357	15.56	0.04	1602	15.56	0.04	813	15.70	0.18	1002	15.70	0.18
W-7	851	12.39	1039	12.30	-0.09	1425	12.35	-0.04	1628	12.35	-0.04	832	12.04	-0.35	1028	12.04	-0.35
W-15	838	4.40	1027	4.40	0.00	1408	4.35	-0.05	1610	4.38	-0.02	824	4.53	0.13	1010	4.53	0.13
MW-F3	840	10.02	1022	9.94	-0.08	1407	9.95	-0.07	1609	9.95	-0.07	822	10.20	0.18	1009	10.20	0.18
LP-6	842	12.54	1025	12.53	-0.01	1409	12.55	0.01	1612	12.55	0.01	825	12.72	0.18	1012	12.72	0.18
LP-7	845	2.13	1032	2.15	0.02	1416	2.11	-0.02	1620	2.11	-0.02	834	2.25	0.12	1020	2.25	0.12
LP-8	857	5.01	1033	5.01	0.00	1418	5.02	0.01	1626	5.02	0.01	837	5.01	0.00	1026	5.01	0.00
LP-9	814	9.38	1010	9.39	0.01	1355	9.40	0.02	1600	9.40	0.02	817	9.45	0.07	1000	9.45	0.07
W-10	850	3.24	1027	3.25	0.01	1411	3.26	0.02	1614	3.26	0.02	826	3.14	-0.10	1014	3.14	-0.10
X-0[c]	805	12.31	1046	12.32	0.01	1422	12.32	0.01	1624	12.32	0.01	842	12.40	0.09	1024	12.40	0.09

Notes:

(a) "feet , TOR" is water level measured in reference to the top of riser.

(b) Drawdown is calculated by subtracting the static water level from the assessment water level. Positive drawdown indicates the lowering of the water level.

(c) X-0 is a staff gauge location was used to measure the water level in the Monongahela River during the assessment.

TABLE 17
SUMMARY OF CULVERT WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample Description : Sample Date/Time : Parameter	PADEP Statewide Surface Water Title 25, Chapter 16[b]	36" Pipe Influent 3/2/2004	On-Site Culvert 3/2/2004	36" Pipe Effluent 3/2/2004
Volatile Organic Compounds (ug/l) [a]				
1,1,1,2-Tetrachloroethane	0.17	< 1[c]	< 1	< 1
1,1,1-Trichloroethane	610	< 1	< 1	< 1
1,1,2,2-Tetrachloroethane	0.17	< 1	< 1	< 1
1,1,2-Trichloroethane	0.6	< 1	< 1	< 1
1,1-Dichloroethane	--[d]	< 1	< 1	< 1
1,1-Dichloroethene	0.057	< 1	< 1	< 1
1,2,3-Trichloropropane	210	< 1	< 1	< 1
1,2,4-Trimethylbenzene	--	< 1	38	4.5
1,2-Dibromo-3-chloropropane	--	< 1	< 1	< 1
1,2-Dibromoethane (EDB)	--	< 1	< 1	< 1
1,2-Dichloroethane	0.38	< 1	< 1	< 1
1,2-Dichloropropane	2200	< 1	< 1	< 1
1,3,5-Trimethylbenzene	--	< 1	21	1.6
2-Butanone (Methyl ethyl ketone)	21000	< 10	3.7J[e]	< 10
2-Hexanone	4,300	< 10	< 10	< 10
3-Chloropropene (Allylchloride)	--	< 1	< 1	< 1
4-Methyl-2-pentanone (MIBK)	5,000	< 10	< 10	< 10
Acetone	3,500	< 25	24J	< 25
Acetonitrile	--	< 40	< 40	< 40
Acrolein (Propenal)	1	< 20	< 20	< 20
Acrylonitrile	0.059	< 20	< 20	< 20
Benzene	1.2	< 1	< 1	< 1
Bromodichloromethane	--	< 1	< 1	< 1
Bromoform	4.3	< 1	< 1	< 1
Bromomethane (Methyl Bromide)	48	< 1	< 1	< 1
Carbon disulfide	--	< 1	< 1	< 1
Carbon tetrachloride	0.25	< 1	< 1	< 1
Chlorobenzene	240	< 1	< 1	< 1
Chloroethane	--	< 1	< 1	< 1
Chloroform	5.7	< 1	< 1	< 1
Chloromethane (Methyl Chloride)	5,500	< 1	< 1	< 1
Chloroprene	--	< 1	< 1	< 1
cis-1,2-Dichloroethene	--	< 1	< 1	< 1
cis-1,3-Dichloropropene	10[h]	< 1	< 1	< 1
Dibromochloromethane	--	< 1	< 1	< 1
Dibromomethane (Methylene bromide)	--	< 1	< 1	< 1
Dichlorodifluoromethane	--	< 1	< 1	< 1
Ethyl methacrylate	--	< 1	< 1	< 1
Ethylbenzene	580	< 1	120	5
Iodomethane (Methyl iodide)	--	< 1	< 1	< 1
Isobutanol (Isobutyl alcohol)	--	< 40	< 40	< 40
Methacrylonitrile	--	< 20	< 20	< 20
Methyl methacrylate	--	< 1	< 1	< 1
Methylene chloride (Dichloromethane)	5,500	< 5	< 5	< 5
Pentachloroethane	--	< 5	< 5	< 5
Propionitrile	--	< 20	< 20	< 20
Styrene	--	< 1	87	0.79J
Tetrachloroethene	0.8	< 1	< 1	< 1
Toluene	330	< 1	3.3	< 1
trans-1,2-Dichloroethene	700	< 1	< 1	< 1
trans-1,3-Dichloropropene	10[h]	< 1	< 1	< 1
trans-1,4-Dichloro-2-butene	--	< 2	< 2	< 2
Trichloroethene	2.7	< 1	< 1	< 1
Trichlorofluoromethane	--	< 1	< 1	< 1
Vinyl acetate	--	< 2	< 2	< 2
Vinyl chloride	2	< 1	< 1	< 1
Xylenes, Total	210	< 2	19	2.4

TABLE 17
SUMMARY OF CULVERT WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Sample Description : Sample Date/Time : Parameter	PADEP Statewide Surface Water Title 25, Chapter 16[b]	36" Pipe Influent 3/2/2004	On-Site Culvert 3/2/2004	36" Pipe Effluent 3/2/2004
Semivolatile Organic Compounds (ug/l)				
1,2,4,5-Tetrachlorobenzene	--	< 10	< 10	< 10
1,2,4-Trichlorobenzene	26	< 10	< 10	< 10
1,2-Dichlorobenzene (o-Dichlorobenzene)	160	< 10	< 10	< 10
1,3,5-Trinitrobenzene	--	< 10	< 10	< 10
1,3-Dichlorobenzene (m-Dichlorobenzene)	69	< 10	< 10	< 10
1,4-Dichlorobenzene (p-Dichlorobenzene)	150	< 10	< 10	< 10
1,4-Dioxane	--	< 10	< 10	< 10
1,4-Naphthoquinone	--	< 10	< 10	< 10
1,4-Phenylenediamine (p-Phenylenediamine)	--	< 2,000	< 2,000	< 2,000
1-Naphthylamine	--	< 10	< 10	< 10
2,2'-Oxybis(1-chloropropane)[bis(2-Chloroisopropyl)ether]	1,400	< 10	< 10	< 10
2,3,4,6-Tetrachlorophenol	--	< 10	< 10	< 10
2,4,5-Trichlorophenol	--	< 10	< 10	< 10
2,4,6-Trichlorophenol	2.1	< 10	< 10	< 10
2,4-Dichlorophenol	93	< 10	< 10	< 10
2,4-Dimethylphenol	130	< 10	< 10	< 10
2,4-Dinitrophenol	70	< 50	< 50	< 50
2,4-Dinitrotoluene	0.05	< 10	< 10	< 10
2,6-Dichlorophenol	--	< 10	< 10	< 10
2,6-Dinitrotoluene	0.05	< 10	< 10	< 10
2-Acetylaminofluorene	--	< 10	< 10	< 10
2-Chloronaphthalene	1,700	< 10	< 10	< 10
2-Chlorophenol	110	< 10	< 10	< 10
2-Methylnaphthalene	--	< 10	< 10	< 10
2-Naphthylamine	--	< 10	< 10	< 10
2-Nitroaniline (o-Nitroaniline)	--	< 50	< 50	< 50
2-Nitrophenol (o-Nitrophenol)	1,600	< 10	< 10	< 10
2-Picoline	--	< 10	< 10	< 10
3,3'-Dichlorobenzidine	0.04	< 20	< 20	< 20
3,3'-Dimethylbenzidine	--	< 20	< 20	< 20
3-Methylcholanthrene	--	< 10	< 10	< 10
3-Nitroaniline (m-Nitroaniline)	--	< 50	< 50	< 50
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	13.4	< 50	< 50	< 50
4-Aminobiphenyl	--	< 10	< 10	< 10
4-Bromophenylphenyl ether	--	< 10	< 10	< 10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	30	< 10	< 10	< 10
4-Chloroaniline (p-Chloroaniline)	--	< 20	< 20	< 20
4-Chlorophenylphenyl ether	--	< 10	< 10	< 10
4-Nitroaniline (p-Nitroaniline)	--	< 50	< 50	< 50
4-Nitrophenol (p-Nitrophenol)	470	< 50	< 50	< 50
4-Nitroquinoline-1-oxide	--	< 20	< 20	< 20
5-Nitro-o-toluidine	--	< 10	< 10	< 10
7,12-Dimethylbenz(a)anthracene	--	< 10	< 10	< 10
Acenaphthene	17	< 10	< 10	< 10
Acenaphthylene	--	< 10	< 10	< 10
Acetophenone	--	< 10	19	< 10
alpha,alpha-Dimethylphenethylamine	--	< 2,000	< 2,000	< 2,000
Aniline	--	< 20	< 20	< 20
Anthracene	9600	< 10	< 10	< 10
Aramite, Total	--	< 10	< 10	< 10
Benzo(a)anthracene	0.0044	< 10	< 10	< 10
Benzo(a)pyrene	0.0044	< 10	< 10	< 10
Benzo(b)fluoranthene	--	< 10	< 10	< 10
Benzo(g,h,i)perylene	--	< 10	< 10	< 10
Benzo(k)fluoranthene	0.0044	< 10	< 10	< 10
Benzyl alcohol	--	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	--	< 10	< 10	< 10
bis(2-Chloroethyl)ether	0.031	< 10	< 10	< 10
bis(2-Ethylhexyl)phthalate	1.8	< 10	< 10	< 10
Butylbenzylphthalate	35	< 10	< 10	< 10

CUMMINGS RITER

TABLE 17
SUMMARY OF CULVERT WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample Description : / Sample Date/Time :	PADEP Statewide Surface Water Title 25, Chapter 16[b]	36" Pipe Influent 3/2/2004	On-Site Culvert 3/2/2004	36" Pipe Effluent 3/2/2004
Semivolatile Organic Compounds cont'd.(ug/l)				
Chrysene	0.0044	< 10	< 10	< 10
Cresol (ortho)	--	< 10	< 10	< 10
Cresol, m & p	160[i]	< 10	< 10	< 10
Diallate, Total	--	< 10	< 10	< 10
Dibenzo(a,h)anthracene	0.0044	< 10	< 10	< 10
Dibenzofuran	--	< 10	< 10	< 10
Diethylphthalate	800	< 10	< 10	< 10
Dimethoate	--	< 10	< 10	< 10
Dimethylphthalate	500	< 10	< 10	< 10
Di-n-butylphthalate	21	< 10	< 10	< 10
Di-n-octylphthalate	--	< 10	< 10	< 10
Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	--	< 10	< 10	< 10
Disulfoton	--	< 10	< 10	< 10
Ethyl methanesulfonate	--	< 10	< 10	< 10
Ethyl parathion (Parathion)	--	< 10	< 10	< 10
Famphur	--	< 10	< 10	< 10
Fluoranthene	40	< 10	< 10	< 10
Fluorene	1,300	< 10	< 10	< 10
Hexachlorobenzene	0.00075	< 10	< 10	< 10
Hexachlorobutadiene	0.44	< 10	< 10	< 10
Hexachlorocyclopentadiene	1	< 10	< 10	< 10
Hexachloroethane	1.9	< 10	< 10	< 10
Hexachlorophene	--	< 5,000	< 5,000	< 5,000
Hexachloropropene	--	< 10	< 10	< 10
Indeno(1,2,3-cd)pyrene	0.0044	< 10	< 10	< 10
Isophorone	36	< 10	< 10	< 10
Isosafrole	--	< 10	< 10	< 10
m-Dinitrobenzene	--	< 10	< 10	< 10
Methapyrilene	--	< 2,000	< 2,000	< 2,000
Methyl methanesulfonate	--	< 10	< 10	< 10
Methyl parathion	--	< 10	< 10	< 10
Naphthalene	43	< 10	< 10	< 10
Nitrobenzene	17	< 10	< 10	< 10
N-Nitrosodiethylamine	0.00069	< 10	< 10	< 10
N-Nitrosodimethylamine	0.00069	< 10	< 10	< 10
N-Nitrosodi-n-butylamine	--	< 10	< 10	< 10
n-Nitrosodi-n-propylamine	0.005	< 10	< 10	< 10
N-Nitrosodiphenylamine	5	< 10	< 10	< 10
N-Nitrosomethylethylamine	--	< 10	< 10	< 10
N-Nitrosomorpholine	--	< 10	< 10	< 10
N-Nitrosopiperidine	--	< 10	< 10	< 10
N-Nitrosopyrrolidine	--	< 10	< 10	< 10
O,O,O-Triethyl phosphorothioate	--	< 10	< 10	< 10
o-Toluidine	--	< 10	< 10	< 10
p-(Dimethylamino)azobenzene	--	< 10	< 10	< 10
Pentachlorobenzene	--	< 10	< 10	< 10
Pentachloronitrobenzene	--	< 10	< 10	< 10
Pentachlorophenol	0.28	< 50	< 50	< 50
Phenacetin	--	< 10	< 10	< 10
Phenanthrene	1	< 10	< 10	< 10
Phenol	21,000	< 10	< 10	< 10
Phorate	--	< 10	< 10	< 10
Pronamide	--	< 10	< 10	< 10
Pyrene	960	< 10	< 10	< 10
Pyridine	--	< 50	< 50	< 50
Safrole	--	< 10	< 10	< 10
Sulfotepp (Tetraethyl dithiopyrophosphate)	--	< 10	< 10	< 10
Thionazin (o,o-Diethyl-O-pyrazinyl phosphorothioate)	--	< 10	< 10	< 10

CUMMINGS RITER

TABLE 17
SUMMARY OF CULVERT WATER ANALYTICAL RESULTS
CUMMINGS/RITER (2004)
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

Parameter / Sample Description : / Sample Date/Time :	PADEP Statewide Surface Water Title 25, Chapter 16[b]	36" Pipe Influent 3/2/2004	On-Site Culvert 3/2/2004	36" Pipe Effluent 3/2/2004
Inorganics (mg/l) [f]				
Antimony	14	< 20	< 20	< 20
Arsenic	50	< 10L	< 10L	< 10L
Barium	2,400	50	35	52
Beryllium	--	0.41J	< 4	< 4
Cadmium	2.2	< 5	< 5	< 5
Chromium	74	< 10	3.7B	< 10
Cobalt	19	5.5J	< 10	6.2J
Copper	9	2.8J	**49** [h]	2.9J
Lead	2.5	< 5L[g]	6.3B	< 5L
Mercury	0.05	< 0.2L	< 0.2L	< 0.2L
Nickel	52	42	47	42
Selenium	4.6	< 10L	8.4B	< 10L
Silver	750	< 10	< 10	< 10
Thallium	1.7	< 10L	**6.8B**	< 10L
Tin	--	< 50	< 50	< 50
Vanadium	100	1.1B[i]	3.7B	1.4B
Zinc	120	59	410	67

Notes:

(a) "ug/l" is micrograms per liter or parts per billion.

(b) Surface water samples were compared to the most stringent Surface Water Criteria (as defined by Title 25, Chapter 16, Appendix A, Table 1, November 18, 2000).

(c) "<x" indicates value less than method detection limit (MDL).

(d) "--" denotes a standard for this compound does not exist.

(e) "J" indicates an estimated value that is less than the reporting limit, but greater than instrument detection limit.

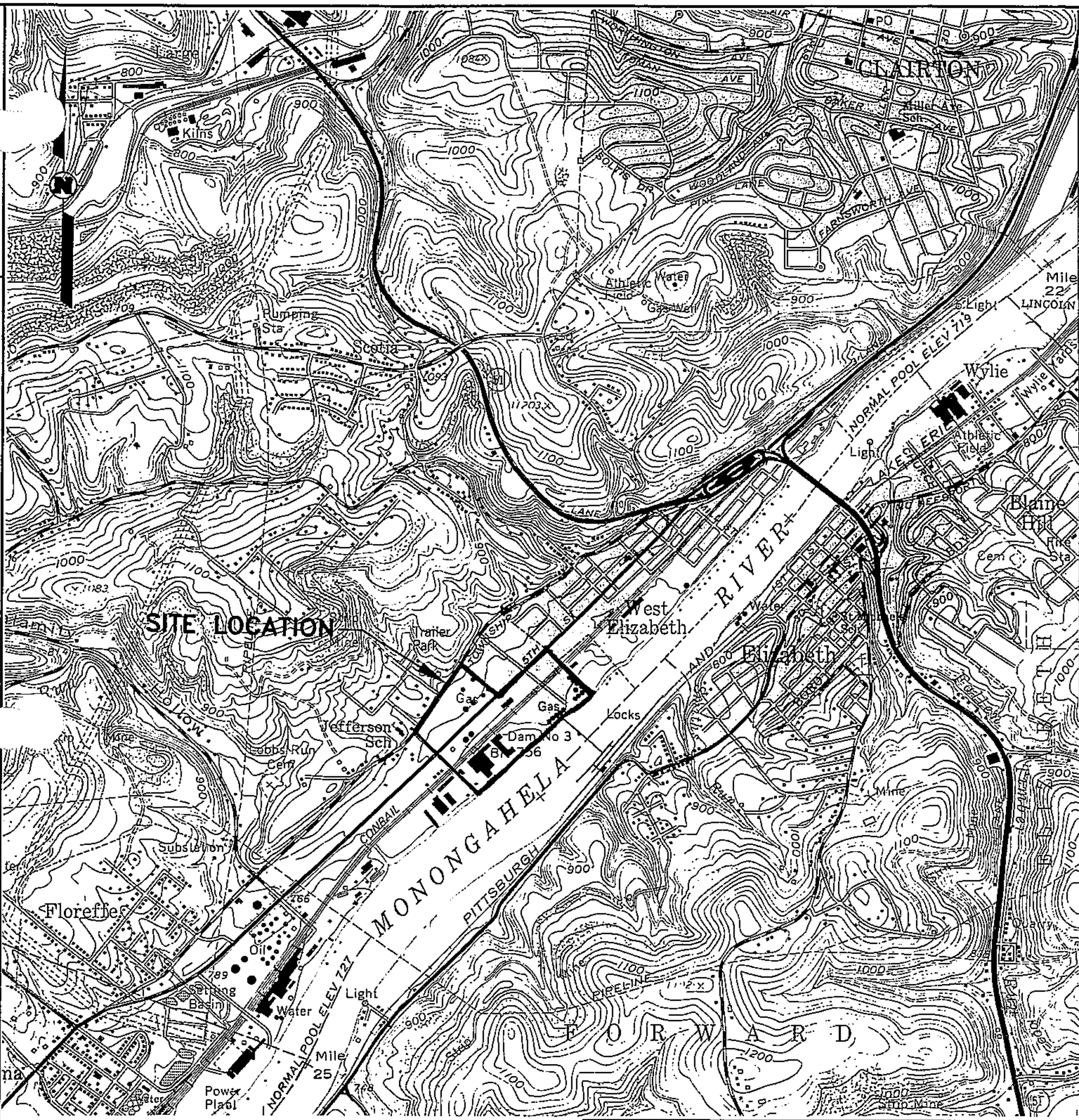
(f) "mg/l" is milligrams per liter or parts per million.

(g) "L" indicates a reported value may be biased low. Actual value is expected to be higher.

(h) Bold value exceeds the corresponding PADEP statewide Surface Water Criteria.

(i) "B" indicates not detected substantially above the level reported in the laboratory or field blanks.

FIGURES



SCALE

0 2000 4000 FEET

REFERENCES:

7.5–MIN. TOPOGRAPHIC QUADRANGLE
GLASSPORT, PA, DATED 1960,
PHOTOREVISED 1979,
SCALE 1:24000

QUADRANGLE LOCATION

FIGURE 1

SITE LOCATION MAP

FORMER JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

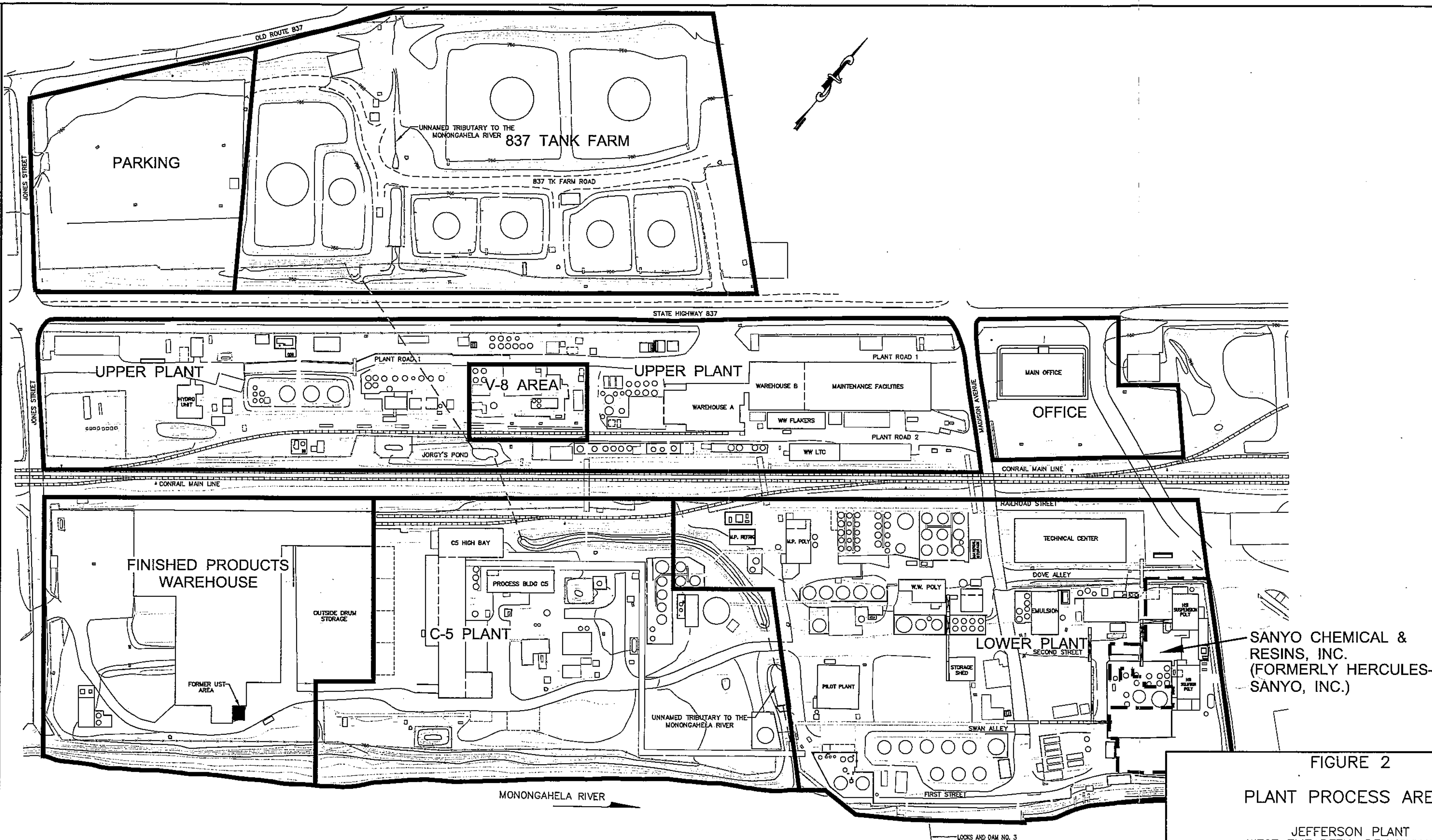
CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305A1

			DRAWN BY: T.N. Fitzroy	DATE: 4–22–03
			CHECKED BY: M.J. Valentine	DATE: 8-16-04
REVISION	DATE	DESCRIPTION	APPROVED BY: W. A. Baughman	DATE: 8-16-04

DRAWING NUMBER 01305A1

DRAWING NUMBER 01305B22



LEGEND

— — — UNNAMED TRIBUTARY TO MONONGAHELA RIVER (COVERED)

SCALE

0 180 360 FEET

FIGURE 2

PLANT PROCESS AREAS

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

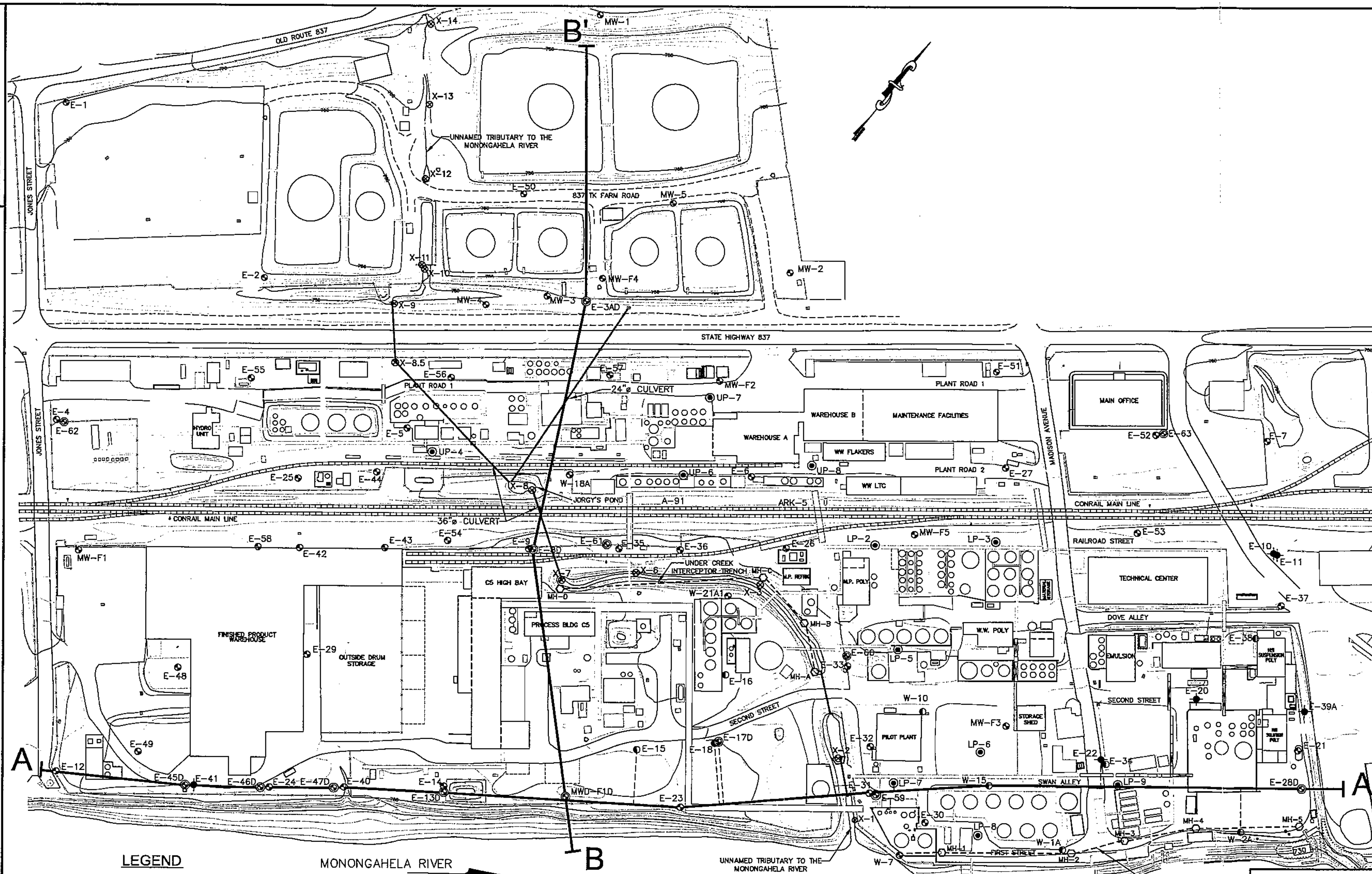
DRAWING NUMBER 01305B22

REVISION	DATE	DESCRIPTION

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

PLOT SCALE: 1=1

DRAWING NUMBER 01305B7



LEGEND

- E-6 SHALLOW MONITORING WELL LOCATION
- E-38 PERCHED MONITORING WELL LOCATION
- E-28D DEEP MONITORING WELL LOCATION
- X-13 SURFACE WATER MEASUREMENT LOCATION (STAFF GAUGE)
- E-10 ABANDONED OR INACCESSIBLE MONITORING WELL
- E-61 PIEZOMETER LOCATION
- STORMWATER CULVERT
- A—A' GEOLOGIC CROSS SECTION

SCALE

0 180 360 FEET

REVISION	DATE	DESCRIPTION	
DRAWN BY:	T.E. McKee	DATE:	3-15-04
CHECKED BY:	M.J. Valentine	DATE:	8-16-04
APPROVED BY:	W.A. Baughman	DATE:	8-16-04

FIGURE 3

SITE PLAN

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

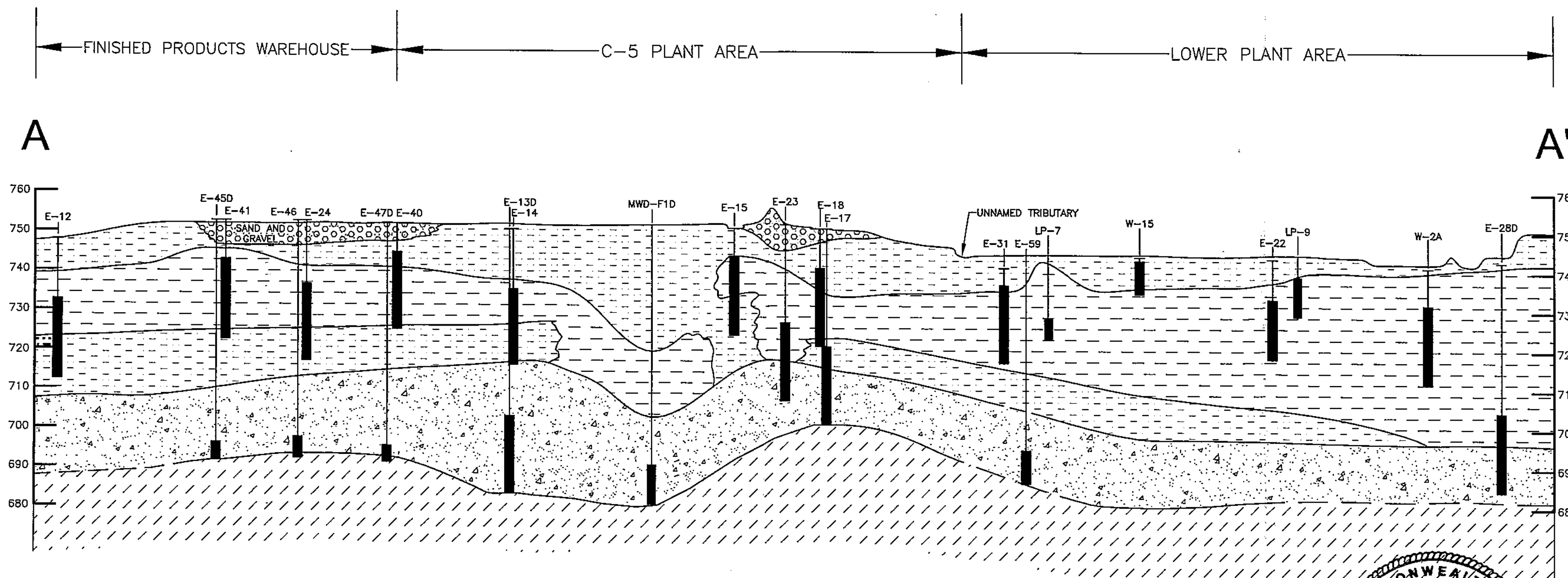
PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B7

PLOT SCALE: 1=1.

DRAWING NUMBER 01305B24



VIEW LOOKING NORTHWEST

NOTES

1. SEE FIGURE 3 FOR PLAN LOCATION OF HYDROGEOLOGIC CROSS-SECTIONS.
2. THE BORING LOGS AND RELATED INFORMATION DEPICTED SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SOIL CONDITIONS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS. ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THESE BORING LOCATIONS.
3. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN THE TEST BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE TEST BORINGS AND IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN THE TEST BORINGS MAY VARY FROM THOSE INDICATED.

LEGEND

- SAND AND GRAVEL
- SILTY SAND/SANDY SILT
- CLAYEY SILT/SILTY CLAY
- SAND TO TRACE GRAVEL
- CASSELMAN FORMATION

VERTICAL SCALE
0 10 20 30 60

HORIZONTAL SCALE
0 60 120 180 360

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MATTHEW J. VALENTINE
GEOLOGIST No. PG-000820-G

Matthew J. Valentine 8-16-04

REFERENCE:
MANAGEMENT AND TECHNICAL RESOURCES, INC. DRAWING TITLED "GEOLOGIC CROSS SECTION A-A'," DRAWING NUMBER: 01005005, DATED: 1-28-02.

PLOT SCALE: 1=1

REVISION	DATE	DESCRIPTION

FIGURE 4

GEOLOGIC CROSS SECTION A-A'

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

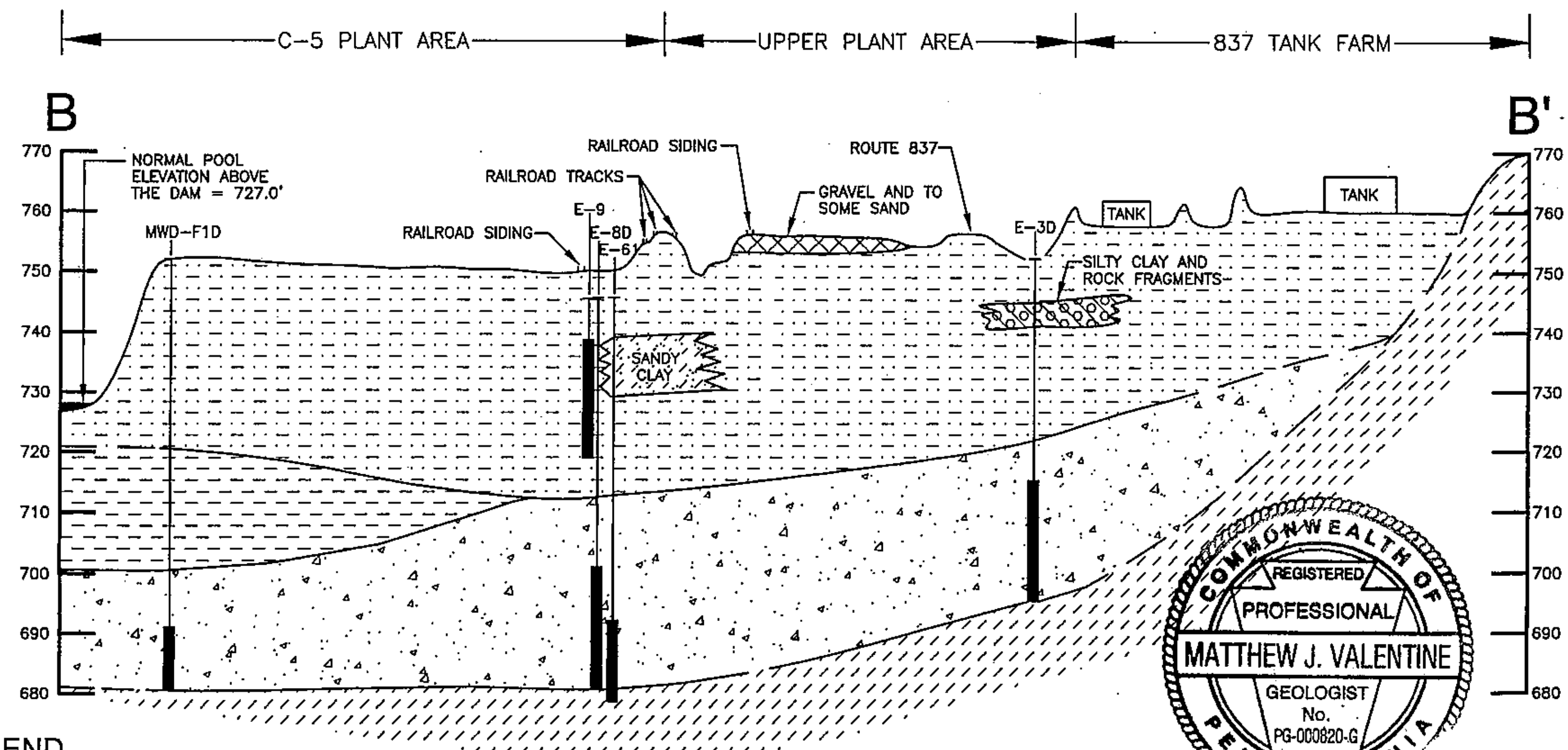
PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B24

DRAWN BY: T.N. Fitzroy	DATE: 4-2-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

DRAWING NUMBER 0 5A3



VIEW LOOKING SOUTHWEST

LEGEND

- SILTY SAND
- SILTY CLAY
- SAND AND TO TRACE GRAVEL
- CASSELMAN FORMATION

NOTE

1. SEE NOTES FROM FIGURE 4

VERTICAL SCALE

0 10 20 30 60

HORIZONTAL SCALE

0 60 120 180 360

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MATTHEW J. VALENTINE
GEOLOGIST No. PG-000820-G

Matt J. Valentine 8-16-04

FIGURE 5

GEOLOGIC CROSS SECTION B-B'

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

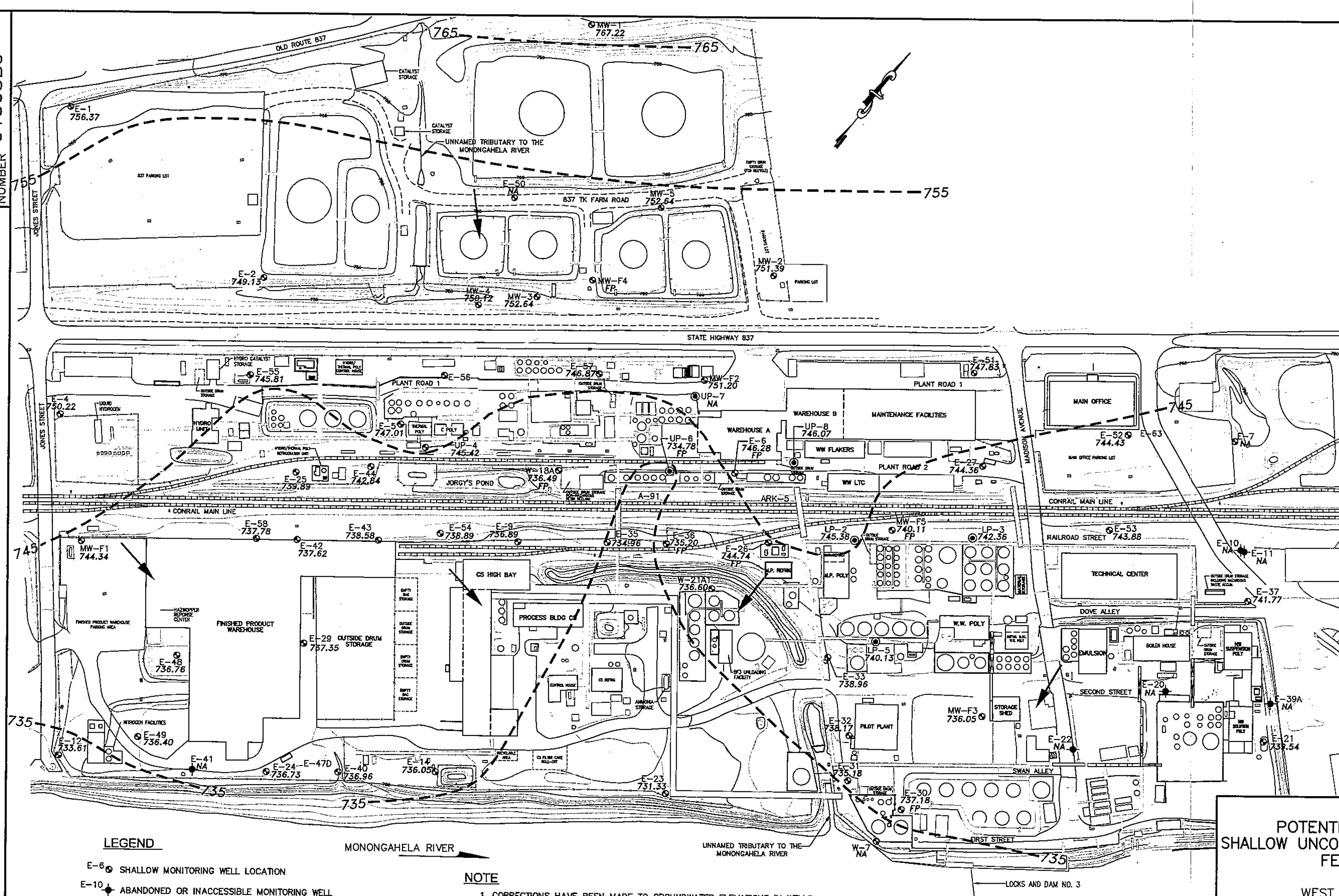
DRAWING NUMBER 01305A3

REFERENCE: MANAGEMENT AND TECHNICAL RESOURCES, INC. DRAWING TITLED, "GEOLOGIC CROSS SECTION B-B'," DRAWING NUMBER 01005006, DATED: 1-28-02

REVISION	DATE	DESCRIPTION

DRAWN BY:	T.N. Fitzroy	DATE:	4-2-04
CHECKED BY:	M.J. Valentine	DATE:	8-16-04
APPROVED BY:	W.A. Baughman	DATE:	8-16-04

DRAWING NUMBER 01305B9



COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL GEOLOGIST
MATTHEW J. VALENTINE
No. PG-000820-G

Matt J. Valentine 8-16-04

LEGEND

- E-6 SHALLOW MONITORING WELL LOCATION
- E-10 ABANDONED OR INACCESSIBLE MONITORING WELL
- E-61 PIEZOMETER LOCATION
- - - - POTENTIOMETRIC SURFACE CONTOUR (IN FEET ABOVE SEA LEVEL (FT-MSL))
- 736.96 GROUNDWATER ELEVATION ON FEBRUARY 13, 2004 (FT-MSL)
- ← APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- NA WATER LEVEL NOT ABLE TO BE MEASURED
- FP LNAPL DETECTED

NOTE

1. CORRECTIONS HAVE BEEN MADE TO GROUNDWATER ELEVATIONS IN WELLS WITH MEASURABLE LNAPL LEVELS. CALCULATIONS WERE PERFORMED TO ACCOUNT FOR WATER TABLE DEFLECTION CAUSED BY LNAPL.

SCALE
0 180 360 FEET

REVISION	DATE	DESCRIPTION

FIGURE 6
POTENTIOMETRIC SURFACE MAP SHALLOW UNCONSOLIDATED GROUNDWATER ZONE FEBRUARY 13, 2004

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

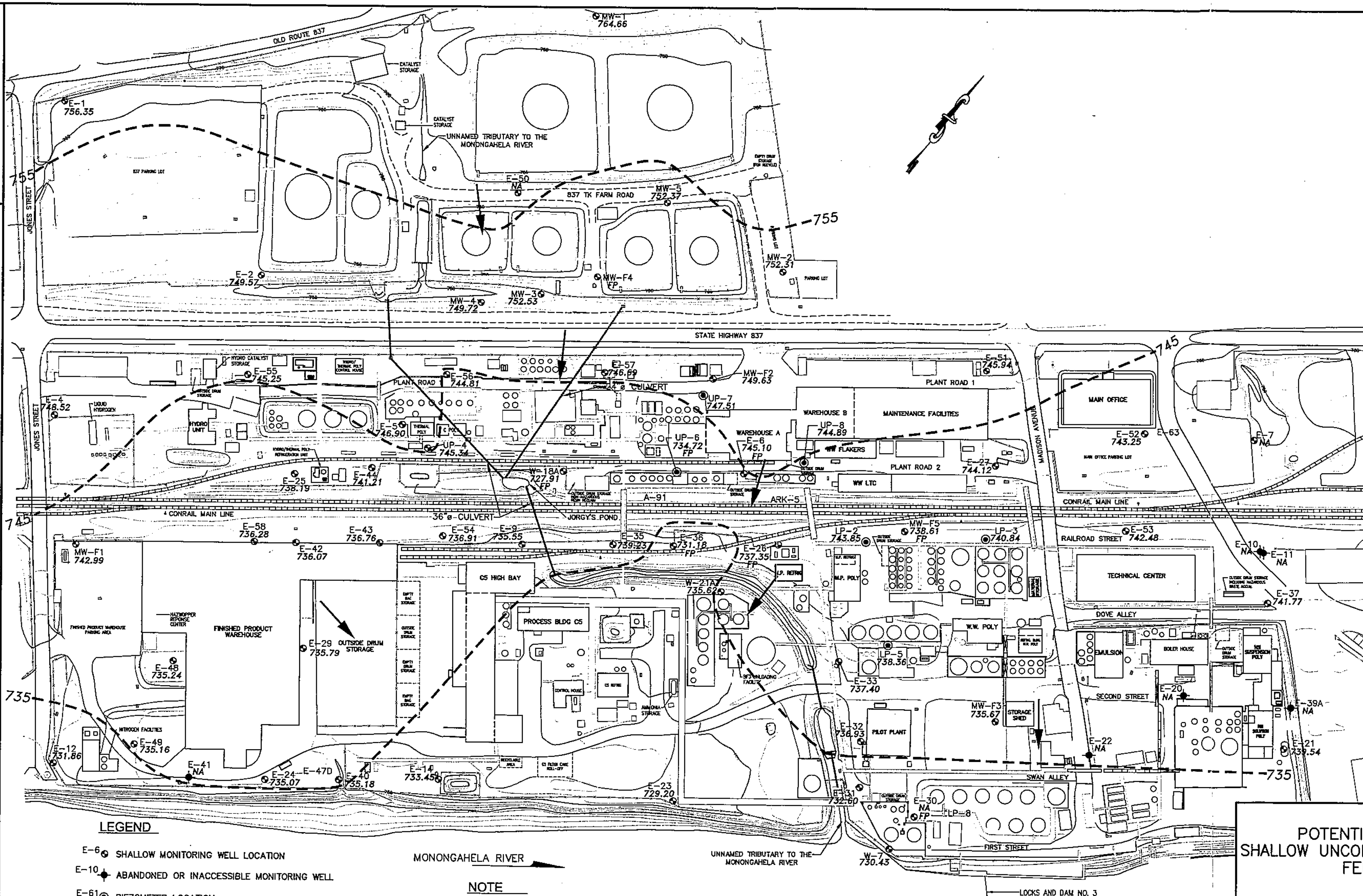
CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B9

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

PLOT SCALE: 1=1

DRAWING NUMBER 01305B18



LEGEND

Symbol	Description
E-6 ⊗	SHALLOW MONITORING WELL LOCATION
E-10 ◆	ABANDONED OR INACCESSIBLE MONITORING WELL
E-61 ◎	PIEZOMETER LOCATION
———	STORMWATER CULVERT
– – –	PIEZOMETIC SURFACE CONTOUR (IN FEET ABOVE SEA LEVEL (FT-MSL))
736.96	GROUNDWATER ELEVATION ON FEBRUARY 26, 2004 (FT-MSL)
←	APPROXIMATE DIRECTION OF GROUNDWATER FLOW
NA	WATER LEVEL UNABLE TO BE MEASURED
FP	LNAPL DETECTED

NOTE

1. CORRECTIONS HAVE BEEN MADE TO GROUNDWATER ELEVATIONS IN WELLS WITH MEASURABLE LNAPL LEVELS. CALCULATIONS WERE PERFORMED TO ACCOUNT FOR WATER TABLE DEFLECTION CAUSED BY LNAPL.

SCALE
0 180 360 FEET

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MATTHEW J. VALENTINE
GEOLOGIST
No. PG-000820-G

8-16-04

PLOT SCALE: 1=1

REVISION	DATE	DESCRIPTION

FIGURE 7
POTENTIOMETRIC SURFACE MAP
SHALLOW UNCONSOLIDATED GROUNDWATER ZONE
FEBRUARY 26, 2004

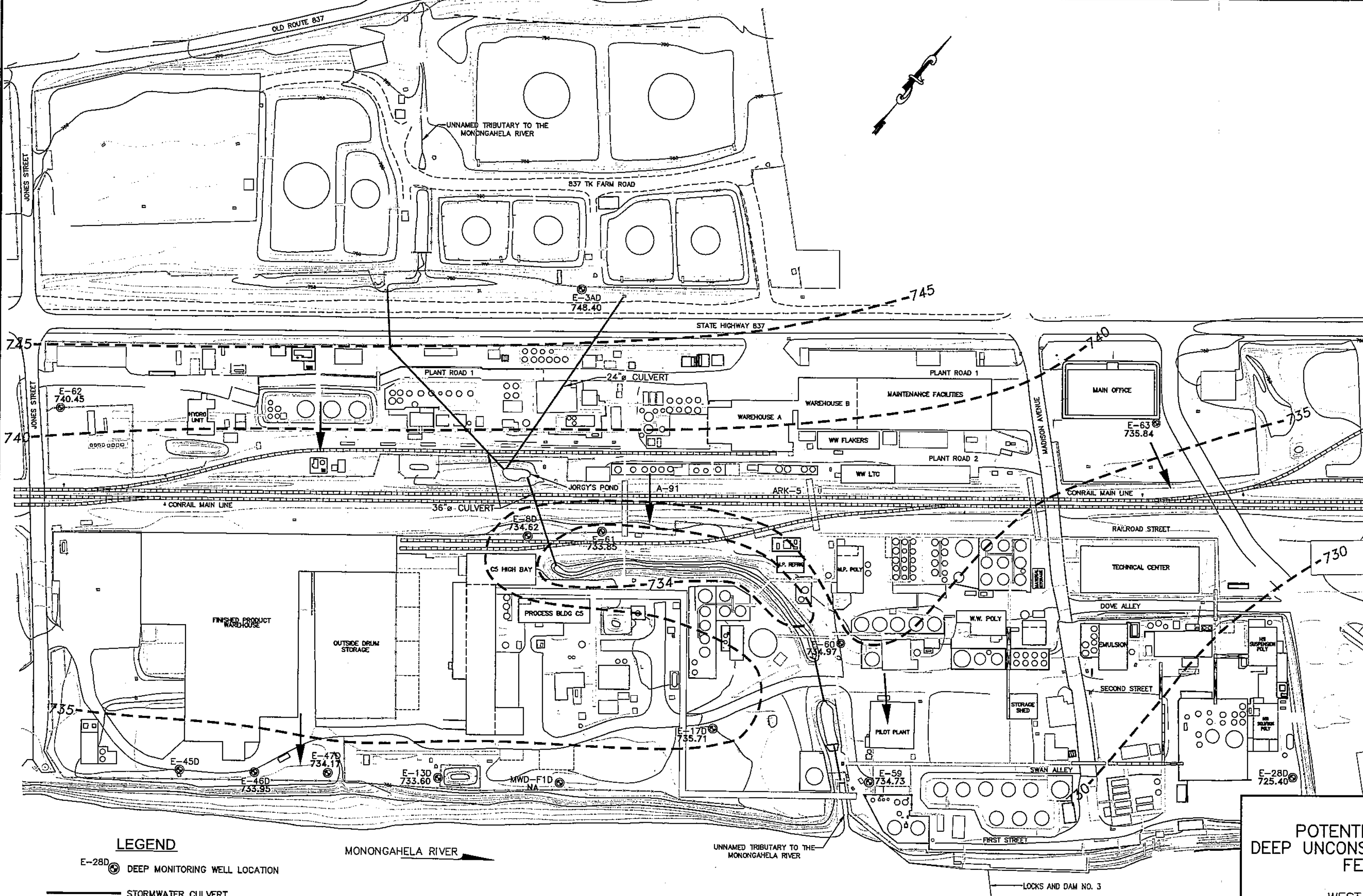
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B18

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04



DRAWING NUMBER 01305B12

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MATTHEW J. VALENTINE
GEOLOGIST
No. PG-000820-G

Matt J. Valentine
8-16-04

LEGEND

E-28D ⊛	DEEP MONITORING WELL LOCATION
———	STORMWATER CULVERT
– – – –	POTENTIOMETRIC SURFACE CONTOUR (IN FEET ABOVE SEA LEVEL (FT-MSL))
748.40	GROUNDWATER ELEVATION ON FEBRUARY 13, 2004 (FT-MSL)
←	APPROXIMATE DIRECTION OF GROUNDWATER FLOW
NA	WATER LEVEL UNABLE TO BE MEASURED

SCALE
0 180 360 FEET

PLOT SCALE: 1=1

FIGURE 8

POTENTIOMETRIC SURFACE MAP DEEP UNCONSOLIDATED GROUNDWATER ZONE FEBRUARY 13, 2004

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B12

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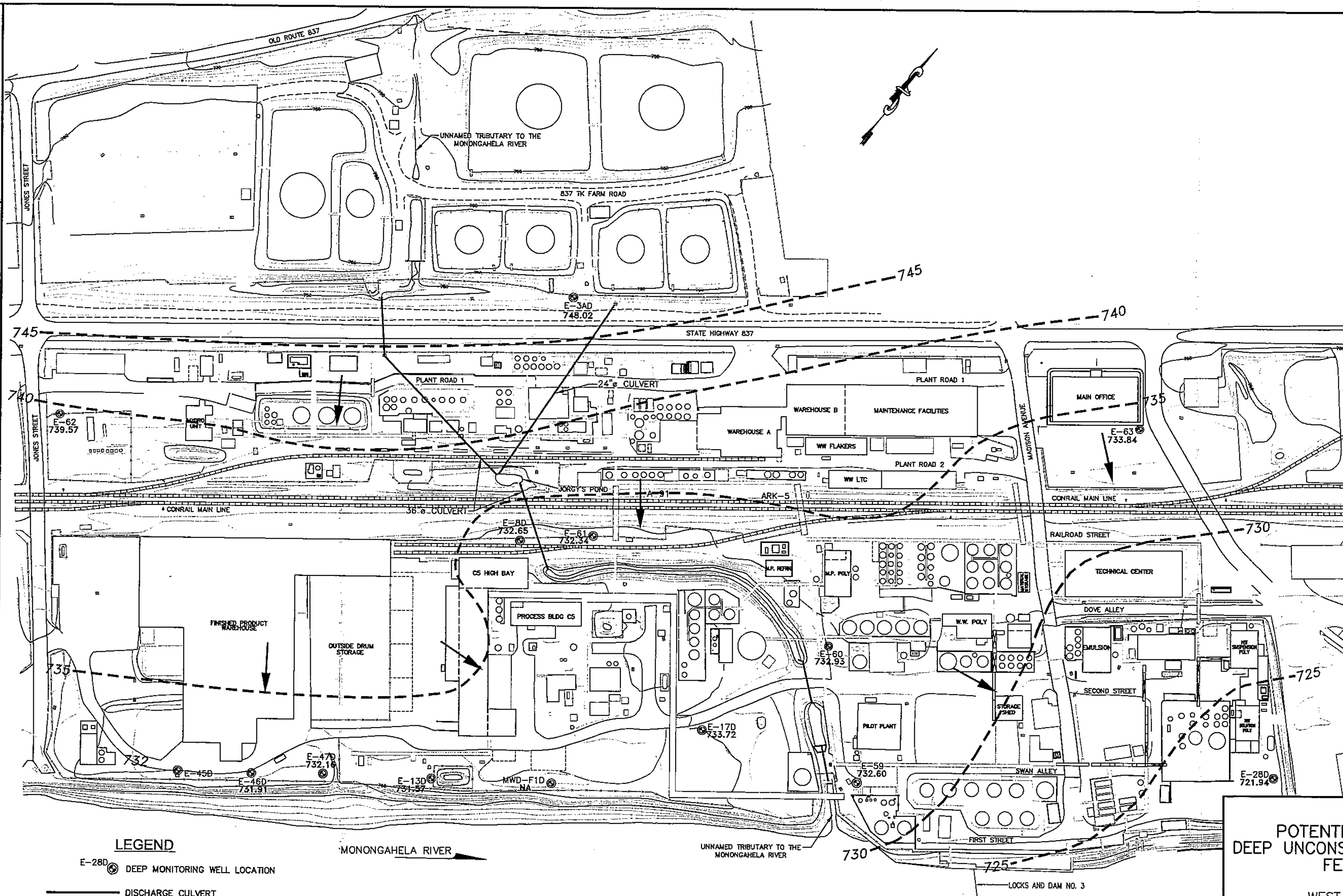

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MATTHEW J. VALENTINE
GEOLOGIST
No. PG-000820-G

Matt J. Valent
8-16-04

LEGEND

E-28D ◎ DEEP MONITORING WELL LOCATION

——— DISCHARGE CULVERT

– – – – POTENTIOMETRIC SURFACE CONTOUR (IN FEET ABOVE SEA LEVEL (FT-MSL))

732.16 GROUNDWATER ELEVATION ON FEBRUARY 26, 2004 (FT-MSL)

← APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NA WATER LEVEL UNABLE TO BE MEASURED

SCALE

0 180 360 FEET

REVISION	DATE	DESCRIPTION

FIGURE 9

POTENTIOMETRIC SURFACE MAP DEEP UNCONSOLIDATED GROUNDWATER ZONE FEBRUARY 26, 2004

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

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DRAWN BY: *T.E. McKee*	DATE: *3-15-04*
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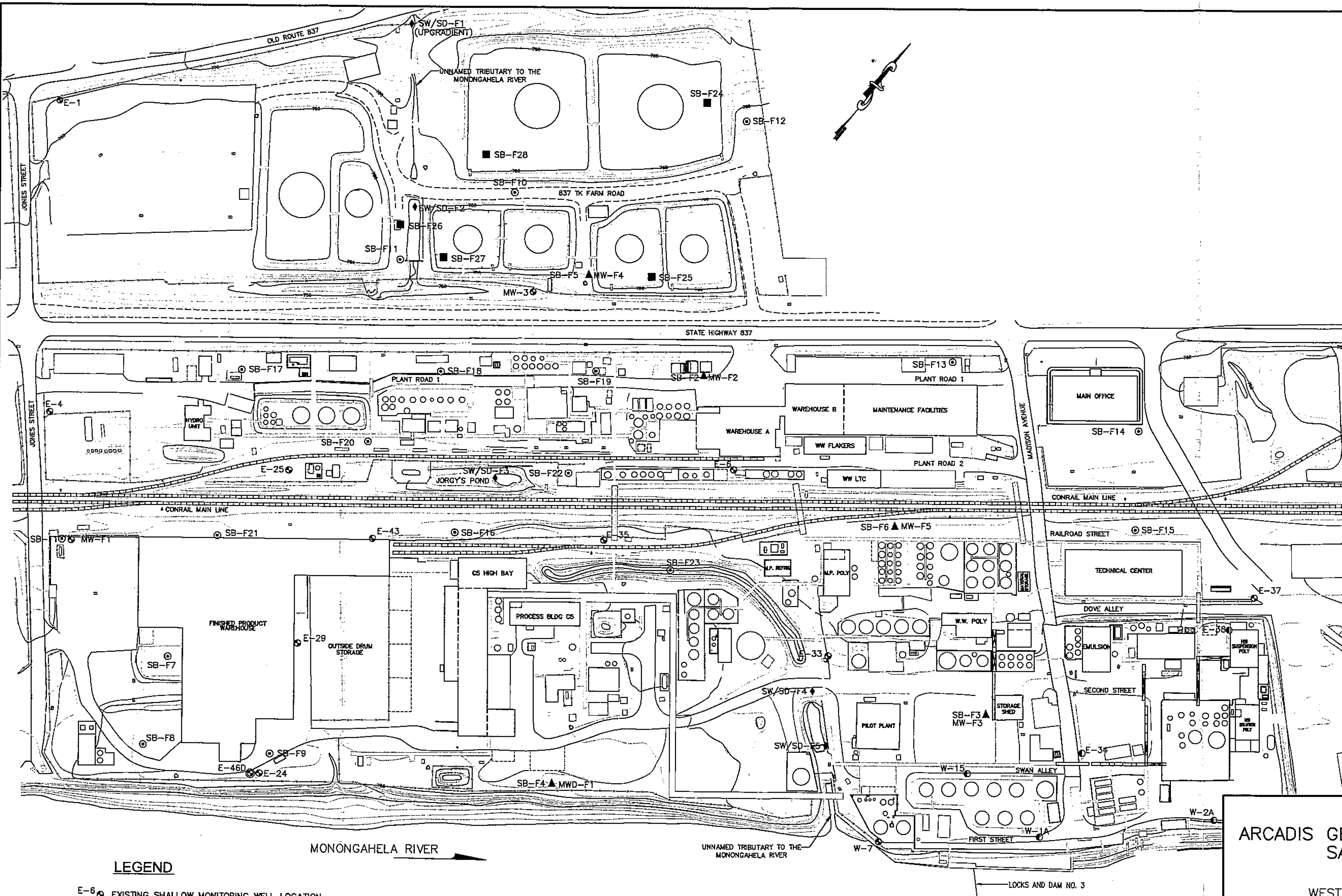
APPROVED BY: *W.A. Baughman*	DATE: *8-16-04*

PLOT SCALE: 1=1



DRAWING NUMBER 01305B23

LEGEND

- E-6 ⊗ EXISTING SHALLOW MONITORING WELL LOCATION
- E-34 ◐ EXISTING PERCHED MONITORING WELL LOCATION
- E-28D ◎ EXISTING DEEP MONITORING WELL LOCATION
- SB-F9 ⊙ ARCADIS TEMPORARY MONITOR WELL/SOIL BORING
- SB-F3 ▲ ARCADIS PERMANENT MONITOR WELL/SOIL BORING
- SB-F27 ■ ARCADIS SOIL BORING
- SW/SD-F4 ♦ ARCADIS SURFACE WATER/SEDIMENT SAMPLING LOCATION

SCALE

0 180 360 FEET

PLOT SCALE: 1=1

REVISION	DATE	DESCRIPTION

FIGURE 10

ARCADIS GERAGHTY AND MILLER, INC. SAMPLE LOCATIONS

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B23

DRAWN BY: T.E. McKee	DATE: 3-15-04
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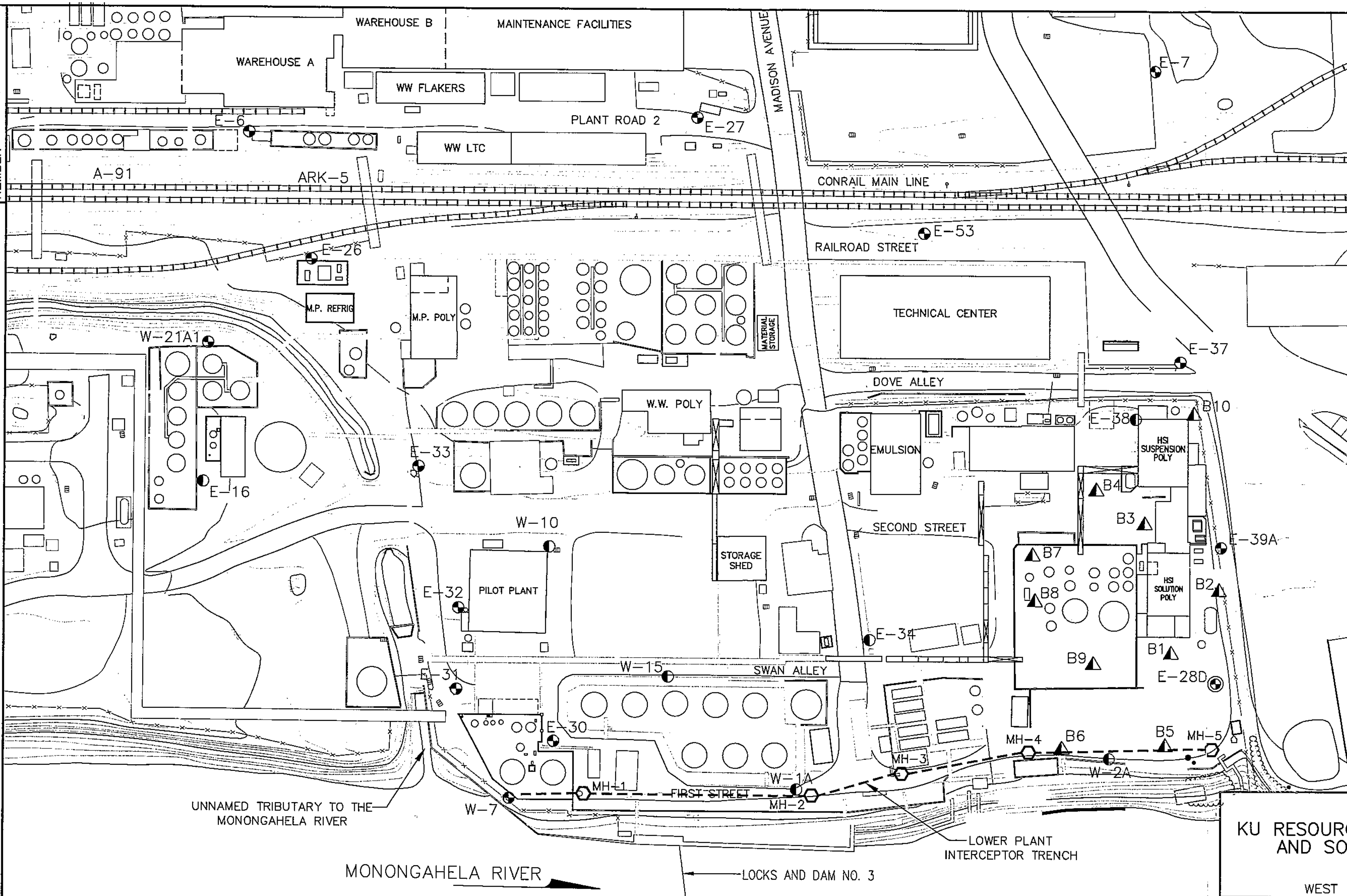
APPROVED BY: W.A. Baughman	DATE: 8-16-04



LEGEND

- E-6 EXISTING SHALLOW MONITORING WELL LOCATION
- E-38 EXISTING PERCHED MONITORING WELL LOCATION
- B6 KU RESOURCES BORING LOCATIONS
- MH-1 LPIT MANHOLE LOCATION

NOTE

BORING LOCATIONS ARE APPROXIMATE

SCALE

0 100 200 FEET

REVISION	DATE	DESCRIPTION

FIGURE 11

KU RESOURCES, INC. WELL SAMPLING AND SOIL BORING LOCATIONS

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

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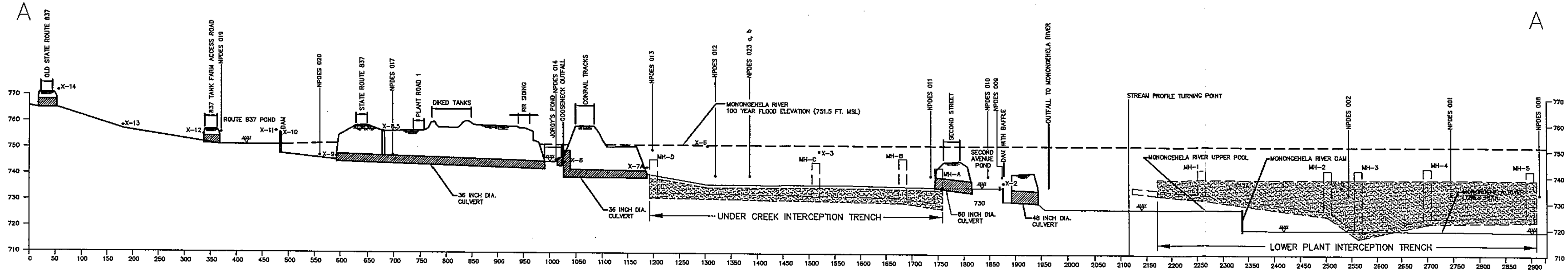
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

DRAWING NUMBER 01305B28

PLOT SCALE: 1=

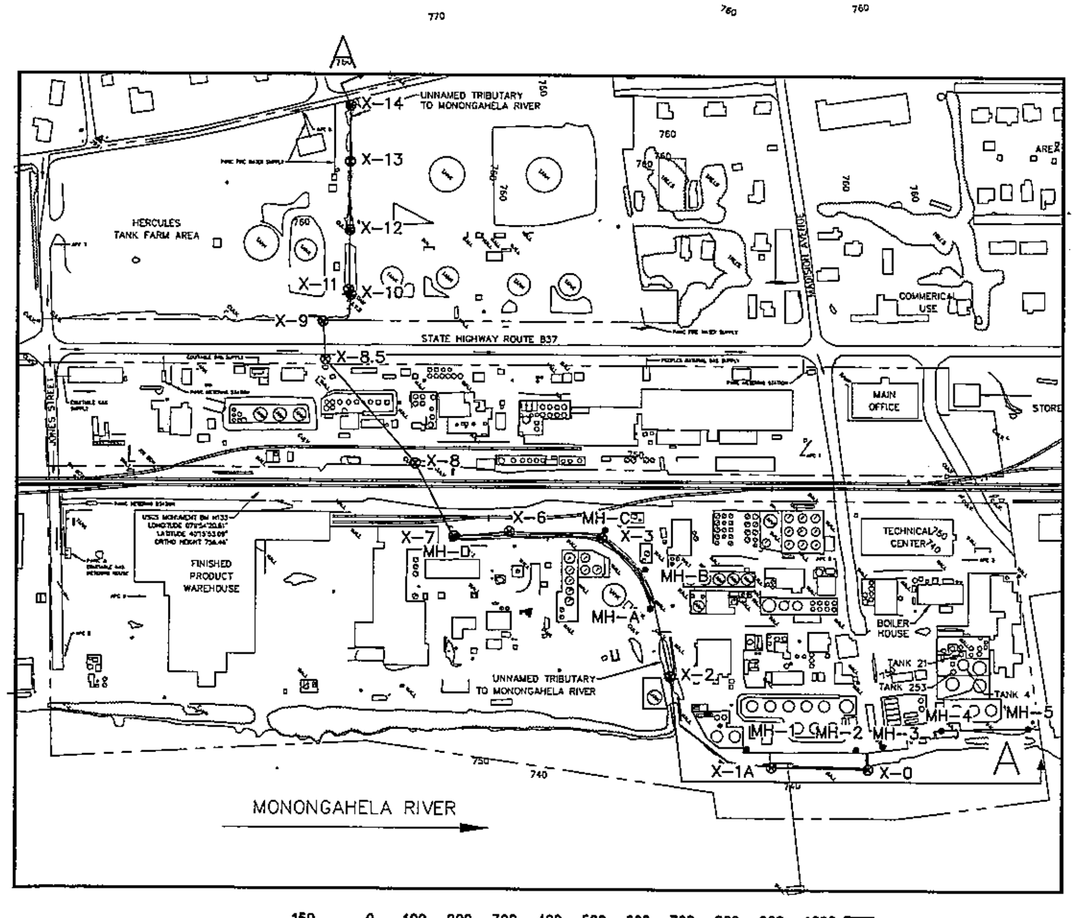


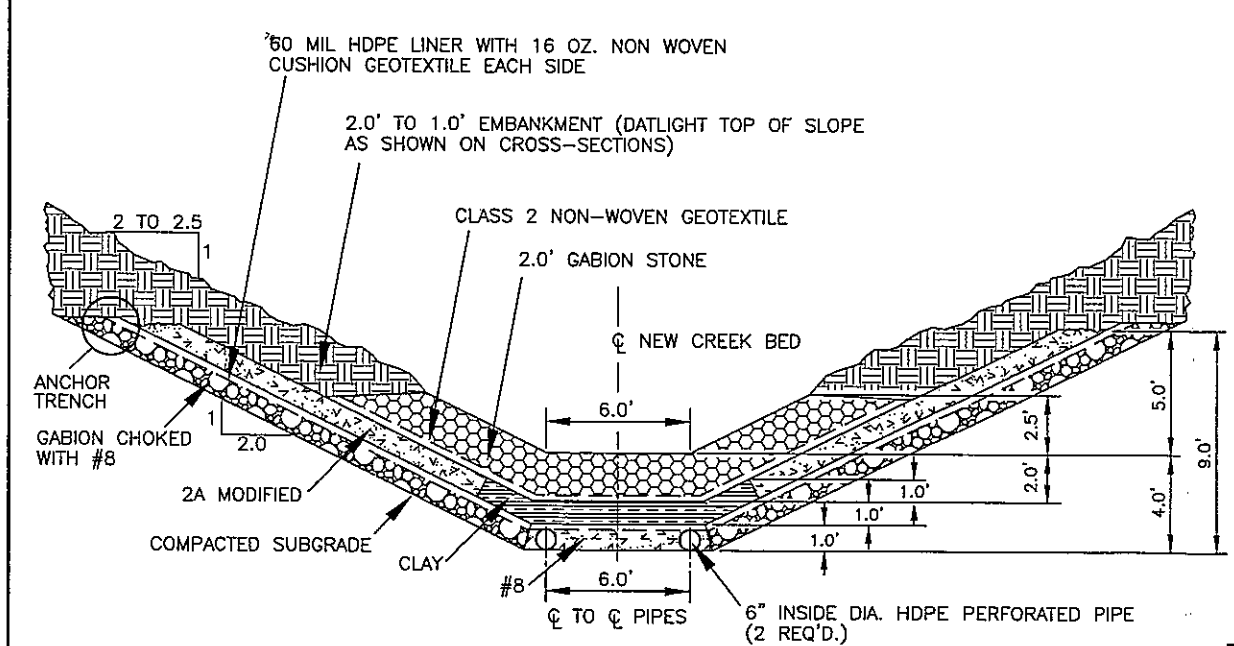
STREAM PROFILE A–A

(SURFACE ALONG THE CENTER LINE OF THE UNNAMED TRIBUTARY)
SCALE: VERT. 1" = 40'
HORIZ. 1" = 200'

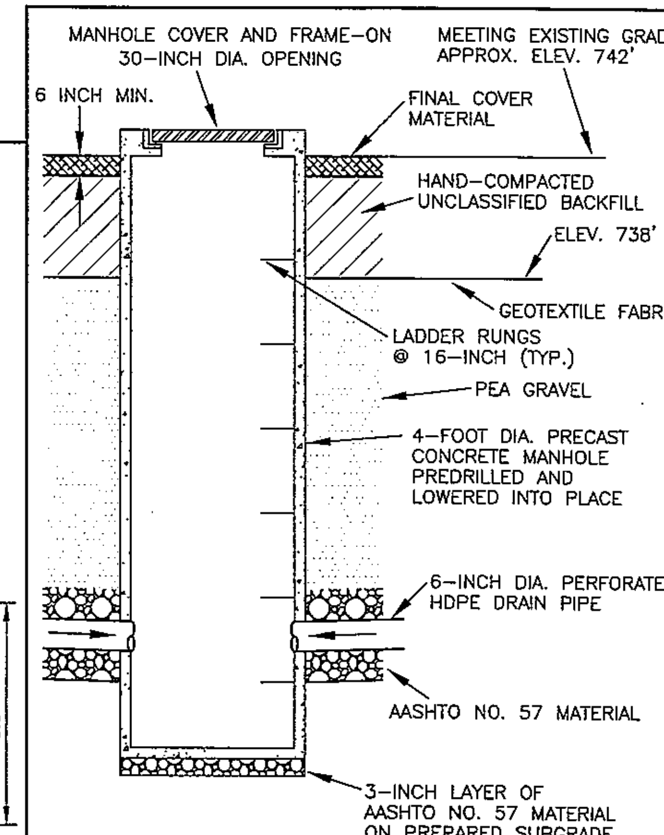
KEY

- •X-0 REFERENCE MEASUREMENT POINTS FOR SURFACE WATER MONITORING.
- MH-D MANHOLE IN INTERCEPTION TRENCH (MANHOLE AND PIPING DASHED)
- AGGREGATE IN INTERCEPTION TRENCH
- CULVERT PIPE
- WATER SURFACE





TYPICAL SHOWING VERTICAL CROSS SECTIONED PROFILE OF THE UNDER CREEK INTERCEPTOR TRENCH



TYPICAL SHOWING VERTICAL CROSS SECTIONED PROFILE OF THE LOWER PLANT INTERCEPTOR TRENCH

NOTE: ELEVATION OF PIPE INVERT BOTTOM OF MANHOLE SUMP IS VARIED.

REFERENCE: MANAGEMENT AND TECHNICAL RESOURCES, INC. DRAWING NO. 01005015, DATED 2-11-02.

FIGURE 12

HYDRAULIC PROFILE SHOWING THE HORIZONTAL AND VERTICAL EXTENT OF THE LPIT AND UCIT AND TYPICAL VERTICAL PROFILES

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES CORPORATION
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B26

REVISION	DATE	DESCRIPTION

DRAWN BY: T.N. Fitzroy	DATE: 4-2-04
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APPROVED BY: W.A. Baughman	DATE: 8-16-04

DRAWING NUMBER 01305B26

PLOT SCALE: 1

DRAWING NUMBER 01305B31

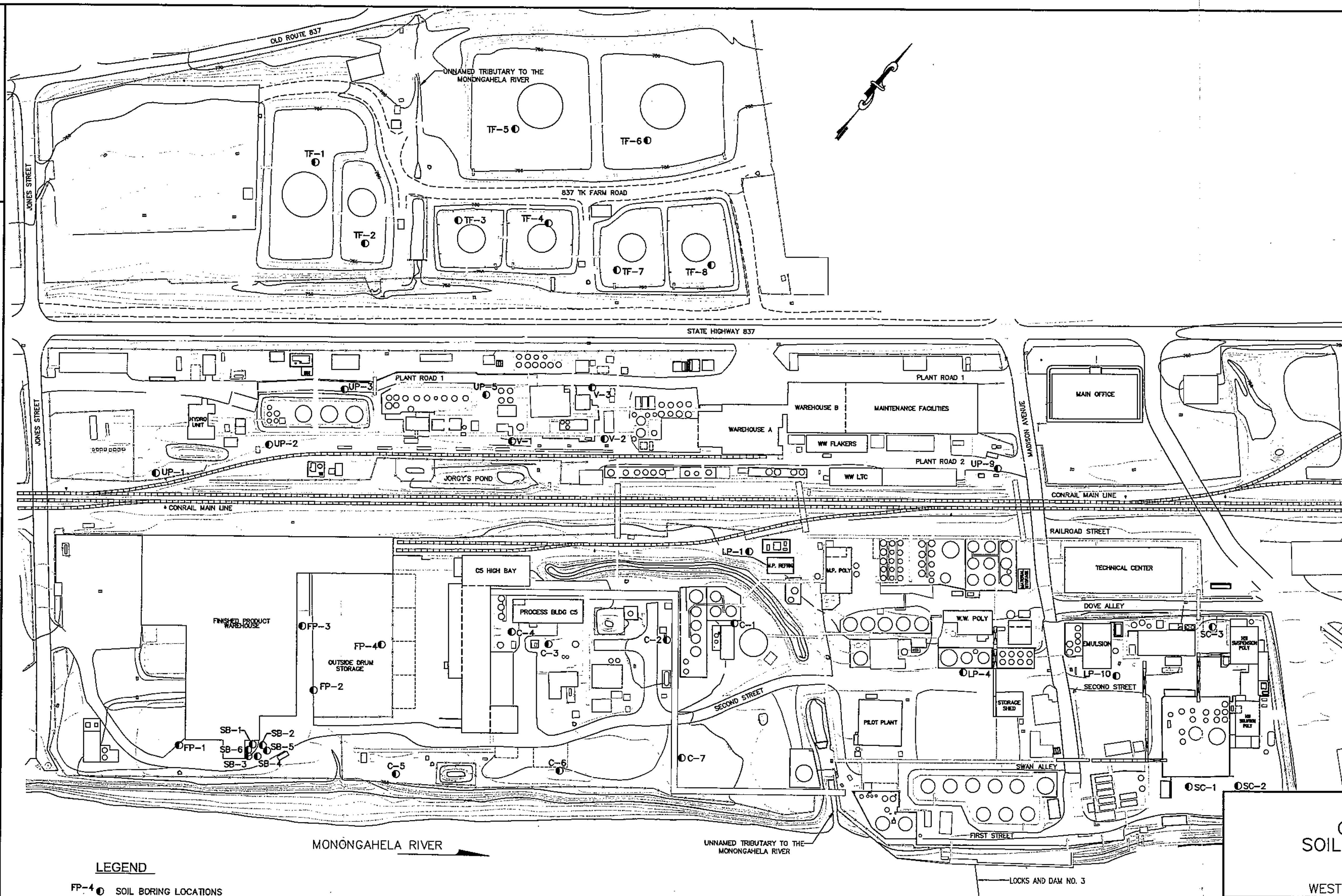


FIGURE 13

CUMMINGS/RITER SOIL BORING LOCATIONS

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

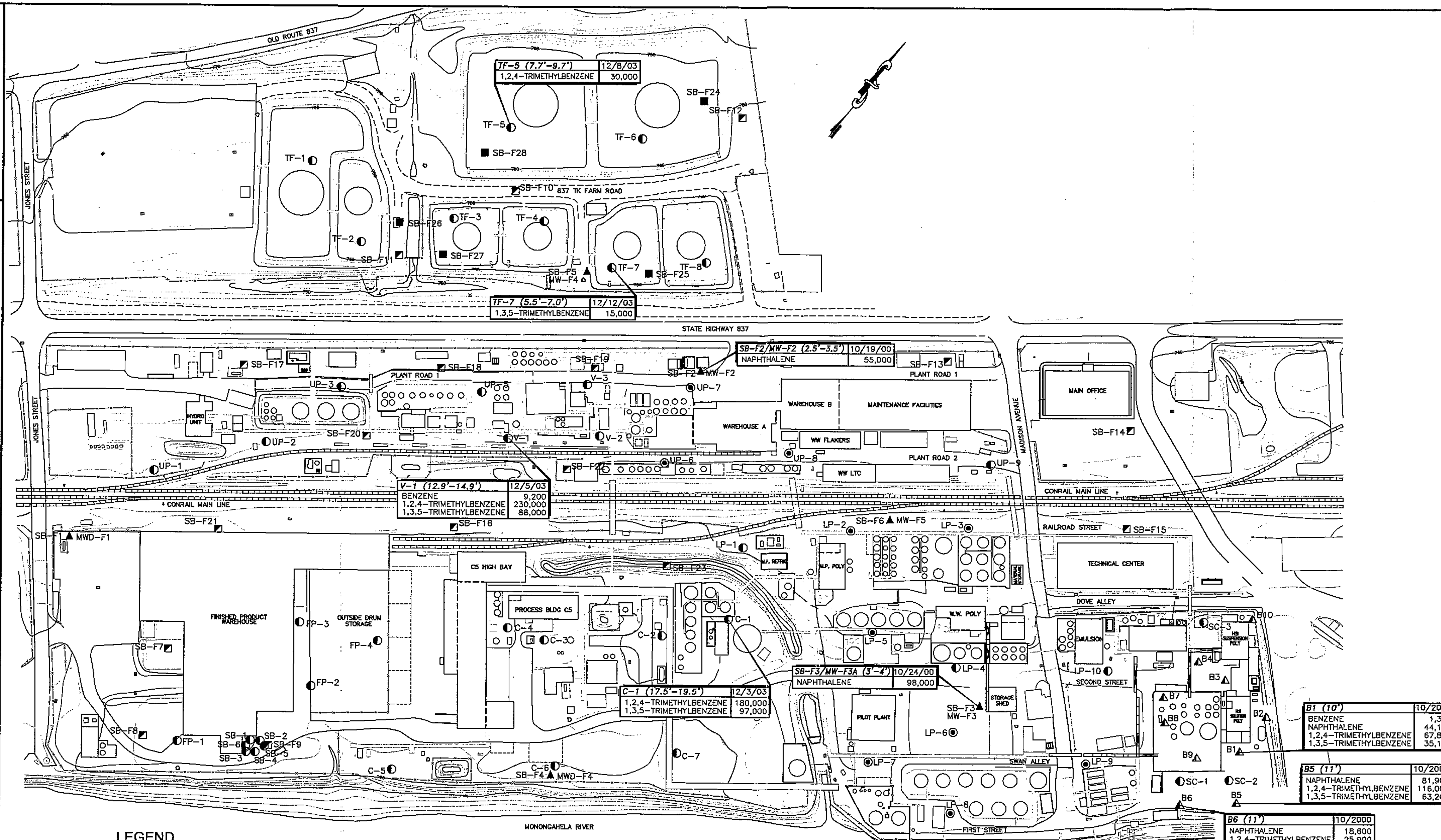
DRAWING NUMBER 01305B31

REVISION	DATE	DESCRIPTION

DRAWN BY: T.E. McKee	DATE: 4-2-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

PLOT SCALE: 1=1

DRAWING NUMBER 01305B16



SCALE

0 180 360 FEET

LEGEND

- C-5 ◐ CUMMINGS/RITER SOIL BORING LOCATIONS
- LP-8 ◉ CUMMINGS/RITER PIEZOMETER LOCATIONS
- B6 ▲ KU RESOURCES BORING LOCATIONS
- SB-F16 ◩ ARCADIS TEMPORARY MONITORING WELL/SOIL BORING LOCATIONS
- MWD-F4 / SB-F4 ▲ ARCADIS PERMANENT MONITORING WELL/SOIL BORING LOCATION
- SB-F25 ■ ARCADIS SOIL BORING LOCATION

NOTES

1. CONCENTRATIONS ARE IN MICROGRAMS PER KILOGRAM (µg/kg) OR PARTS PER BILLION (ppb).
2. CONCENTRATIONS HAVE BEEN COMPARED TO PADEP ACT 2 SOIL-TO-GROUNDWATER, USED AQUIFER, NON-RESIDENTIAL, TDS<2,500 MSCs.

PLOT SCALE: 1=1

REVISION	DATE	DESCRIPTION

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

FIGURE 14

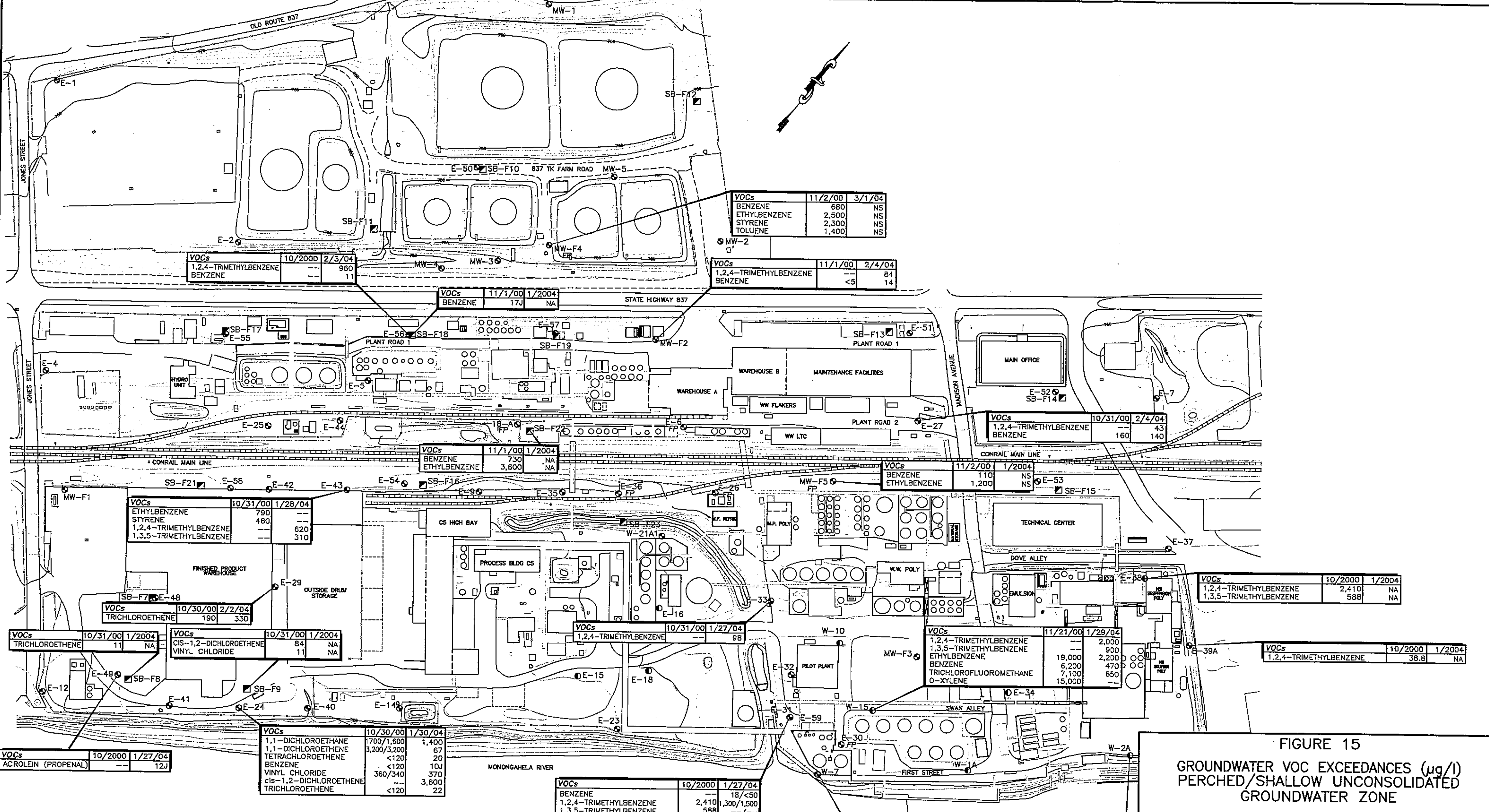
SUBSURFACE SOILS – SOIL TO GROUNDWATER MSC EXCEEDANCES

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B16



VOCs	11/2/00	3/1/04
BENZENE	680	NS
ETHYLBENZENE	2,500	NS
STYRENE	2,300	NS
TOLUENE	1,400	NS

VOCs	10/2000	2/3/04
1,2,4-TRIMETHYLBENZENE	--	960
BENZENE	--	11

VOCs	11/1/00	2/4/04
1,2,4-TRIMETHYLBENZENE	--	84
BENZENE	<5	14

VOCs	11/1/00	1/2004
BENZENE	17J	NA

VOCs	10/31/00	2/4/04
1,2,4-TRIMETHYLBENZENE	--	43
BENZENE	160	140

VOCs	11/1/00	1/2004
BENZENE	730	NA
ETHYLBENZENE	3,600	NA

VOCs	11/2/00	1/2004
BENZENE	110	NS
ETHYLBENZENE	1,200	NS

VOCs	10/31/00	1/28/04
ETHYLBENZENE	790	--
STYRENE	460	--
1,2,4-TRIMETHYLBENZENE	--	620
1,3,5-TRIMETHYLBENZENE	--	310

VOCs	10/30/00	2/2/04
TRICHLOROETHENE	190	330

VOCs	10/31/00	1/2004
TRICHLOROETHENE	11	NA

VOCs	10/31/00	1/2004
CIS-1,2-DICHLOROETHENE	84	NA
VINYL CHLORIDE	11	NA

VOCs	10/31/00	1/27/04
1,2,4-TRIMETHYLBENZENE	--	98

VOCs	10/2000	1/2004
1,2,4-TRIMETHYLBENZENE	2,410	NA
1,3,5-TRIMETHYLBENZENE	588	NA

VOCs	10/2000	1/2004
1,2,4-TRIMETHYLBENZENE	38.8	NA

VOCs	11/21/00	1/29/04
1,2,4-TRIMETHYLBENZENE	--	2,000
1,3,5-TRIMETHYLBENZENE	--	900
ETHYLBENZENE	19,000	2,200
BENZENE	6,200	470
TRICHLOROFLUOROMETHANE	7,100	650
O-XYLENE	15,000	--

VOCs	10/2000	1/27/04
ACROLEIN (PROPENAL)	--	12J

VOCs	10/30/00	1/30/04
1,1-DICHLOROETHANE	1700/1,600	1,400
1,1-DICHLOROETHENE	3,200/3,200	67
TETRACHLOROETHENE	<120	20
BENZENE	<120	10J
VINYL CHLORIDE	360/340	370
cis-1,2-DICHLOROETHENE	--	3,600
TRICHLOROETHENE	<120	22

VOCs	10/2000	1/27/04
BENZENE	--	18/<50
1,2,4-TRIMETHYLBENZENE	2,410	1,300/1,500
1,3,5-TRIMETHYLBENZENE	588	--/--

VOCs	10/2000	3/1/04
1,2,4-TRIMETHYLBENZENE	--	870
1,3,5-TRIMETHYLBENZENE	--	370
BENZENE	--	74

VOCs	10/2000	2/3/04
1,2,4-TRIMETHYLBENZENE	1,610	18/14
1,3,5-TRIMETHYLBENZENE	107	--/--
BENZENE	51.7	--/--

LEGEND

- E-29 SHALLOW GROUNDWATER ZONE MONITORING WELL LOCATION
- W-15 PERCHED GROUNDWATER ZONE MONITORING WELL LOCATION
- SB-F8 ARCADIS TEMPORARY MONITORING WELL/SOIL BORING LOCATION

NOTES

1. "J" INDICATES VALUE IS ESTIMATED.
2. CONCENTRATIONS ARE COMPARED TO PADEP ACT 2 USED AQUIFER, TDS< 2500, NON-RESIDENTIAL MSCs.
3. "X/X" INDICATES A DUPLICATE SAMPLE WAS COLLECTED AT THIS LOCATION.
4. "FP" INDICATES THAT LNAPL HAS BEEN DETECTED IN THE WELL.
5. "--" INDICATES PARAMETER WAS NOT ANALYZED OR IS BELOW THE MSC.
6. "NS" INDICATES THE WELL WAS NOT SAMPLED DUE TO THE PRESENCE OF LNAPL.
7. "NA" INDICATES WELL WAS NOT SAMPLED DUE TO ABANDONMENT OF WELL, OR CONVERSION TO PERMANENT WELL.

SCALE
0 180 360 FEET

REVISION	DATE	DESCRIPTION

FIGURE 15

GROUNDWATER VOC EXCEEDANCES (μg/l) PERCHED/SHALLOW UNCONSOLIDATED GROUNDWATER ZONE

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
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DRAWN BY: T.E. McKee DATE: 3-15-04
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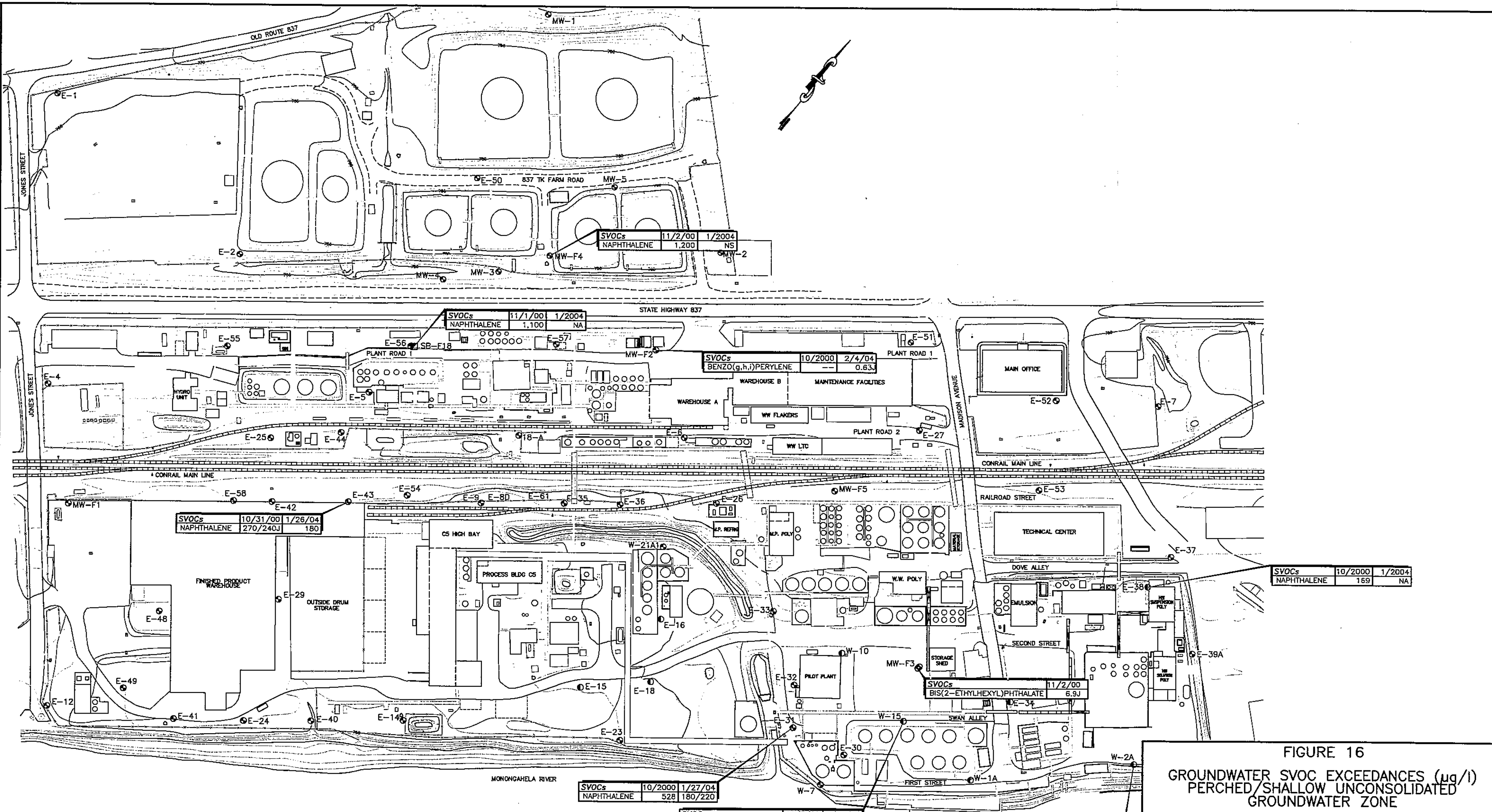
PLOT SCALE: 1=1



SVOCs	11/2/00	1/2004
NAPHTHALENE	1,200	NS

SVOCs	11/1/00	1/2004
NAPHTHALENE	1,100	NA

SVOCs	10/2000	2/4/04
BENZO(g,h,i)PERYLENE	--	0.63J

SVOCs	10/31/00	1/26/04
NAPHTHALENE	270/240J	180

SVOCs	10/2000	1/2004
NAPHTHALENE	159	NA

SVOCs	11/2/00	
BIS(2-ETHYLHEXYL)PHTHALATE	6.9J	

SVOCs	10/2000	1/27/04
NAPHTHALENE	528	180/220

SVOCs	11/3/00	1/29/04
DIBENZO(a,h)ANTHRACENE	--	0.99J
NAPHTHALENE	1,500	840
BENZO(a)PYRENE	--	0.98J
1,4-DIOXANE	--	26
BENZO(g,h,i)PERYLENE	--	1.1J

SVOCs	11/2/00	2/3/04
DIBENZO(a,h)ANTHRACENE	--	<10/2.1J
BENZO(a)PYRENE	--	<10/0.72J
BENZO(g,h,i)PERYLENE	--	<10/2.5J
PENTACHLOROPHENOL	--	<50/5.6J
NAPHTHALENE	750	--/--

LEGEND

- E-43 SHALLOW GROUNDWATER ZONE MONITORING WELL LOCATION
- W-2A PERCHED GROUNDWATER ZONE MONITORING WELL
- SB-F18 ARCADIS TEMPORARY MONITORING WELL

NOTES

1. "J" INDICATES VALUE IS ESTIMATED.
2. CONCENTRATIONS ARE COMPARED TO PADEP ACT 2 USED AQUIFER, TDS< 2500, NON-RESIDENTIAL MSCs.
3. "X/X" INDICATES A DUPLICATE SAMPLE WAS COLLECTED AT THIS LOCATION.
4. "NS" INDICATES WELL WAS NOT SAMPLED DUE TO THE PRESENCE OF LNAPL.
5. "NA" INDICATES WELL WAS NOT SAMPLED DUE TO ABANDONMENT OF WELL, OR CONVERSION TO PERMANENT WELL.
6. "--" INDICATES CONCENTRATION NOT DETECTED ABOVE METHOD DETECTION LIMITS.

SCALE
0 180 360 FEET

REVISION	DATE	DESCRIPTION

FIGURE 16

GROUNDWATER SVOC EXCEEDANCES (µg/l) PERCHED/SHALLOW UNCONSOLIDATED GROUNDWATER ZONE

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

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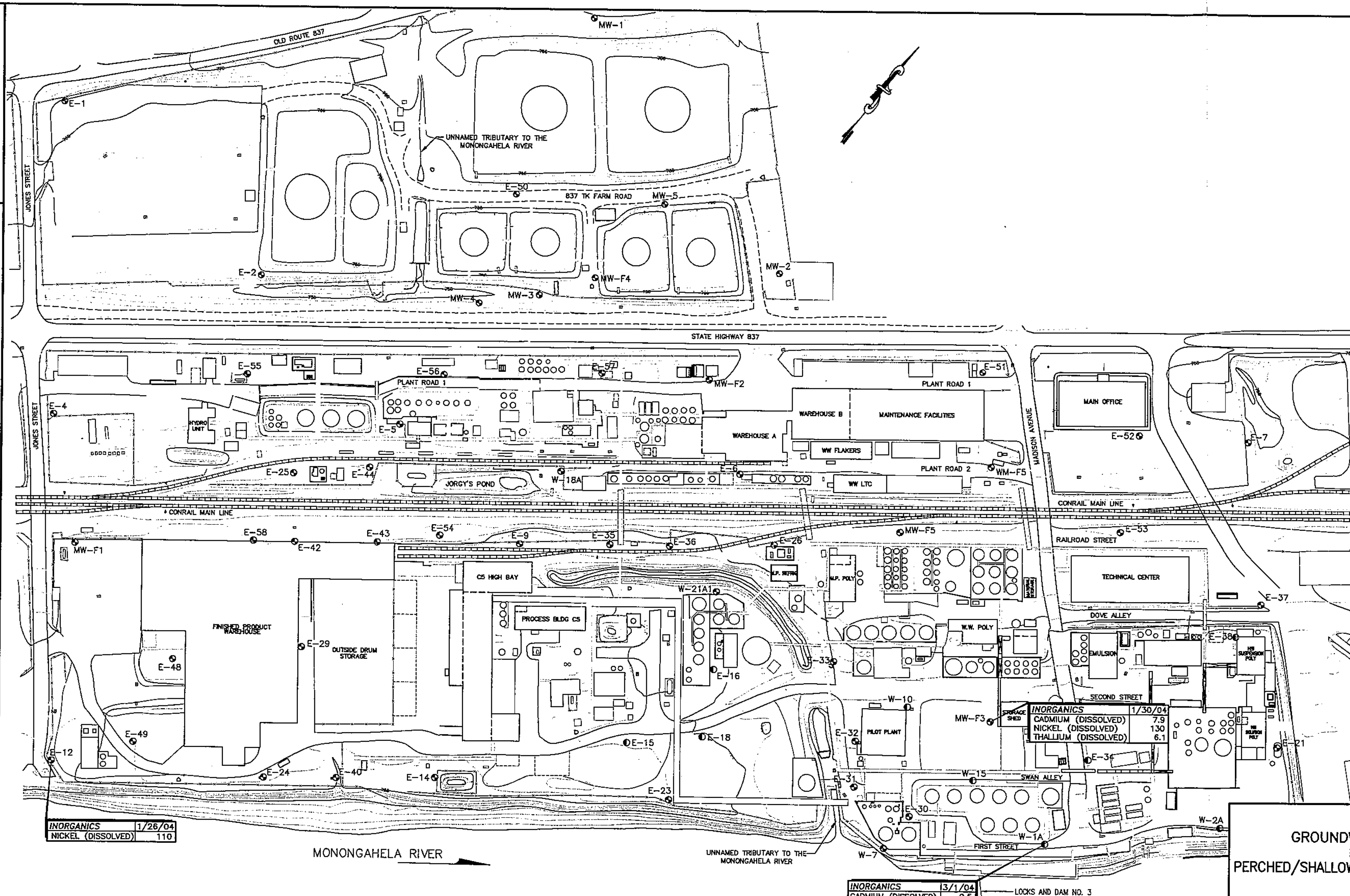
PLOT SCALE: 1=1



LEGEND

E-6 ⊗ SHALLOW MONITORING WELL LOCATION

E-38 ◐ PERCHED MONITORING WELL LOCATION

NOTES

1. CONCENTRATIONS ARE COMPARED TO PADEP ACT 2 USED AQUIFER, TDS< 2500, NON-RESIDENTIAL MSCs.

SCALE

0 180 360 FEET

REVISION	DATE	DESCRIPTION

FIGURE 17

GROUNDWATER DISSOLVED INORGANIC EXCEEDANCES (μg/l)
PERCHED/SHALLOW UNCONSOLIDATED GROUNDWATER ZONE

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B32

DRAWN BY: T.N. Fitzroy	DATE: 4-8-04
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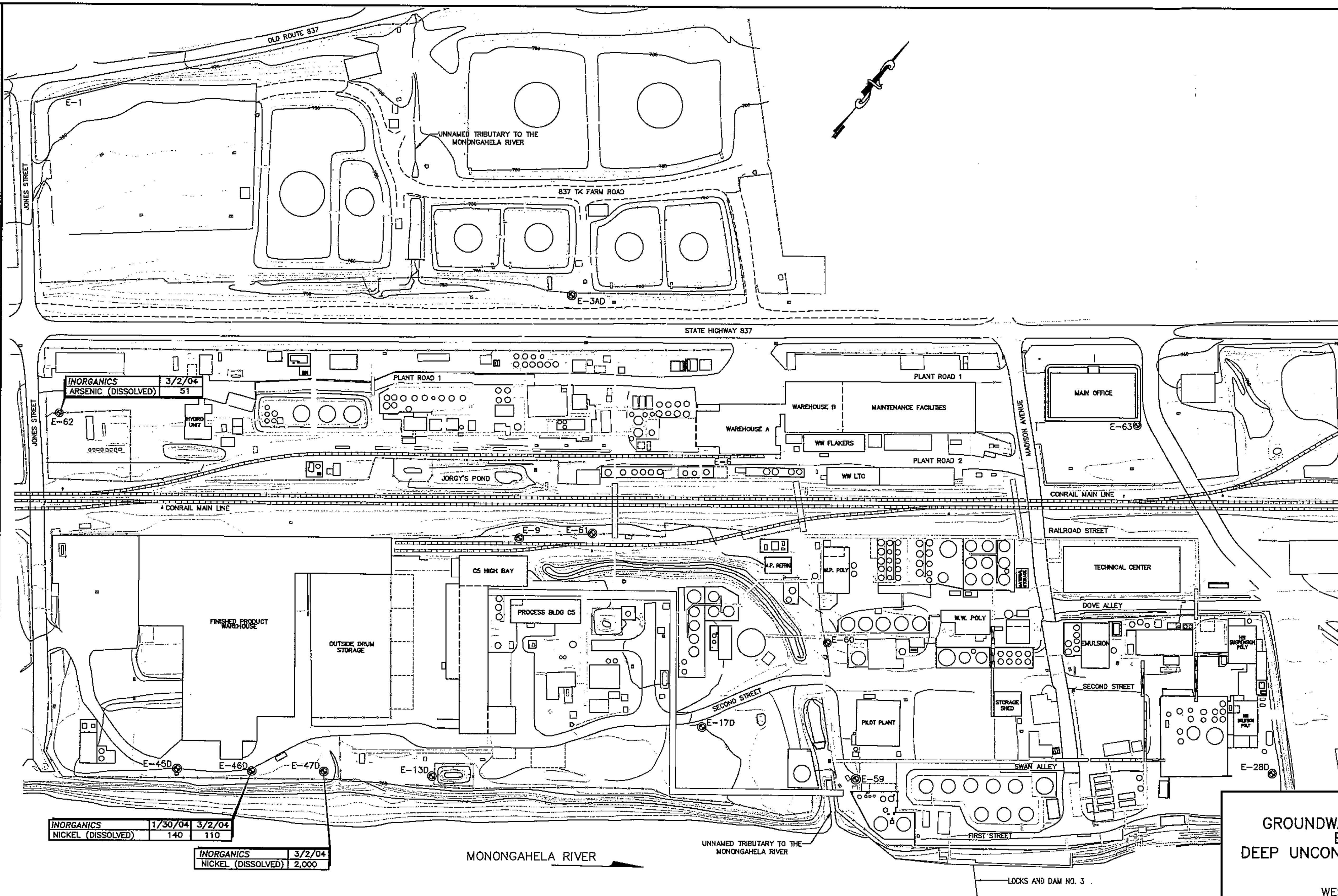
APPROVED BY: W.A. Baughman	DATE: 8-16-04

PLOT SCALE: 1=1



INORGANICS	3/2/04
ARSENIC (DISSOLVED)	51

INORGANICS	1/30/04	3/2/04
NICKEL (DISSOLVED)	140	110

INORGANICS	3/2/04
NICKEL (DISSOLVED)	2,000

LEGEND

E-28D ◎ DEEP MONITORING WELL LOCATION

NOTES

1. CONCENTRATIONS ARE COMPARED TO PADEP ACT 2 USED AQUIFER, TDS< 2500, NON-RESIDENTIAL MSCs.

SCALE 0 180 360 FEET

FIGURE 18

GROUNDWATER DISSOLVED INORGANIC EXCEEDANCES (µg/l) DEEP UNCONSOLIDATED GROUNDWATER ZONE

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B33

DRAWN BY:	T.E. McKee	DATE: 3-15-04
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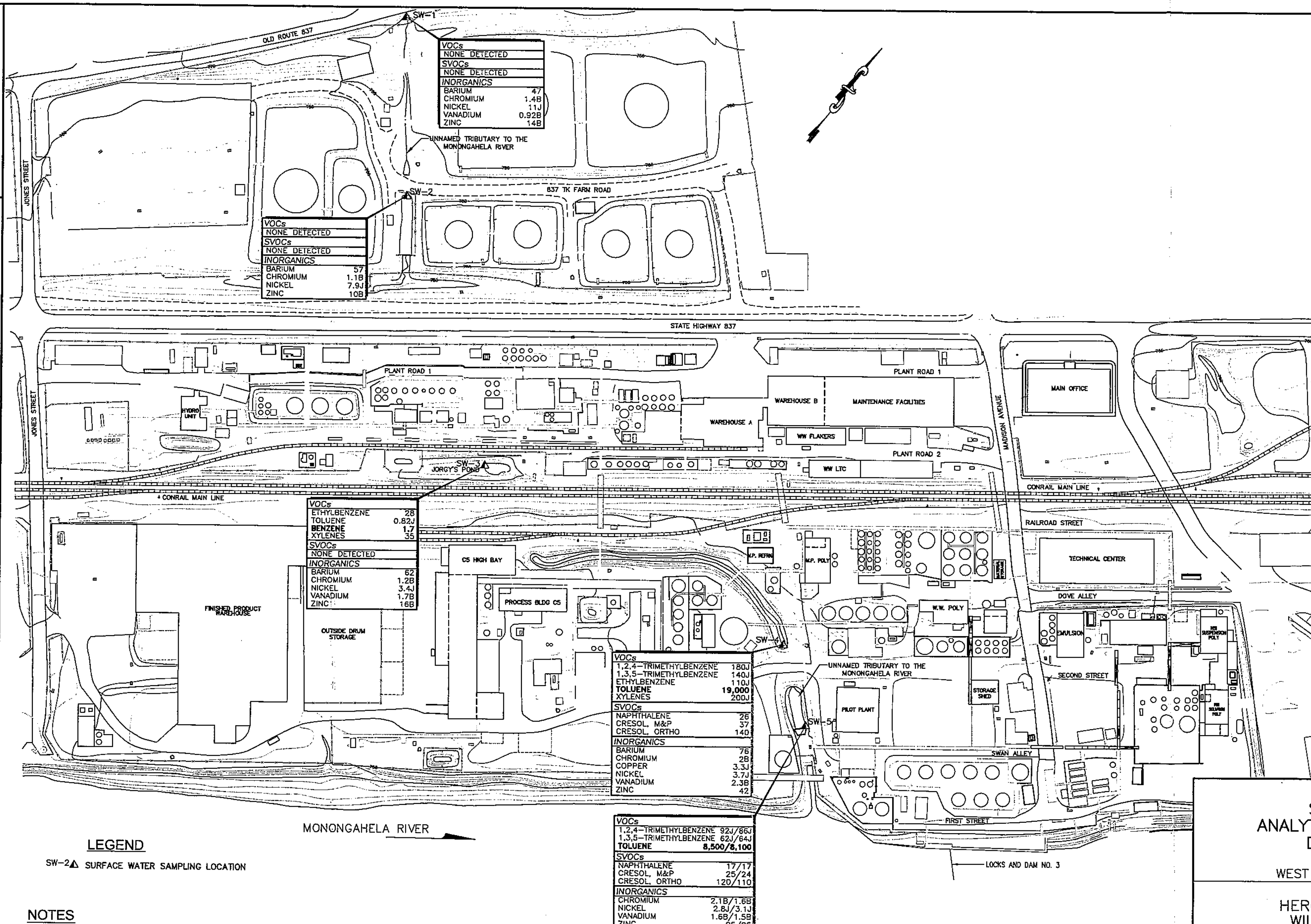
APPROVED BY:	W.A. Baughman	DATE: 8-16-04

REVISION	DATE	DESCRIPTION

PLOT SCALE: 1=1



LEGEND

SW-2△ SURFACE WATER SAMPLING LOCATION

NOTES

1. "J" INDICATES VALUE IS ESTIMATED.
2. "X/X" INDICATES A DUPLICATE SAMPLE WAS COLLECTED AT THIS LOCATION.
3. "B" INDICATES VALUE NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN THE LABORATORY OR FIELD BLANKS.
4. BOLD VALUES INDICATES EXCEEDANCE OF CHAPTER 16 SURFACE WATER CRITERIA.

PLOT SCALE: 1=1

SCALE
0 180 360 FEET

REVISION	DATE	DESCRIPTION

FIGURE 19
SURFACE WATER
ANALYTICAL RESULTS (μg/l)
DECEMBER 2003

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
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DRAWN BY: T.E. McKee	DATE: 3-15-04
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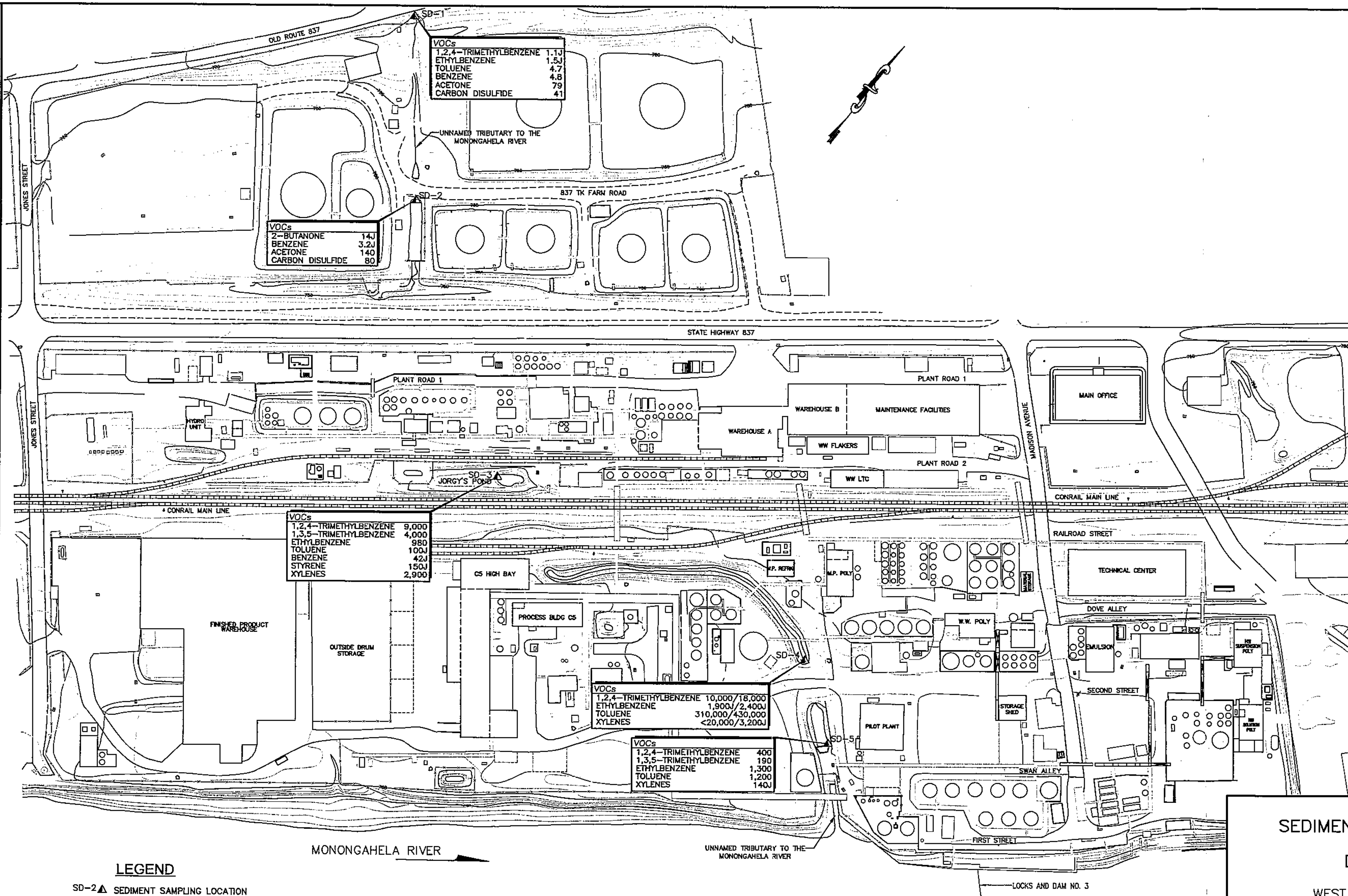


LEGEND

SD-2▲ SEDIMENT SAMPLING LOCATION

NOTES

1. "J" INDICATES VALUE IS ESTIMATED.
2. "X/X" INDICATES A DUPLICATE SAMPLE WAS COLLECTED AT THIS LOCATION.

SCALE
0 180 360 FEET

FIGURE 20
SEDIMENT ANALYTICAL RESULTS
VOCs (μg/kg)
DECEMBER 2003
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

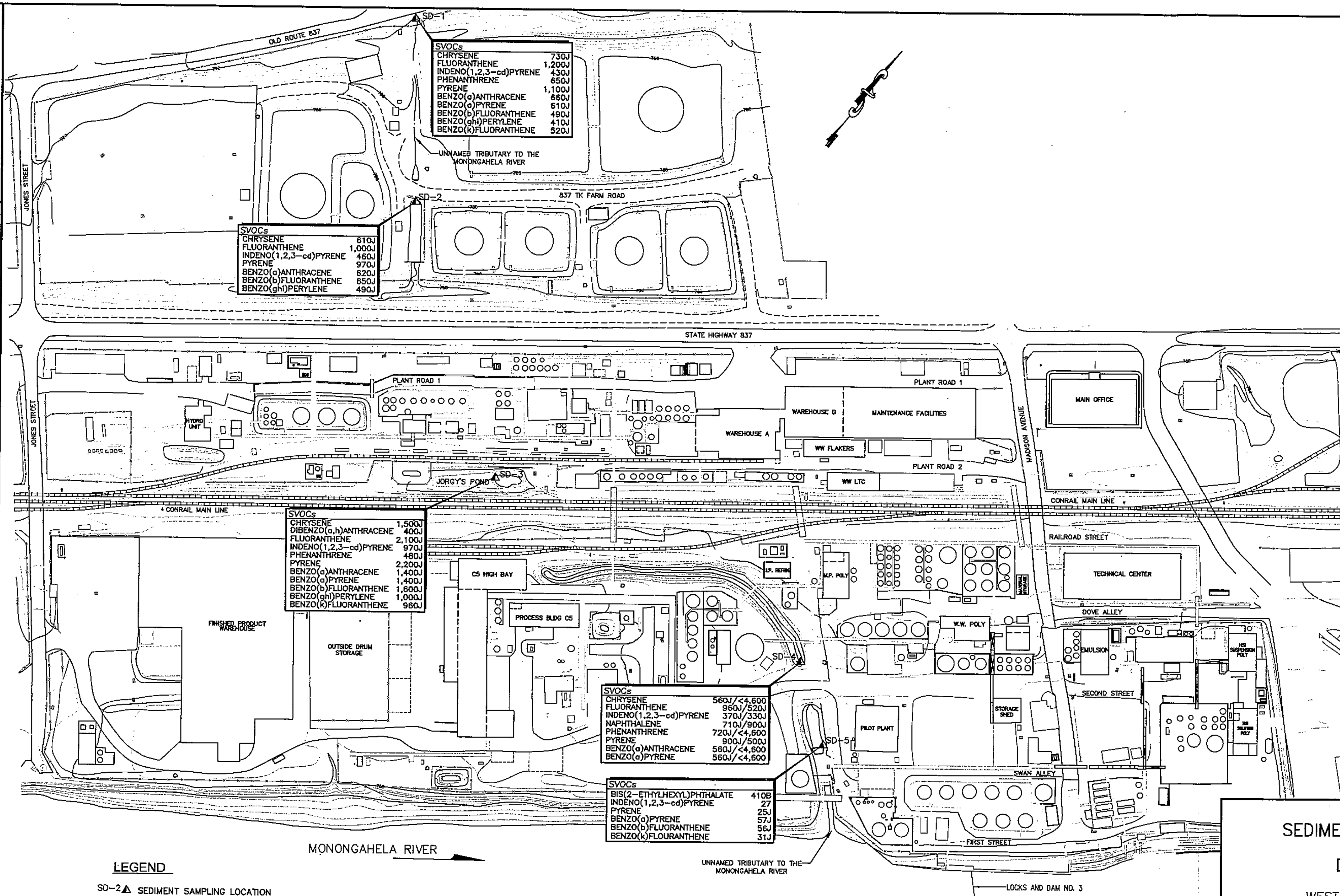
DRAWING NUMBER 01305B11

DRAWN BY: T.E. McKee — DATE: 3-15-04
CHECKED BY: M.J. Valentine — DATE: 8-16-04
APPROVED BY: W.A. Baughman — DATE: 8-16-04

REVISION	DATE	DESCRIPTION

DRAWING NUMBER 01305B11

PLOT SCALE: 1=1



DRAWING NUMBER 01305B14

LEGEND

SD-2▲ SEDIMENT SAMPLING LOCATION

NOTES

1. "J" INDICATES VALUE IS ESTIMATED.
2. "X/X" INDICATES A DUPLICATE SAMPLE WAS COLLECTED AT THIS LOCATION.
3. "B" INDICATES VALUE NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN THE LABORATORY OR FIELD BLANKS.

SCALE

0 180 360 FEET

PLOT SCALE: 1=1'

REVISION	DATE	DESCRIPTION

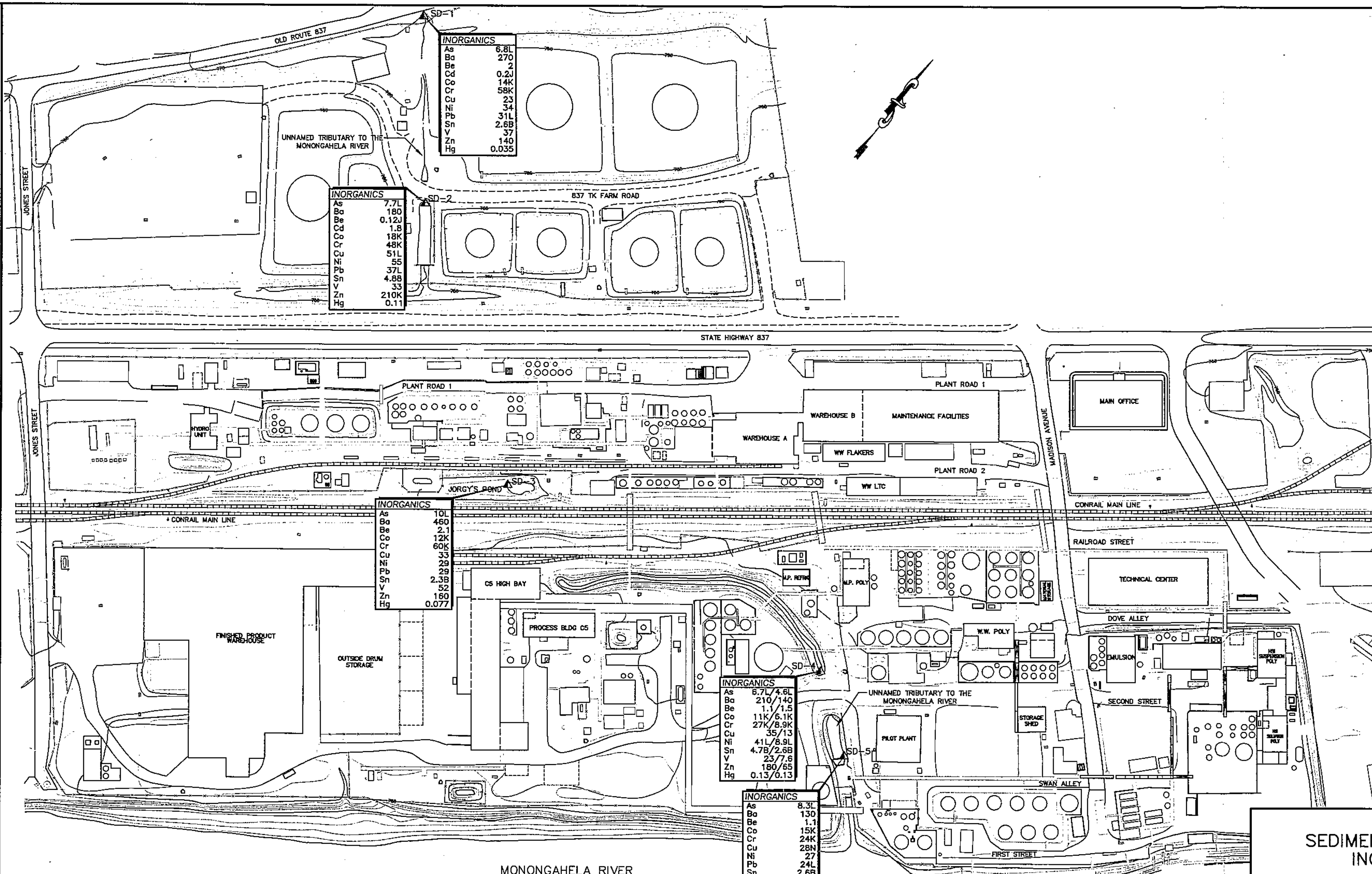
FIGURE 21
SEDIMENT ANALYTICAL RESULTS
SVOCs (µg/kg)
DECEMBER 2003
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B14

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04



DRAWING NUMBER 01305B10

LEGEND

SD-2▲ SEDIMENT SAMPLING LOCATION

NOTES

1. "J" INDICATES VALUE IS ESTIMATED
2. "B" INDICATES VALUE NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.
3. "X/X" INDICATES A DUPLICATE SAMPLE WAS COLLECTED AT THIS LOCATION
4. "L" INDICATES REPORTED VALUE MAY BE BIASED LOW
5. "K" INDICATES REPORTED VALUE MAY BE BIASED HIGH.
6. INORGANIC ABBREVIATIONS
   As=ARSENIC Cu=COPPER
   Ba=BARIUM Ni=NICKEL
   Be=BERYLLIUM Pb=LEAD
   Cd=CADMIUM Sn=TIN
   Co=COBALT V=VANADIUM
   Cr=CHROMIUM Zn=ZINC
   Hg=MERCURY

SCALE

0 180 360 FEET

PLOT SCALE: 1=1

REVISION	DATE	DESCRIPTION

FIGURE 22
SEDIMENT ANALYTICAL RESULTS INORGANICS (mg/kg) DECEMBER 2003

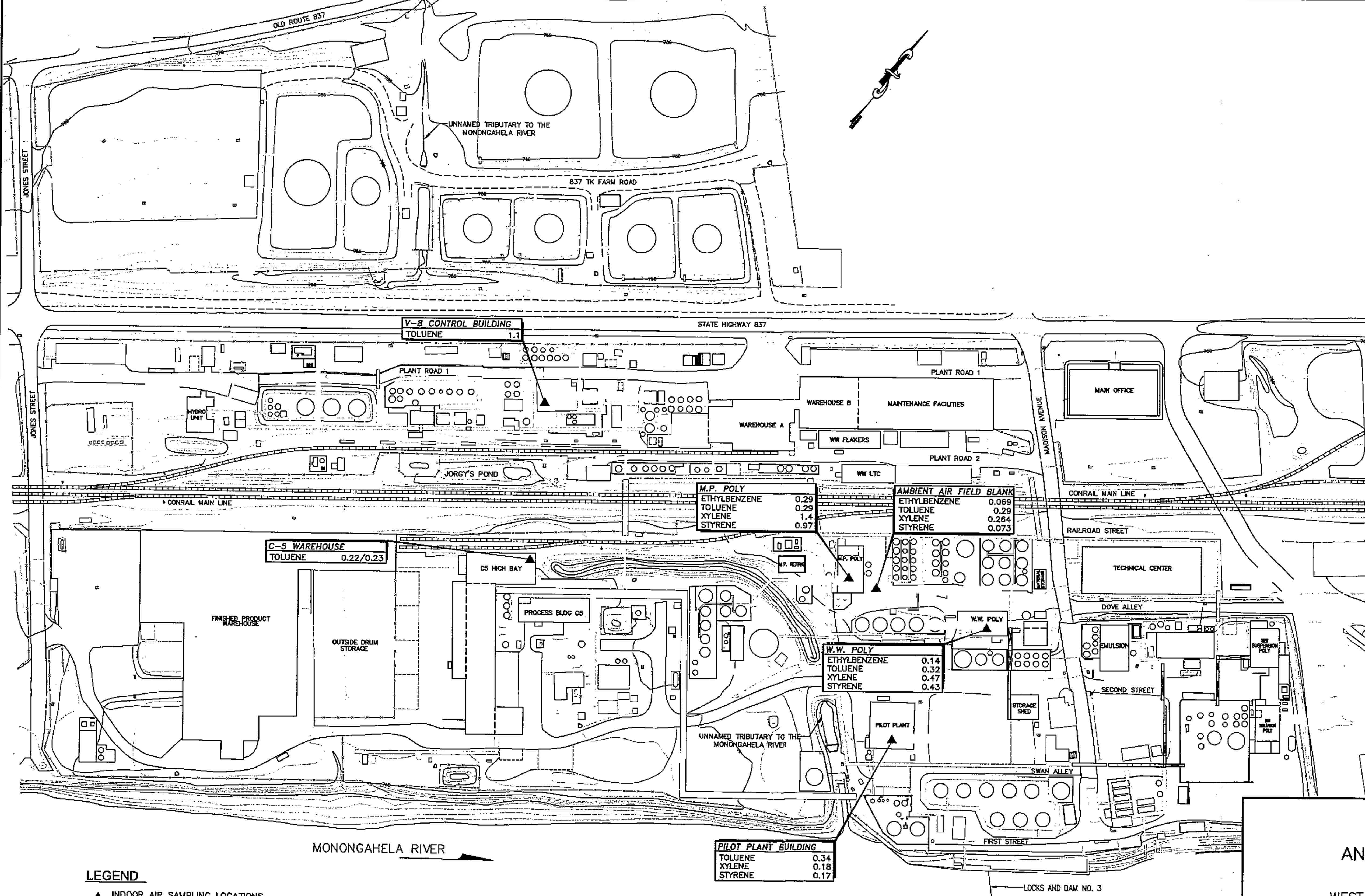
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B10

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04



DRAWING NUMBER 01305B15

LEGEND

▲ INDOOR AIR SAMPLING LOCATIONS

NOTES

1. CONCENTRATIONS ARE IN MILLIGRAMS PER CUBIC METER (mg/m^3)
2. ONLY DETECTED CONCENTRATIONS WERE USED FOR THE CONSTRUCTION OF THIS DRAWING.

SCALE

0 180 360 FEET

PLOT SCALE: 1=1

REVISION	DATE	DESCRIPTION

FIGURE 23
INDOOR AIR ANALYTICAL RESULTS

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

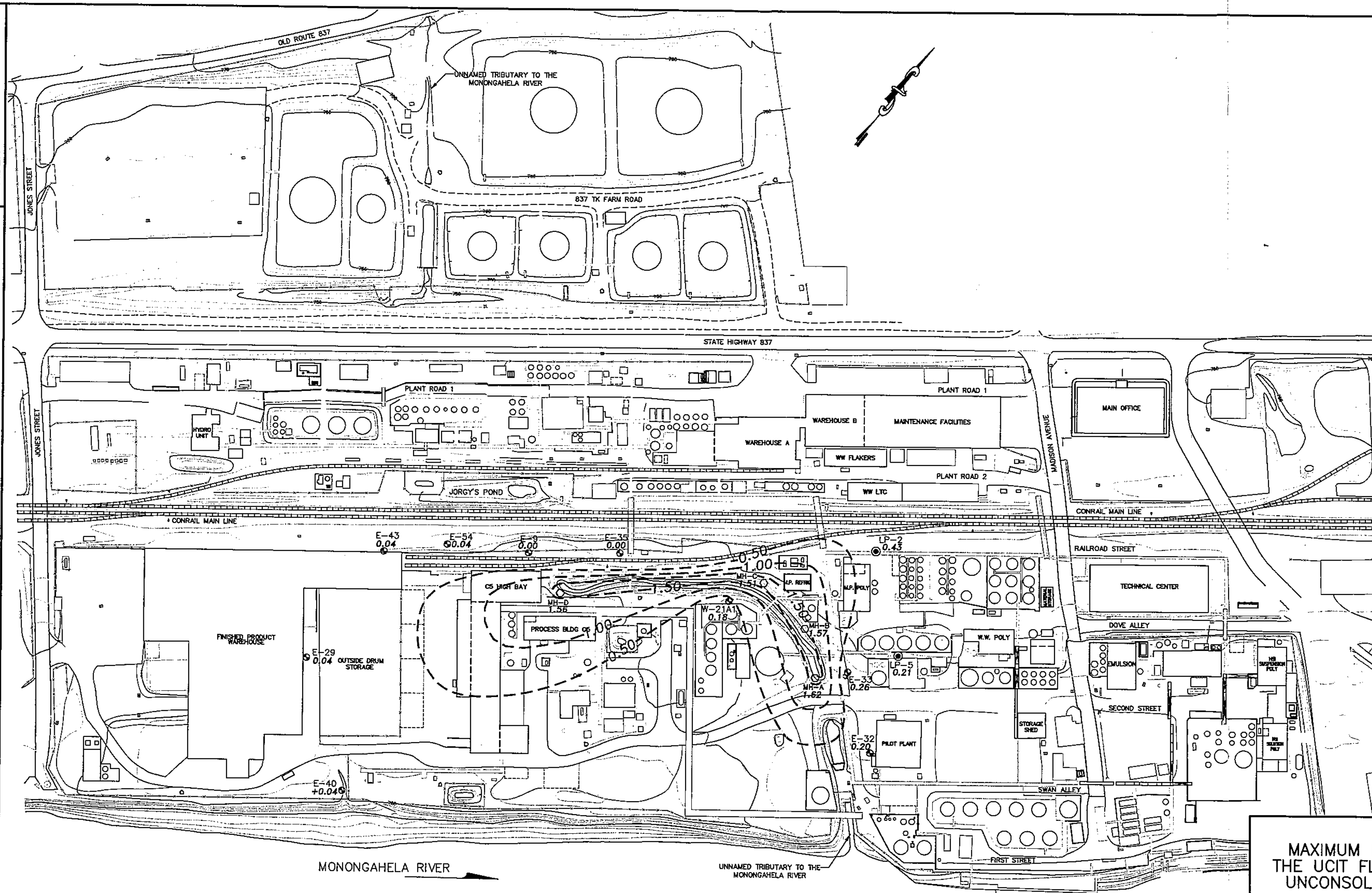
PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01305B15

DRAWN BY: T.E. McKee	DATE: 3-15-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

DRAWING NUMBER 01305B30



LEGEND

- E-6 SHALLOW MONITORING WELL LOCATION
- LP-2 PIEZOMETER LOCATION
- MH-D UNDER CREEK INTERCEPTOR TRENCH MANHOLE LOCATION
- — — — MAXIMUM DRAWDOWN CONTOUR (FEET)
- *0.20* MAXIMUM DRAWDOWN (FEET)

NOTES

1. CONTOURS ARE BASED UPON INTERPRETATION OF DATA. ACTUAL SUBSURFACE CONDITIONS BETWEEN DATA POINTS MAY DIFFER DUE TO HYDROGEOLOGIC CONDITIONS.

SCALE

0 180 360 FEET

PLOT SCALE: 1=1

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MATTHEW J. VALENTINE
GEOLOGIST
No. PG-000820-G

Matt J. Valentine 8-16-04

REVISION	DATE	DESCRIPTION

FIGURE 24

MAXIMUM DRAWDOWN IN FEET DURING THE UCIT FLOW ASSESSMENT – SHALLOW UNCONSOLIDATED GROUNDWATER ZONE

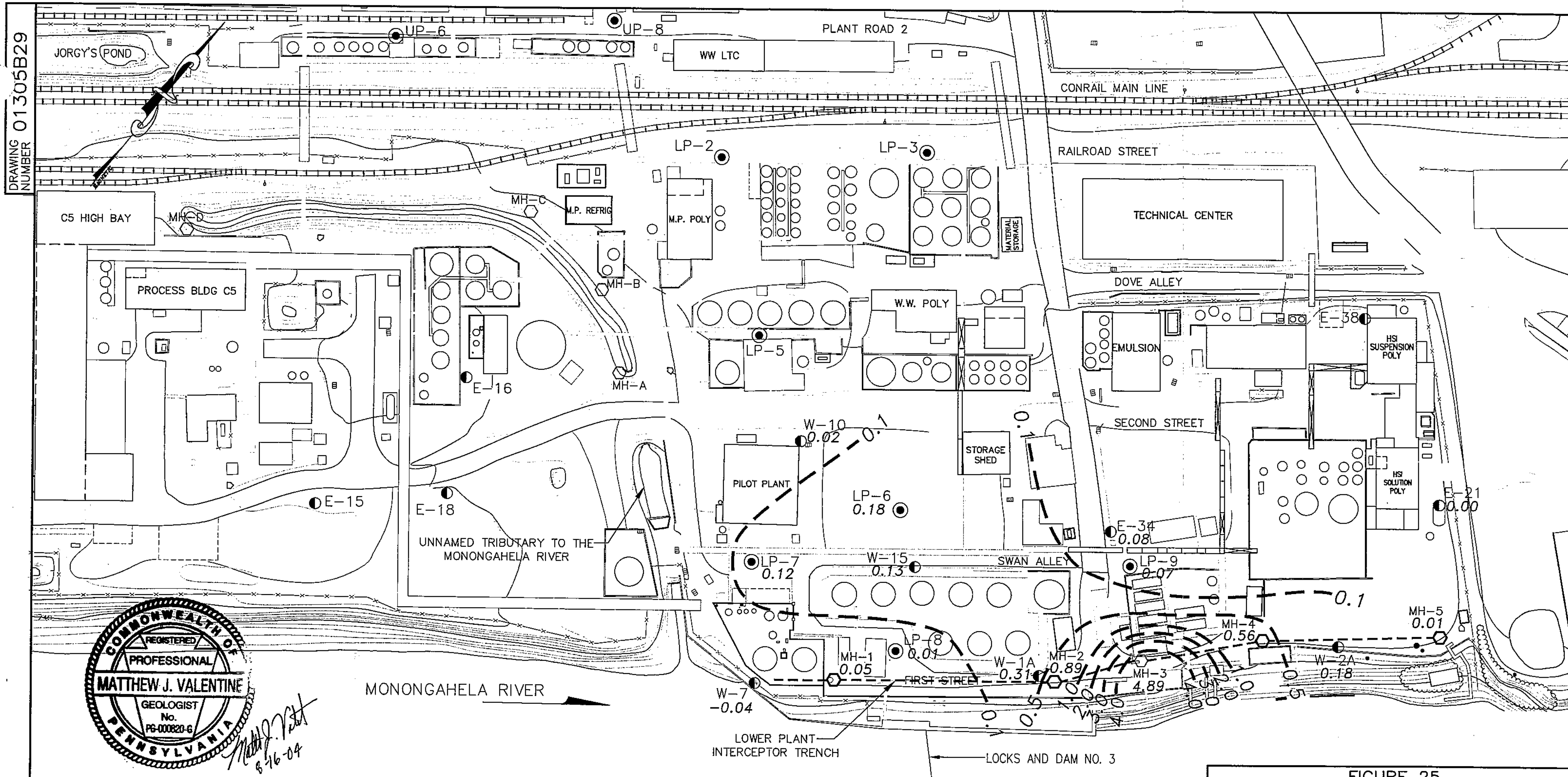
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B30

DRAWN BY: T.E. McKee	DATE: 4-2-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04



LEGEND

E-38 ◐	PERCHED MONITORING WELL LOCATION
LP-6 ◉	PIEZOMETER LOCATION
MH-1 ⬡	LOWER PLANT INTERCEPTOR TRENCH MANHOLE LOCATION
— — —	MAXIMUM DRAWDOWN CONTOUR (FEET)
0.01	MAXIMUM DRAWDOWN (FEET)

NOTE

1. CONTOURS ARE BASED UPON INTERPRETATION OF DATA. ACTUAL SUBSURFACE CONDITIONS BETWEEN DATA POINTS MAY DIFFER DUE TO HYDROGEOLOGIC CONDITIONS.

SCALE
0 100 200 FEET

FIGURE 25
MAXIMUM DRAWDOWN IN FEET DURING THE LPIT FLOW ASSESSMENT PERCHED GROUNDWATER ZONE

JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

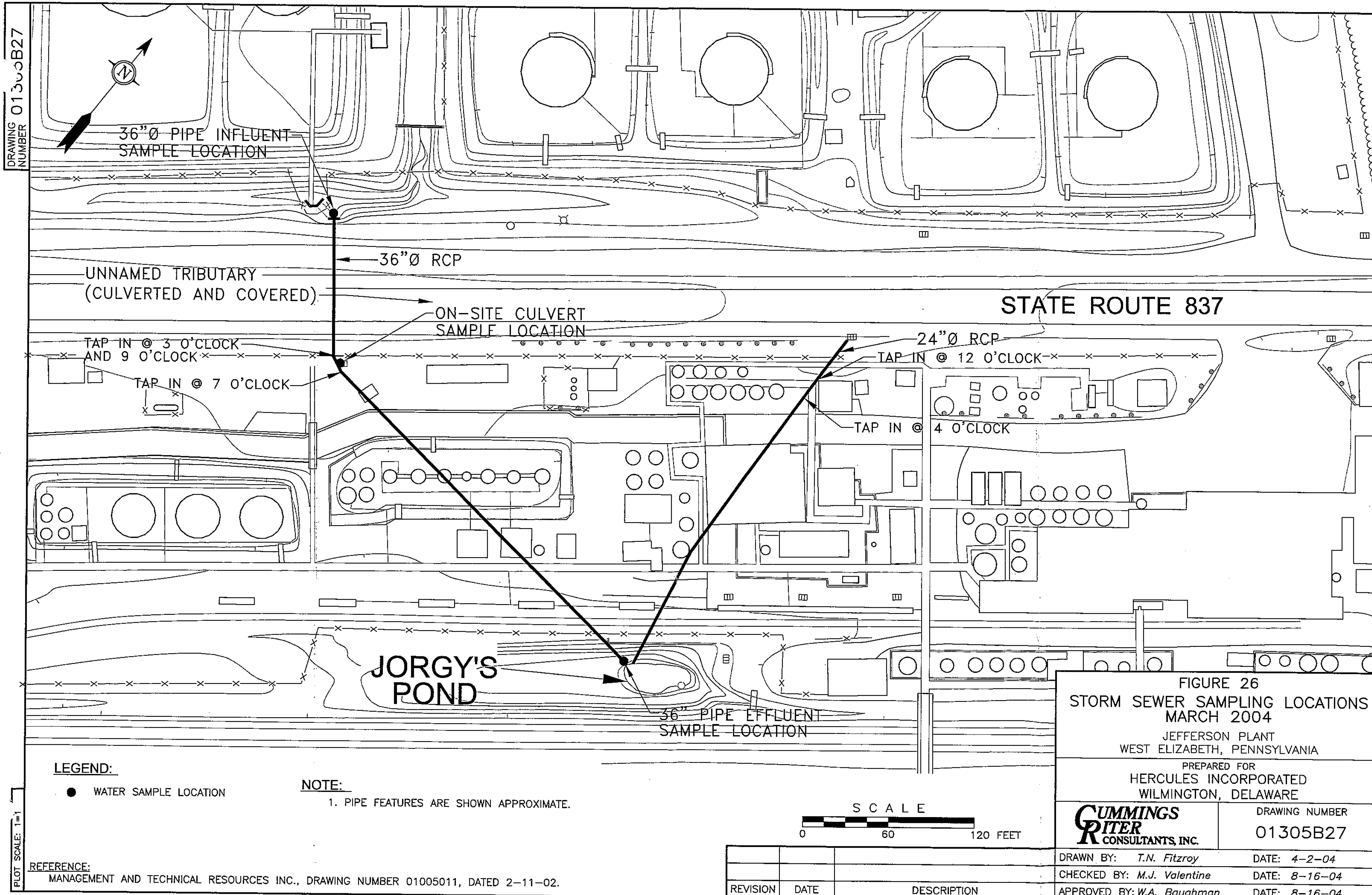
CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B29

REVISION	DATE	DESCRIPTION

DRAWN BY: T.E. McKee	DATE: 4-2-04
CHECKED BY: M.J. Valentine	DATE: 8-16-04
APPROVED BY: W.A. Baughman	DATE: 8-16-04

PLOT SCALE: 1=1


DRAWING NUMBER 01305B27
36"Ø PIPE INFLUENT SAMPLE LOCATION
36"Ø RCP
UNNAMED TRIBUTARY (CULVERTED AND COVERED)
ON-SITE CULVERT SAMPLE LOCATION
STATE ROUTE 837
TAP IN @ 3 O'CLOCK AND 9 O'CLOCK
TAP IN @ 7 O'CLOCK
24"Ø RCP
TAP IN @ 12 O'CLOCK
TAP IN @ 4 O'CLOCK
JORGY'S POND
36" PIPE EFFLUENT SAMPLE LOCATION
LEGEND:
WATER SAMPLE LOCATION
NOTE:
1. PIPE FEATURES ARE SHOWN APPROXIMATE.
SCALE
0 60 120 FEET
PLOT SCALE: 1=1
REFERENCE:
MANAGEMENT AND TECHNICAL RESOURCES INC., DRAWING NUMBER 01005011, DATED 2-11-02.
REVISION DATE DESCRIPTION
FIGURE 26
STORM SEWER SAMPLING LOCATIONS
MARCH 2004
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA
PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE
CUMMINGS RITER CONSULTANTS, INC.
DRAWING NUMBER
01305B27
DRAWN BY: T.N. Fitzroy DATE: 4-2-04
CHECKED BY: M.J. Valentine DATE: 8-16-04
APPROVED BY: W.A. Baughman DATE: 8-16-04

APPENDIX A

BORING LOGS/WELL INSTALLATION DETAILS

CUMMINGS RITER

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. C-1

Client: HERCULES, INC.	Project No. 01305.40		
Site Name: JEFFERSON PLANT	Date Started: 12-3-03		
Location: WEST ELIZABETH, PA	Date Completed: 12-3-03		
...ing Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 19.5 FT. BGS	
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-3-03 / 15:00	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4742.93 E 4488.09

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0				VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 1.2'	0.0	C-1 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-1	3.1		STIFF, BROWN, CLAYEY SILT, TRACE GRAVEL, MOIST	0.0	
5					-	
	S-2	0.0		8.0'	-	
				SOFT, DARK GRAY, CLAYEY SILT, TRACE GRAVEL, MOIST	0.0	
10	S-3	3.7		12.0'	0.0	
				SOFT, DARK GRAY, SANDY SILT, MOIST	0.0	
15	S-4	3.4			0.0	
					512	C-1 (17.5' - 19.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-5	4.0		WATER ENCOUNTERED AT 19.5 FT BGS 19.5'	501	
20				VERY SOFT, DARK GRAY, CLAYEY SILT, WET 20.0'		

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. C-2

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-3-03
Location: WEST ELIZABETH, PA
Date Completed: 12-3-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 16.0 FT. BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-3-03 / 13:25
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4644.26 E 4414.68
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	3.2		MEDIUM DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 1.1'	0.0	C-2 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				MEDIUM STIFF, BROWN AND ORANGE, CLAYEY SILT, TRACE GRAVEL, DRY 4.0'	0.0	
5	S-2	2.7		LOOSE, OLIVE GREEN TO BLACK, SAND AND GRAVEL, MOIST	2.6	
				8.3'	0.0	
10	S-3	3.5		MEDIUM STIFF, REDDISH BROWN, SANDY SILT, TRACE GRAVEL, DRY 10.6'	0.0	
				LOOSE, REDDISH BROWN, MEDIUM GRAINED SAND, MOIST 12.5'	0.0	
	S-4	4.0		MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, MOIST	0.0	
15				WATER ENCOUNTERED AT 16.0 FT. BGS. 16.0'	0.0	
	S-5	2.1		VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 16.3'	0.0	C-2 (14.0' - 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				SOFT, REDDISH BROWN, SANDY SILT, MOIST 20.0'	0.0	
20				*BOTTOM OF BORING AT 20.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
35						
40						

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. C-3

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-3-03
Location: WEST ELIZABETH, PA
Date Completed: 12-3-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 16.0 FT. BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-3-03 / 11:52
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4505.12 E 4256.70
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	3.9		MEDIUM DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 1.1'	0.0	C-3 (0.0 - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, DRY 4.0'	0.0	
5	S-2	3.6		STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY	0.0	
					0.0	
10	S-3	4.0			0.0	
				12.9'	0.0	
	S-4	4.0		MEDIUM STIFF, BROWN, SANDY SILT, MOIST	0.0	
15				WATER ENCOUNTERED AT 16.0 FT. BGS. 16.0'	0.0	
	S-5	2.9		VERY SOFT, BROWN, SANDY SILT, WET 16.9'	0.0	C-3 (14.0' - 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				LOOSE, BROWN, SILTY SAND, MOIST 20.0'	0.0	
20				*BOTTOM OF BORING AT 20.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
40						

LOG OF BORING NO. C-4

CUMMINGS RITER CONSULTANTS, INC.

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-2-03
Location: WEST ELIZABETH, PA	Date Completed: 12-2-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 16.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-2-03 / 16:10

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4481.33 E 4192.88

Surface Elev. ______

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	3.1		VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY (1.2')	0.0	C-4 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				VERY STIFF, BROWN, CLAY SILT WITH TRACE GRAVEL, DRY (4.0')	0.0	
5	S-2	4.0		MEDIUM STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, MOIST	0.0	
					0.0	
10	S-3	4.0		(11.1')	0.0	
				SOFT, BROWN, SANDY SILT, MOIST	0.0	
15	S-4	4.0			0.0	
				WATER ENCOUNTERED AT 16.0 FT. BGS. (16.0')	0.0	
	S-5	0.2		VERY SOFT, BROWN, SANDY SILT, WET	0.0	C-4 (14.0' - 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
20				(20.0')	-	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. C-5

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 11-24-03
Location: WEST ELIZABETH, PA	Date Completed: 11-24-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK
Depth to GW:	
Driller: BRYAN HOBSON	Checked By: CLN
Date/Time: 11-24-03 / 11:35	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4154.31 E 4194.14
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	1.8		VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 2.0'	0.0	C-5 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				BOTTOM OF BORING AT 2.0' BORING BACKFILLED WITH BENTONITE CHIPS		
5						
10						
15						
20						
25						
30						
40						

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. C-6

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-2-03
Location: WEST ELIZABETH, PA
Date Completed: 12-2-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 15.5 FT. BGS
Driller: BRYAN HOBSON
Checked By: CLN
Date/Time: 12-2-03 / 14:50
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4342.25 E 4414.37
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–1.1	S-1	3.8	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY (1.1')	0.0	C-6 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
1.1–8.0			STIFF, BROWN, CLAYEY SILT, GRAVEL, DRY (8.0')	0.0	
	S-2	3.7		0.0	
				0.0	
8.0–9.2	S-3	3.8	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOIST (9.2')	0.0	
9.2–12.5			LOOSE, DARK BROWN, SILTY SAND, MOIST (12.5')	0.0	
12.5–15.5	S-4	3.9	LOOSE, BLACK, CLAYEY SAND, TRACE COAL, MOIST; WATER ENCOUNTERED AT 15.5 FT BGS (15.5')	0.0	C-6 (13.5' - 15.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
15.5–16.0			VERY LOOSE, BLACK, CLAYEY SAND, TRACE COAL, WET (16.0')	0.0	

BOTTOM OF BORING AT 16.0'
BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. C-7

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 11-24-03
Location: WEST ELIZABETH, PA	Date Completed: 11-24-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW:
Driller: BRYAN HOBSON / Checked By: CLN	Date/Time: 11-24-03 / 11:18

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4497.59 E 4567.79
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	2.0		VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 2.0'	0.0	C-7 (0.0' – 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				BOTTOM OF BORING AT 2.0' BORING BACKFILLED WITH BENTONITE CHIPS		
5						
10						
15						
20						
25						
30						
40						

CUMMINGS RITER CONSULTANTS, INC.

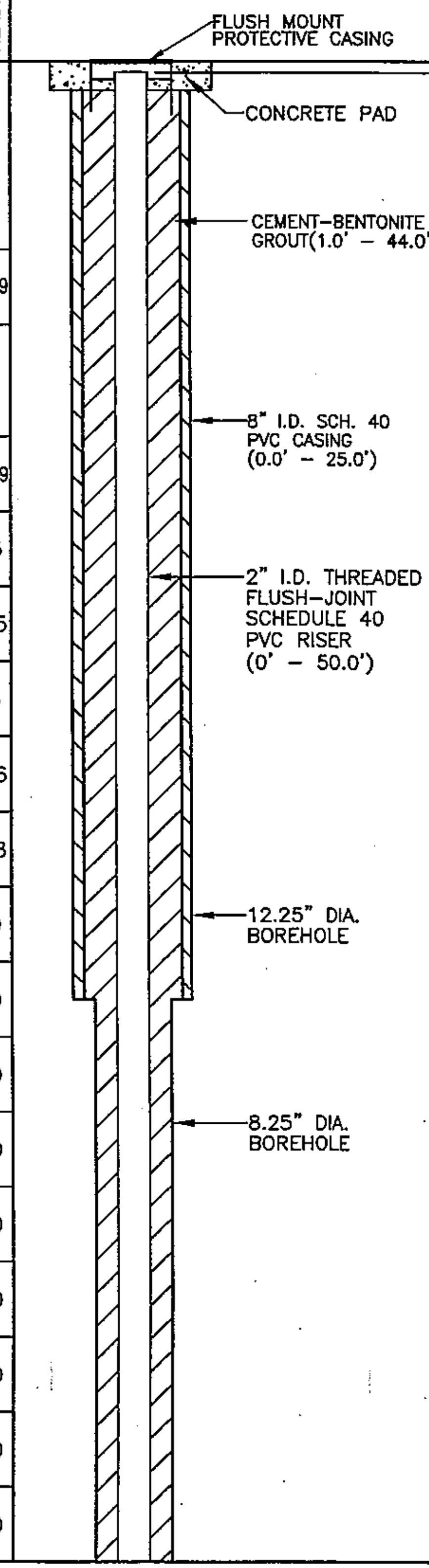
LOG OF BORING NO. E-59

Client: HERCULES INC. | Project No. 01305.40
Site Name: JEFFERSON PLANT | Date Started: 12-29-03
Location: WEST ELIZABETH, PA | Date Completed: 1-5-04
Drilling Co. CHATFIELD DRILLING | Field Geologist: CGK | Depth to GW: 10 FT BGS.
Driller: AARON HUGHES | Checked By: CLN | Date/Time: 1-5-04
Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,666.72 E 4,833.57
Surface Elev. 741.22'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
0				STIFF, GRAY TO BROWN, FILL MATERIAL, MOIST 5.0'		741.22 / 740.84
5	S-1	0.8	6-8 7-7	MEDIUM DENSE, LIGHT BROWN TO BLACK, SAND AND GRAVEL, WET	>9999	
				10.0'	-	
10	S-2	0.5	WOH-WOH WOH-WOH	VERY SOFT, BLACK, SANDY CLAY, WET WATER ENCOUNTERED AT 10.0 FT BGS 12.4'	>9999	730.00
	S-3	2.0	WOH-WOH WOH-WOH	SOFT, DARK GRAY, SILTY CLAY, TRACE SAND, MOIST	165	
15	S-4	2.0	WOH-WOH WOH-WOH	16.0'	24.5	
	S-5	2.0	WOH-WOH WOH-WOH	SOFT, DARK BROWN, SILTY CLAY, TRACE SAND, DRY	2.5	
	S-6	2.0	WOH-WOH 1-3	18.8' SOFT, DARK BROWN, SILTY CLAY, TRACE SAND AND GRAVEL, DRY 20.2'	20.6	
20	S-7	1.2	1-1 2-3	MEDUIM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOTTLED, DRY	14.8	720.00
	S-8	1.3	2-2 3-2	24.0'	0.0	
25	S-9	0.9	1-2 2-3	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOIST 26.2'	0.0	
	S-10	1.4	2-4 6-6	SOFT, LIGHT GRAY, SILTY CLAY, MOIST 26.9' LOOSE TO DENSE, REDDISH BROWN, SAND AND GRAVEL, SOME CLAY, DRY	0.0	
	S-11	1.5	16-18 18-19		0.0	
30	S-12	1.6	3-4 7-7		0.0	710.00
	S-13	1.7	2-3 3-5	33.5' MEDIUM STIFF, GRAY, SANDY CLAY, MOIST 34.0'	0.0	
35	S-14	2.0	3-5 5-6	LOOSE, GRAY, FINE GRAINED SAND, TRACE SILT, MOIST 36.5	0.0	
	S-15	1.1	3-4 4-6	LOOSE, REDDISH BROWN AND GRAY, SILTY SAND, MOIST	0.0	
40	S-16	1.2	2-3 5-5		0.0	700.00

WELL INSTALLATION DETAIL



CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. E-59

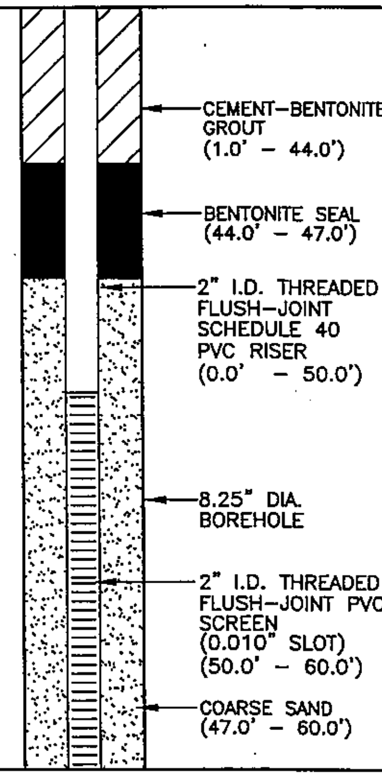
Client: HERCULES INC.	Project No. 01305.40		
Site Name: JEFFERSON PLANT	Date Started: 12-29-03		
Location: WEST ELIZABETH, PA	Date Completed: 1-5-04		
...ing Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 10 FT BGS.	
Driller: AARON HUGHES	Checked By: CLN	Date/Time: 1-5-04	

Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,666.72 E 4,833.57
Surface Elev. 741.22'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
40	S-17	1.7	4-4 12-20	LOOSE TO MEDIUM DENSE, REDDISH BROWN, SILTY SAND, MOIST	0.0	
	S-18	0.7	4-5 8-11	44.3'	0.0	
45	S-19	1.4	4-5 8-7	LOOSE, REDDISH BROWN, CLAYEY SAND, TRACE GRAVEL, MOIST	0.0	
	S-20	1.6	8-9 12-16		0.0	
	S-21	1.8	8-8 15-17		0.0	690.00
50	S-22	1.8	8-12 16-25	51.4'	0.0	
	S-23	1.6	WOH-5 8-7	LOOSE TO MEDIUM DENSE, BROWN SILTY SAND, SOME GRAVEL, MOIST 54.0'	0.0	
55	S-24	1.5	12-25 27-33	DENSE, BROWN, SILTY SAND, SOME GRAVEL, MOIST	0.0	
	S-25	1.4	12-12 14-50	57.1' HARD, YELLOWISH BROWN, SILTY CLAY, DRY 58.5'	0.0	
	S-26	0.7	48 50/1	HARD, GRAY, SANDSTONE, WEATHERED, DRY	0.0	
60				*BOTTOM OF BORING AT 60.0'* WELL E-59 INSTALLED WITH SCREEN SET FROM 50.0'-60.0' BGS		681.22
65						
70						
80						

WELL INSTALLATION DETAIL



REMARKS
WOH = WEIGHT OF HAMMER

CUMMINGS RITER CONSULTANTS, INC.

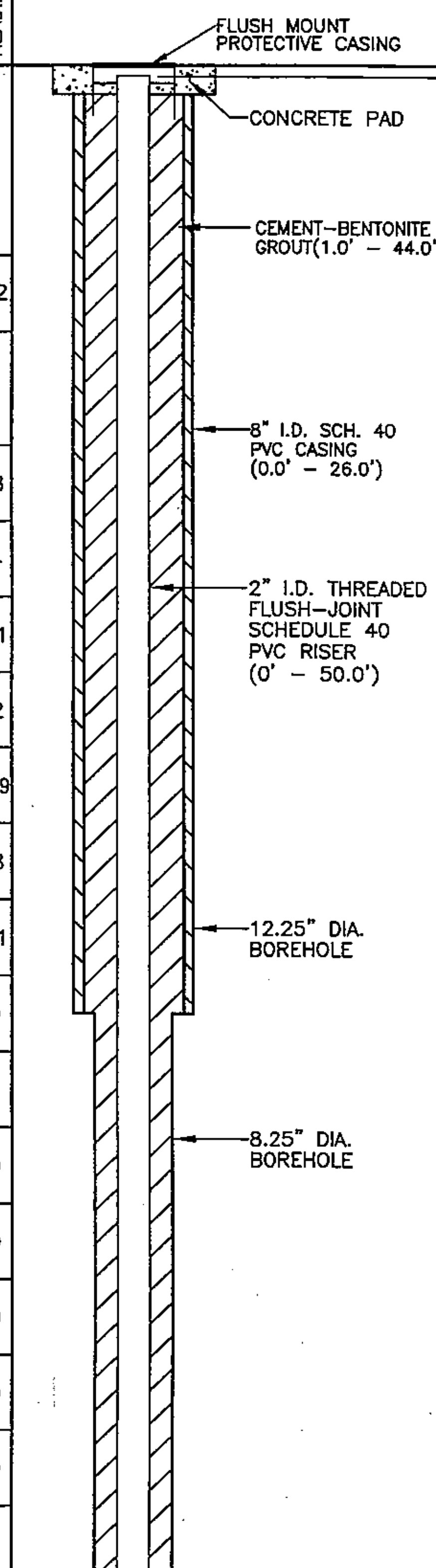
LOG OF BORING NO. E-60

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-30-03
Location: WEST ELIZABETH, PA
Date Completed: 1-6-04
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 16 FT BGS.
Driller: AARON HUGHES
Checked By: CLN
Date/Time: 1-6-04
Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,823.47 E 4,641.74
Surface Elev. 746.60'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)
0–5				VERY STIFF, GRAY TO BLACK, FILL MATERIAL, DRY 5.0'	
5–7	S-1	1.1	WOH-WOH WOH-1	LOOSE, GRAY TO BLACK, FILL MATERIAL, MOIST	76.2
7–10				10.0'	–
10–12	S-2	1.9	2-3 3-5	MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOTTLED, DRY	298
12–14	S-3	2.0	8-8 7-9	14.2'	214
14–16	S-4	1.8	2-4 4-6	MEDIUM STIFF, BROWN, SANDY SILT, MOIST WATER ENCOUNTERED AT 16.0 FT. BGS. 16.0'	95.1
16–18	S-5	1.8	4-6 6-6	VERY SOFT, LIGHT GRAY AND BROWN, SANDY SILT, WET	992
18–20	S-6	2.0	1-2 4-4	19.0' SOFT TO MEDIUM STIFF, REDDISH BROWN, SANDY CLAY, MOIST	>9999
20–22	S-7	1.9	1-1 2-3		838
22–24	S-8	1.7	2-3 2-2	24.0'	26.1
24–26	S-9	1.7	2-2 2-3	MEDIUM STIFF, REDDISH BROWN, SANDY CLAY, DRY	0.0
26–28	–	–	–	28.0'	–
28–30	S-10	1.8	1-1 2-3	VERY LOOSE, REDDISH BROWN, CLAYEY SAND, MOIST	0.0
30–32	S-11	1.2	1-3 5-5	31.9'	0.0
32–34	S-12	1.7	1-2 3-3	LOOSE, DARK GRAY, SILTY SAND, MOIST 34.0'	0.0
34–36	S-13	2.0	1-1 1-1	VERY LOOSE, REDDISH BROWN, SILTY SAND, TRACE GRAVEL, MOIST 34.0' VERY LOOSE, GRAY, CLAYEY SAND, MOIST TO WET	0.0
36–38	S-14	1.8	2-2 2-3	38.0'	0.0
38–40	S-15	2.0	2-3 2-2	LOOSE, GRAY, CLAYEY SAND, TRACE GRAVEL, MOIST	0.0

WELL INSTALLATION DETAIL



ELEVATION (FT. M.S.L.): 741.22, 740.84, 730.00, 720.00, 710.00, 700.00

CUMMINGS RITER CONSULTANTS, INC.

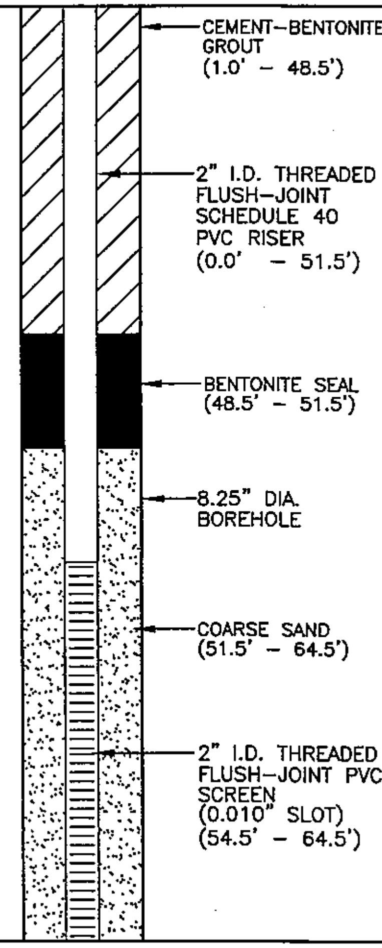
LOG OF BORING NO. E-60

Client: HERCULES INC. Project No. 01305.40
Site Name: JEFFERSON PLANT Date Started: 12-30-03
Location: WEST ELIZABETH, PA Date Completed: 1-6-04
Drilling Co. CHATFIELD DRILLING Field Geologist: CGK Depth to GW: 16 FT BGS.
Driller: AARON HUGHES Checked By: CLN Date/Time: 1-6-04
Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,823.47 E 4,641.74
Surface Elev. 746.60'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
40	S-16	1.7	2-2, 3-3	VERY LOOSE, BROWN, CLAYEY SAND, TRACE GRAVEL, WET 41.0'; LOOSE, GRAY, CLAYEY SAND, TRACE GRAVEL, MOIST	0.0	
	S-17	2.0	2-4, 4-5	44.6'	0.0	
45	S-18	1.1	5-5, 6-7	LOOSE, BROWN, CLAYEY SAND, MOIST 46.0'	0.0	
	S-19	1.1	7-8, 9-11	MEDIUM DENSE, BROWN, SILTY SAND, SANDSTONE FRAGMENTS, MOIST	0.0	
	S-20	0.9	7-8, 17-18	50.0'	0.0	690.00
50	S-21	1.2	7-8, 10-12	MEDIUM DENSE, GRAY AND BROWN, SAND AND GRAVEL, DRY TO MOIST	0.0	
	S-22	1.3	8-8, 10-10		0.0	
55	S-23	1.7	10-10, 14-24	56.1'	0.0	
	S-24	1.5	8-14, 17-20	HARD, BLACK, COAL FRAGMENTS, DRY 56.2'; MEDIUM DENSE, GRAY AND BROWN, SAND AND GRAVEL, MOIST	0.0	
	S-25	1.7	3-8, 10-17		0.0	
60	S-26	1.8	14-18, 22-25	62.0'	0.0	
	S-27	1.3	15-20, 25-50/3	DENSE, GRAY AND BROWN, SAND AND GRAVEL, MOIST 63.9'; HARD, GRAY, SANDSTONE, WEATHERED, DRY	0.0	682.10
65				*BOTTOM OF BORING AT 64.5'* WELL E-60 INSTALLED WITH SCREEN SET FROM 54.5'-64.5' BGS		
70						
75						
80						

WELL INSTALLATION DETAIL



REMARKS
WOH = WEIGHT OF HAMMER

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. E-61

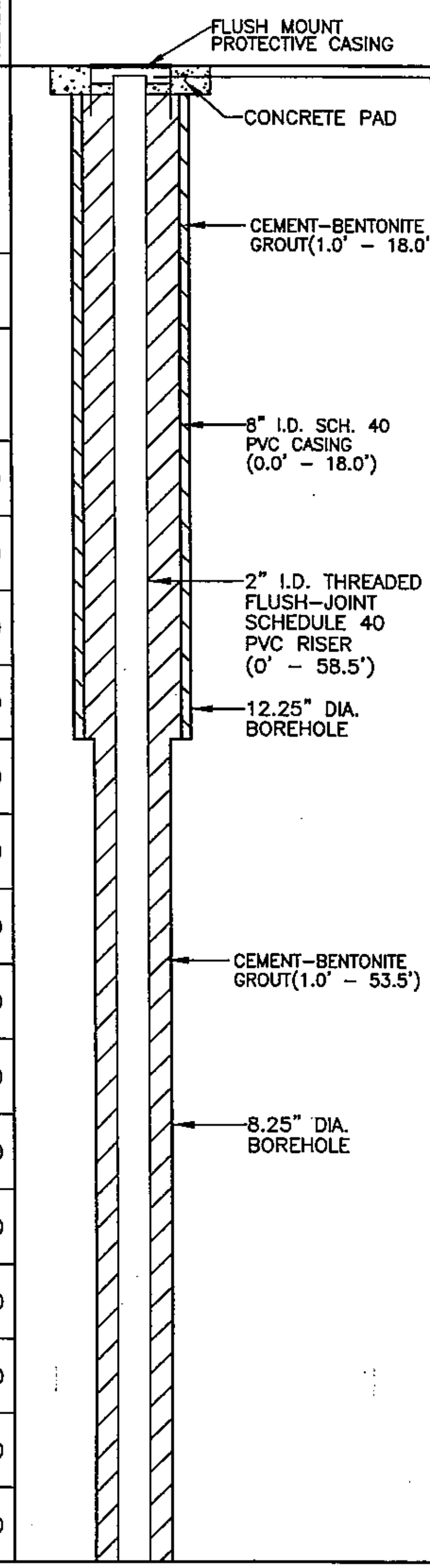
Client:	HERCULES INC.	Project No.	01305.40
Site Name:	JEFFERSON PLANT	Date Started:	1-8-04
Location:	WEST ELIZABETH, PA	Date Completed:	1-13-04
Drilling Co.	CHATFIELD DRILLING	Field Geologist:	CGK
Depth to GW:	7 FT BGS.	Driller:	AARON HUGHES
Checked By:	CLN	Date/Time:	1-13-04 / 15:15

Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,710.383 E 4,194.94
Surface Elev. 748.61'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
0				VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY TO WET		748.61 / 747.92
5	S-1	2.0	WOH-3 3-3		0.0	
				WATER ENCOUNTERED AT 7.0 FT. BGS.	–	740.00
10	S-2	0.3	5-7 WOH		0.0	
	S-3	1.1	WOH-1 1-1	14.0'	0.0	
15	S-4	1.7	1-3 3-5	SOFT TO MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, SANDY CLAY, TRACE GRAVEL, MOTTLED, MOIST	0.0	
	S-5	2.0	1-4 4-4		0.0	730.00
	S-6	1.6	2-3 3-2		0.0	
20	S-7	1.5	2-3 3-4		0.0	
	S-8	2.0	7-7 7-7	24.0'	0.0	
25	S-9	1.5	1-2 2-4	SOFT, REDDISH BROWN, SILTY CLAY, MOIST	0.0	
	S-10	1.9	1-1 1-1	26.9' VERY LOOSE, GRAY, SANDY CLAY, MOIST	0.0	
	S-11	2.0	WOH-WOH WOH-1		0.0	720.00
30	S-12	2.0	1-2 1-2	31.1' VERY SOFT, GRAY, SANDY CLAY, TRACE GRAVEL, MOIST	0.0	
	S-13	2.0	1-1 2-1		0.0	
35	S-14	1.8	WOH-WOH 1-1	35.1' VERY LOOSE, DARK GRAY, CLAYEY SAND, MOIST	0.0	
	S-15	1.7	1-2 2-7	37.4' MEDIUM STIFF, GRAY, SANDY CLAY, TRACE SAPROLITE FRAGMENTS, DRY	0.0	
	S-16	1.8	WOH-1 1-4	38.0' VERY SOFT, BROWN, SANDY SILT, TRACE GRAVEL, MOIST	0.0	710.00
40						

WELL INSTALLATION DETAIL



CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. E-61

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 1-8-04
Location: WEST ELIZABETH, PA
Date Completed: 1-13-04
..ing Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 7 FT BGS.
Driller: AARON HUGHES
Checked By: CLN
Date/Time: 1-13-04 / 15:15
Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,710.383 E 4,194.94
Surface Elev. 748.61'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
40	S-17	1.9	WOH-1, 1-2	VERY LOOSE, BROWN, SILTY SAND, WET 41.1'; SOFT, OLIVE GREEN, SANDY SILT, DRY 42.4'	0.0	
	S-18	2.0	1-1, 1-1	LOOSE, GRAY, SILTY SAND, MOIST 44.0'	0.0	
45	S-19	1.5	2-2, 3-3	MEDIUM DENSE, BROWN AND GRAY, SAND AND GRAVEL, TRACE CLAY, DRY	0.0	
	S-20	1.8	4-6, 6-4		0.0	
	S-21	1.9	6-6, 5-6		0.0	700.00
50	S-22	2.0	7-7, 8-7	52.0'	0.0	
	S-23	1.9	5-5, 6-8	LOOSE, BROWN, SAND, MEDIUM GRAINED, MOIST 53.0'; MEDIUM DENSE, BROWN AND GRAY, SAND AND GRAVEL, DRY	0.0	
55	S-24	1.8	7-8, 8-10		0.0	
	S-25	2.0	2-3, 3-3	57.0'; LOOSE, GRAY TO OLIVE GREEN, SAND, MEDIUM GRAINED, MOIST	0.0	
	S-26	1.6	8-8, 9-9	60.0'	0.0	690.00
60	S-27	2.0	7-7, 8-7	MEDIUM DENSE, GRAY AND OLIVE GREEN, SAND, MEDIUM GRAINED, INTERMITTENT COAL LAYERS, MOIST	0.0	
	S-28	1.8	6-7, 8-8		0.0	
65	S-29	1.7	5-6, 6-6		0.0	
	S-30	1.5	10-12, 12-13		0.0	
	S-31	0.5	50/5	69.1'; HARD, BLACK, SHALE, DRY	0.0	679.11
70				*BOTTOM OF BORING AT 69.1'* WELL E-61 INSTALLED WITH SCREEN SET FROM 58.5'-68.5' BGS		
80						

WELL INSTALLATION DETAIL

REMARKS
WOH = WEIGHT OF HAMMER

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. E-62

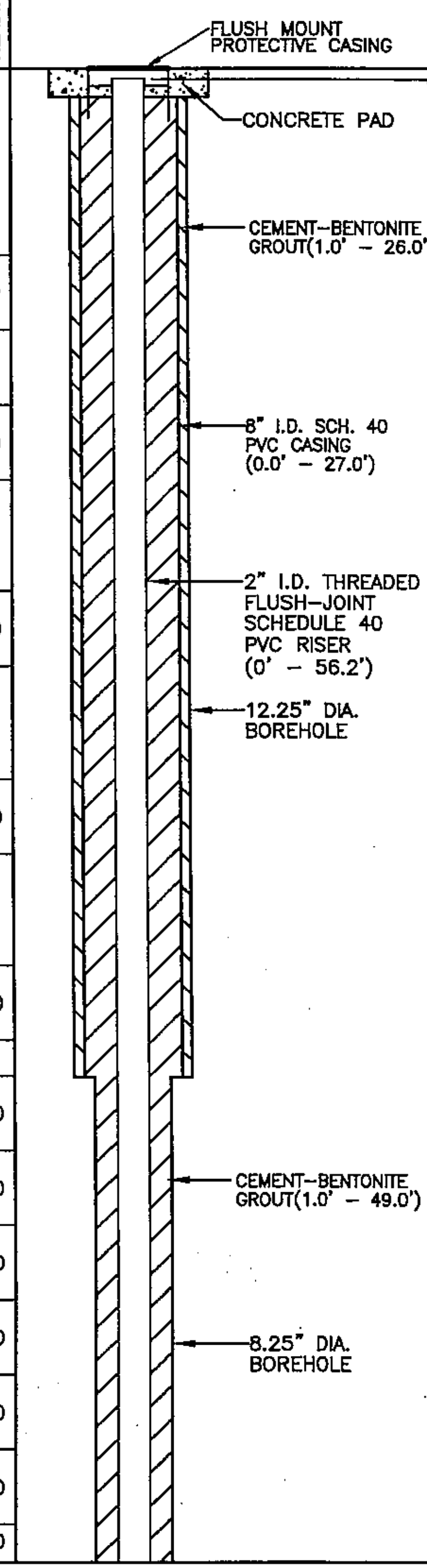
Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 12-18-03	
Location: WEST ELIZABETH, PA		Date Completed: 12-23-03	
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 15 FT BGS.	
Driller: AARON HUGHES	Checked By: CLN	Date/Time: 12-23-03	

Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGER WIH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,278.98 E 3,328.43
Surface Elev. 758.70'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
0							758.70
0 – 5.0					VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 5.0'		758.36
5	S-1	1.1	2-3 6-7		SOFT, LIGHT GRAY AND REDDISH BROWN, SILTY CLAY, MOTTLED, MOIST	0.0	
					9.0'		750.00
10	S-2	1.7	2-2 3-4		VERY SOFT TO SOFT, REDDISH BROWN, SILTY CLAY, TRACE SAND, MOIST	0.0	
15	S-3	2.0	1-1 1-2		WATER ENCOUNTERED AT 15.0 FT. BGS.	0.0	
							740.00
20	S-4	1.0	WOH-WOH WOH-WOH			0.0	
					24.0'		
25	S-5	2.0	WOH-WOH WOH-WOH		VERY SOFT, LIGHT GRAY, SANDY CLAY, WET	0.0	
					27.0'		
	S-6	2.0	WOH-WOH 1-1		VERY SOFT TO SOFT, LIGHT GRAY, SANDY CLAY, MOIST	0.0	730.00
30	S-7	1.3	1-3 2-2		31.0'	0.0	
	S-8	1.9	2-3 4-4		SOFT, LIGHT GRAY, SANDY CLAY, WET	0.0	
	S-9	1.6	1-2 2-3		34.0' SOFT, GREENSIH GRAY, SILTY CLAY, MOIST 35.0'	0.0	
35	S-10	1.1	1-3 5-5		MEDIUM STIFF TO STIFF, DARK GRAYISH BROWN, SILTY CLAY, TRACE SAND AND GRAVEL, DRY	0.0	
	S-11	1.7	5-5 5-5		39.0'	0.0	720.00
40	S-12	1.9	WOH 1		SOFT, DARK GRAYISH BROWN, SILTY CLAY, TRACE SAND, MOIST	0.0	

WELL INSTALLATION DETAIL



CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. E-62

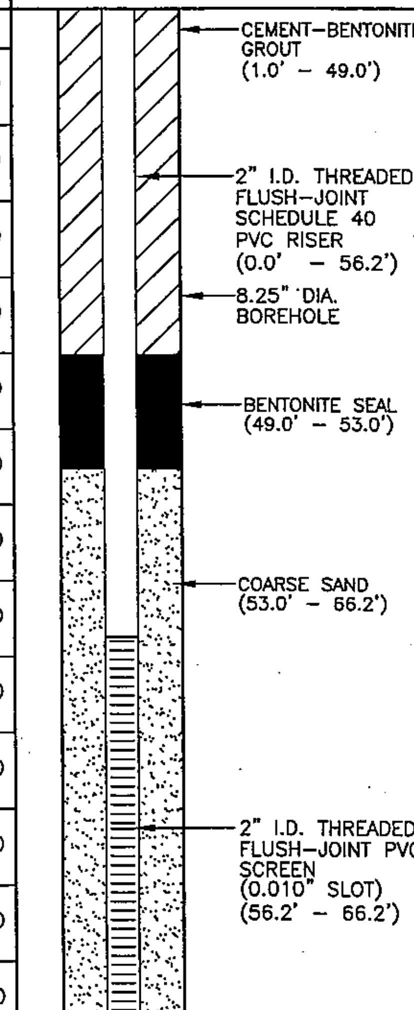
Client:	HERCULES INC.	Project No.	01305.40
Site Name:	JEFFERSON PLANT	Date Started:	12-18-03
Location:	WEST ELIZABETH, PA	Date Completed:	12-23-03
Drilling Co.	CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 15 FT BGS.
Driller:	AARON HUGHES	Checked By: CLN	Date/Time: 12-23-03

Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGER WIH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 4,278.98 E 3,328.43
Surface Elev. 758.70'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)
40				41.0'	
	S-13	1.8	1-2, 3-3	MEDIUM STIFF, DARK GRAY, SILTY CLAY, MOIST 43.0'	0.0
	S-14	2.0	WOH-1, 2-3	VERY SOFT TO SOFT, DARK GRAY, SAND CLAY, WET	0.0
45	S-15	1.1	WOH-WOH, 1-5	45.8' MEDIUM STIFF, DARK GRAY, SILTY CLAY, SOME SANDSTONE FRAGMENTS, MOIST	0.0
	S-16	1.7	WOH-1, 2-3		0.0
50	S-17	1.8	2-3, 3-4		0.0
	S-18	1.8	2-3, 6-3	53.0'	0.0
	S-19	1.7	4-7, 6-5	MEDIUM STIFF, DARK GRAY, SILTY CLAY, SOME SANDSTONE FRAGMENTS, WET 54.1'	0.0
55	S-20	2.0	2-3, 3-2	MEDIUM STIFF TO STIFF, DARK GRAY, SILTY CLAY, TRACE SAND, DRY	0.0
	S-21	2.0	1-1, 1-7	59.0'	0.0
60	S-22	1.8	1-1, 2-3	MEDIUM STIFF, DARK GRAY, SILTY CLAY, TRACE GRAVEL, MOIST 61.0'	0.0
	S-23	1.9	WOH-1, 2-3	MEDIUM STIFF, DARK GRAY, SANDY CLAY, TRACE SHALE FRAGMENTS, DRY 63.0'	0.0
	S-24	2.0	4-5, 9-6	MEDIUM STIFF, DARK GRAY, SANDY CLAY, TRACE GRAVEL, WET 64.4'	0.0
65	S-25	1.1	2-9, 50/4	STIFF, DARK GRAY, SANDY CLAY AND SAPROLITE, DRY 65.6' HARD, DARK GRAY TO GREEN, SHALE, WEATHERED, DRY	0.0
				BOTTOM OF BORING AT 66.2' WELL E-62 INSTALLED WITH SCREEN SET FROM 56.2'-66.2' BGS	
70					
80					

WELL INSTALLATION DETAIL



ELEVATION (FT. M.S.L.): 710.00; 700.00; 692.50

REMARKS
WOH = WEIGHT OF HAMMER

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. E-63

Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 1-7-04	
Location: WEST ELIZABETH, PA		Date Completed: 1-12-04	
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 16.9 FT BGS.	
Driller: AARON HUGHES	Checked By: CLN	Date/Time: 1-12-04	

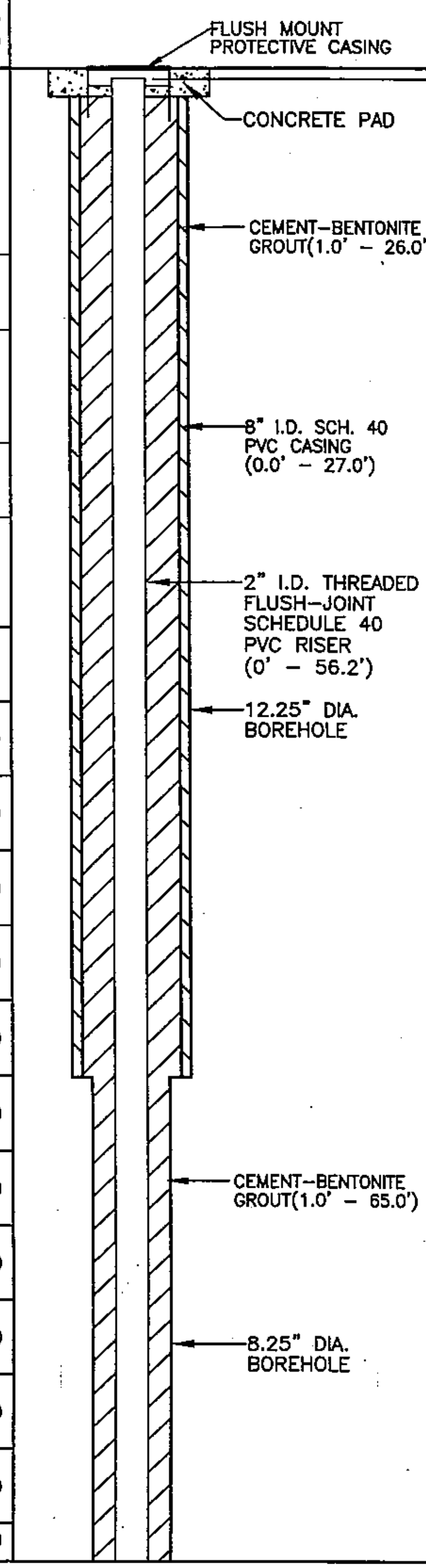
Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 5,472.08 E 4,823.73

Surface Elev. 757.86'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	DESCRIPTION	HEADSPACE PID READING (PPM)
0–5.0				VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 5.0'	
5	S-1	2.0	2-2 4-5	MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOTTLED, DRY 10.0'	0.0
10	S-2	2.0	2-2 3-3	SOFT, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY 15.0'	0.0
15	S-3	1.9	1-2 3-3	SOFT, REDDISH BROWN, SANDY CLAY, DRY TO MOIST 16.9'	0.0
	S-4	1.8	1-2 2-3	VERY SOFT, REDDISH BROWN, SANDY CLAY, WET WATER ENCOUNTERED AT 16.9 FT. BGS.	0.0
20	S-5	2.0	WOH-WOH WOH-1	21.0'	0.0
	S-6	1.6	1-1 WOH-1	VERY LOOSE, REDDISH BROWN, CLAYEY SAND, WET	0.0
	S-7	2.0	WOH-WOH 2-2	24.1' VERY SOFT, REDDISH BROWN, SANDY CLAY, MOIST	0.0
25	S-8	1.7	WOH-1 2-2		0.0
	S-9	2.0	WOH-1 2-3	29.3'	0.0
30	S-10	2.0	WOH-WOH WOH-WOH	VERY LOOSE, REDDISH BROWN, SAND, MEDIUM GRAINED, WET 30.4'	0.0
	S-11	1.9	3-3 4-5	VERY SOFT, REDDISH BROWN, SANDY CLAY, MOIST 31.5' VERY SOFT, REDDISH BROWN, SANDY CLAY, MOIST 33.4'	0.0
	S-12	1.8	2-4 4-10	MEDIUM STIFF, GRAY, SILTY CLAY, TRACE SAND, MOIST 34.8'	0.0
35	S-13	1.9	7-9 10-13	MEDIUM DENSE, REDDISH BROWN, SAND AND GRAVEL, DRY 35.9' MEDIUM STIFF, GRAY, SILTY SAND, MOIST	0.0
	S-14	2.0	4-5 5-5	37.7' MEDIUM STIFF, GRAY, SILTY CLAY, TRACE SAND, MOIST 39.0'	0.0
40	S-15	1.1	10-12	STIFF, GRAY, SILTY CLAY, TRACE SAND, DRY	0.0

WELL INSTALLATION DETAIL



ELEVATION (FT. M.S.L.): 758.70, 757.44, 750.00, 740.00, 730.00, 720.00

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. FP-1

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-2-03
Location: WEST ELIZABETH, PA
Date Completed: 12-2-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 15.6 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-2-03 / 13:00
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 3950.94 E 3865.42
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	-	-		HARD, GRAY TO BLACK, FILL MATERIAL, DRY 4.0'	- / -	
5	S-1	3.1		MEDIUM STIFF, LIGHT GRAY TO REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOTTLED, DRY 5.2' SOFT, YELLOWISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOIST 8.6'	0.0 / 0.0	
10	S-2	4.0		MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY	0.0 / 0.0	
15	S-3	4.0		WATER ENCOUNTERED AT 15.6 FT BGS 15.6' VERY SOFT, BROWN, CLAYEY SILT, WET 16.0'	0.0 / 0.0	FP-1 (13.6' - 15.6') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
20				*BOTTOM OF BORING AT 16.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
35						
40						

CUMMINGS RITER CONSULTANTS, INC.

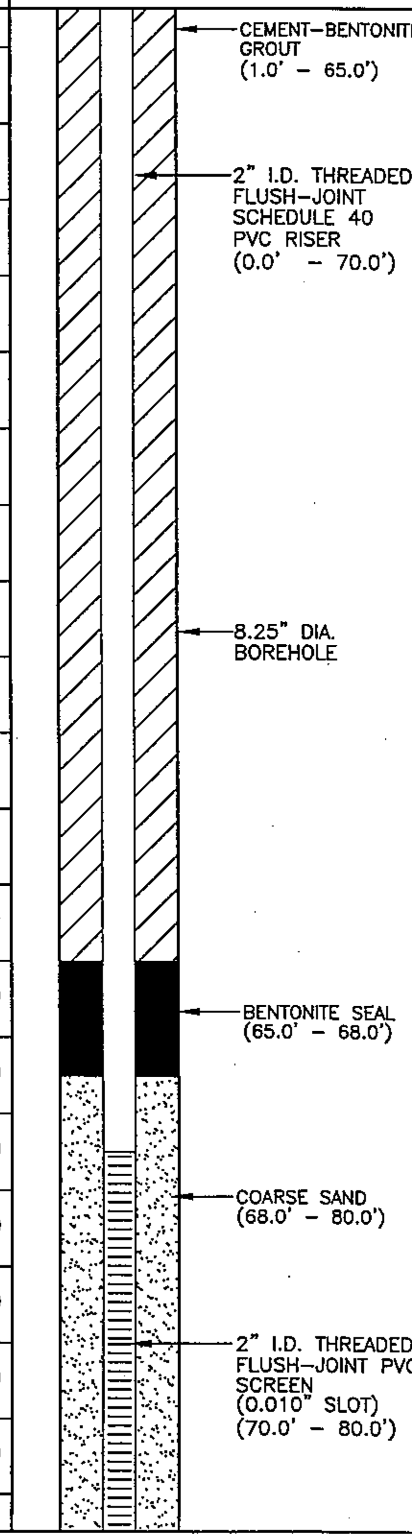
LOG OF BORING NO. E-63

Client: HERCULES INC. | Project No. 01305.40
Site Name: JEFFERSON PLANT | Date Started: 1-7-04
Location: WEST ELIZABETH, PA | Date Completed: 1-12-04
ng Co. CHATFIELD DRILLING | Field Geologist: CGK | Depth to GW: 16.9 FT BGS.
Driller: AARON HUGHES | Checked By: CLN | Date/Time: 1-12-04
Drilling Method: 10.25" I.D. AND 4.25" I.D. HOLLOW STEM AUGERS WITH 2" O.D. SPLIT SPOON SAMPLERS AND SPT

Coordinates N 5,472.08 E 4,823.73
Surface Elev. 757.86'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	SPT BLOWS (6")	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
40	S-15	1.1	12-13		STIFF, GRAY, SILTY CLAY, TRACE SAND, DRY		
	S-16	1.2	8-10 10-12		43.5'	0.0	
	S-17	2.0	8-8 10-10		MEDIUM STIFF, GRAY, SANDY CLAY, MOIST 45.0'	0.0	
45	S-18	1.8	10-10 13-12		STIFF, DARK GRAY, SANDY CLAY, TRACE GRAVEL, MOIST	0.0	
	S-19	1.1	12-10 10-12			0.0	710.00
50	S-20	2.0	10-12 12-12			0.0	
	S-21	2.0	8-10 10-10			0.0	
	S-22	1.9	10-13 13-14		53.9' STIFF, DARK BROWN, SILTY CLAY AND GRAVEL, MOIST	0.0	
55	S-23	1.1	8-9 9-10		57.0'	0.0	
	S-24	0.6	6-8 8-12		MEDIUM DENSE, YELLOWISH BROWN, SAND AND GRAVEL, WET	0.0	700.00
60	S-25	0.8	2-8 11-12		61.0'	0.0	
	S-26	1.9	3-6 6-9		LOOSE, YELLOWISH BROWN, SAND AND GRAVEL, WET 62.1' LOOSE, DARK GRAY, SILTY SAND, TRACE GRAVEL, MOIST	0.0	
	S-27	1.4	1-9 8-3			0.0	
65	S-28	1.7	1-4 7-7			0.0	
	S-29	1.6	2-4 7-7			0.0	690.00
70	S-30	1.5	2-4 5-5		71.0'	0.0	
	S-31	1.2	2-2 5-7		LOOSE, YELLOWISH BROWN, SAND AND GRAVEL, MOIST 73.0'	0.0	
	S-32	1.3	7-8 12-19		MEDIUM DENSE, YELLOWISH BROWN, SAND AND GRAVEL, MOIST	0.0	
	S-33	1.2	7-14 14-18		77.6'	0.0	
	S-34	1.0	23 50/4		HARD, LIGHT GRAY TO OLIVE GREEN, SANDSTONE, WEATHERED, DRY *BOTTOM OF BORING AT 80.0'* WELL E-63 INSTALLED WITH SCREEN SET FROM 70.0'-80.0' BGS	0.0	680.00
80							678.70

WELL INSTALLATION DETAIL



CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. FP-2

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 11-25-03
Location: WEST ELIZABETH, PA
Date Completed: 11-25-03
[illegible]ing Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 16.5 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 11-25-03 / 15:35
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4178.66 E 3988.09
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–1			STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY	–	
2–3	–	–		–	
4–5				0.0	
6–7	S-1	4.0		0.0	
8–9			9.1'	0.0	
10–11	S-2	4.0	STIFF, REDDISH BROWN, SANDY SILT, DRY	0.0	
12–13			12.9' MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, MOIST	0.0	FP-2 (14.5' – 16.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
14–15	S-3	4.0		0.0	
16–17			WATER ENCOUNTERED AT 16.5 FT BGS 16.5' VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 17.6'	0.0	
18–20	S-4	4.0	STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY	0.0	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. FP-3

Client: HERCULES INC. | Project No. 01305.40
Site Name: JEFFERSON PLANT | Date Started: 12-2-03
Location: WEST ELIZABETH, PA | Date Completed: 12-2-03
Drilling Co. CHATFIELD DRILLING | Field Geologist: CGK | Depth to GW: 16.0 FT BGS
Driller: PAUL LORENO | Checked By: CLN | Date/Time: 12-2-03 / 9:33
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4178.66 E 3988.09
Surface Elev. ______

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	–	–	ASPHALT 1.5'	–	
			SOFT, REDDISH BROWN, SANDY SILT, MOIST 4.0'	–	
5	S-1	3.8	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOIST	0.0	
				0.0	
10	S-2	3.7		0.0	
			12.0'	0.0	
	S-3	4.0	SOFT, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL MOIST 12.4'	0.0	FP-3 (14.0' - 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
15			MEDIUM STIFF, REDDISH BROWN, SANDY SILT, TRACE GRAVEL, DRY WATER ENCOUNTERED AT 16.0 FT BGS 16.0'	0.0	
	S-4	3.5	VERY SOFT, REDDISH BROWN, SANDY SILT, WET 17.9'	0.0	
20			SOFT, REDDISH BROWN, SANDY SILT, MOIST 20.0'	0.0	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. FP-4

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-2-03
Location: WEST ELIZABETH, PA
Date Completed: 12-2-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 19.5 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-2-03 / 11:05
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4317.10 E 4028.75
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–0.6'	–	–	ASPHALT 0.6'		
0.6–1.8'			VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 1.8'	–	
1.8–4.0'			MEDIUM STIFF, REDDISH BROWN, SILTY CLAY, MOIST 4.0'	–	
4.0–5.1'	S-1	4.0	SOFT, REDDISH BROWN, SILTY CLAY, TRACE GRAVEL, DRY 5.1'	0.0	
5.1–8.7'			STIFF, LIGHT GRAY AND REDDISH BROWN, SANDY CLAY, TRACE GRAVEL, MOTTLED, DRY 8.7'	0.0	
8.7–12.0'	S-2	2.8	STIFF, BROWN, CLAYEY SILT, TRACE GRAVEL, DRY 12.0'	0.0 / 0.0	
12.0–19.5'	S-3	2.1	MEDIUM STIF, BROWN, CLAYEY SILT, MOIST	0.0 / 0.0	
	S-4	4.0	WATER ENCOUNTERED AT 19.5 FT BGS 19.5'	0.0 / 0.0	FP-4 (17.5' - 19.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
19.5–20.0'			VERY SOFT, BROWN, CLAYEY SILT, WET 20.0'		

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-1

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-4-03
Location: WEST ELIZABETH, PA
Date Completed: 12-4-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 17.1 FT. BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-4-03 / 9:20
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4859.27 E 4427.45
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	4.0	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 0.8'	0.0	LP-1 (0.0' -2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
			STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, MOIST	0.0	
5	S-2	3.2		0.0	
			8.0'	0.0	
10	S-3	4.0	STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY	0.0	
				0.0	
	S-4	4.0		0.0	
15			15.1'		
			SOFT, REDDISH BROWN, SANDY SILT, WET	0.0	LP-1 (15.1 - 17.1') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-5	1.2	WATER ENCOUNTERED AT 17.1 FT BGS 17.1'	0.0	
			VERY SOFT, REDDISH BROWN, SANDY SILT, WET	0.0	
20			20.0'		
			BOTTOM OF BORING AT 20.0'		
			BORING BACKFILLED WITH BENTONITE CHIPS		
25					
30					
35					
40					

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-2

Drilling Co.: CHATFIELD DRILLING	Client: HERCULES INC.	Project No.: 01305.40
Driller: PAUL LORENO	Site Name: JEFFERSON PLANT	Date Started: 12-11-03
	Location: WEST ELIZABETH, PA	Date Completed: 12-15-03
	Field Geologist: CGK	Depth to GW: 16.7 FT. BGS
	Checked By: CLN	Date/Time: 12-11-03 / 9:35

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5,004.35 E 4,558.03

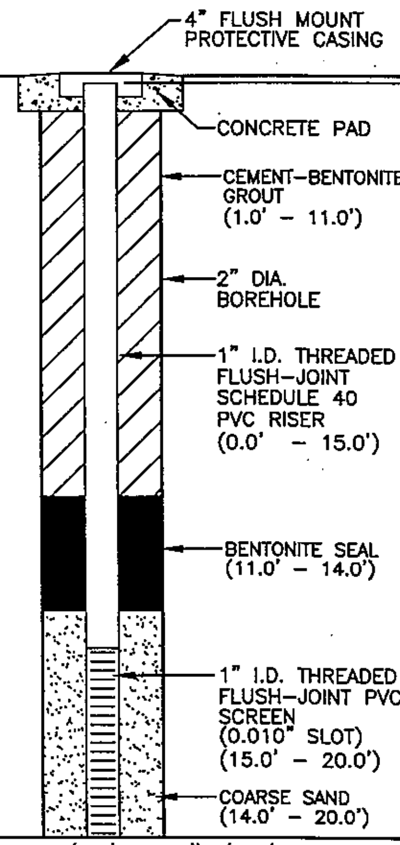
Surface Elev. 754.38'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)
0–4	S-1	4.0	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 0.2' STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY	0.0 0.0
4–8	S-2	4.0	5.3' SOFT, REDDISH BROWN, CLAYEY SILT, TRACE SAND, DRY	0.0 0.0
8–12	S-3	4.0	12.0'	0.0 0.0
12–16	S-4	3.9	MEDIUM STIFF, REDDISH BROWN, SANDY SILT, MOIST 16.5'	0.0 0.0
16–20	S-5	2.1	SOFT, DARK GRAY, SANDY SILT, MOIST, PETROEUM ODOR WATER ENCOUNTERED AT 16.7 FT. BGS 16.7' VERY SOFT, DARK GRAY SANDY SILT, WET 17.5' SOFT, REDDISH BROWN, CLAYEY SILT, TRACE SAND, MOIST 20.0'	520 135

BOTTOM OF BORING AT 20.0'

PIEZOMETER LP-2 INSTALLED WITH SCREEN SET FROM 15.0'-20.0' BGS

PIEZOMETER INSTALLATION DETAIL



ELEVATION (FT. M.S.L.): 754.38, 753.83, 750.00, 740.00, 734.38

LP-2 (0.0' - 2.0') /MS/MSD SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LP-2 (14.7' - 16.7') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-3

Drilling Co.: CHATFIELD DRILLING	Client: HERCULES INC.	Project No.: 01305.40
Driller: PAUL LORENO	Site Name: JEFFERSON PLANT	Date Started: 12-11-03
	Location: WEST ELIZABETH, PA	Date Completed: 12-11-03
	Field Geologist: CGK	Depth to GW: 21.5 FT. BGS
	Checked By: CLN	Date/Time: 12-11-03

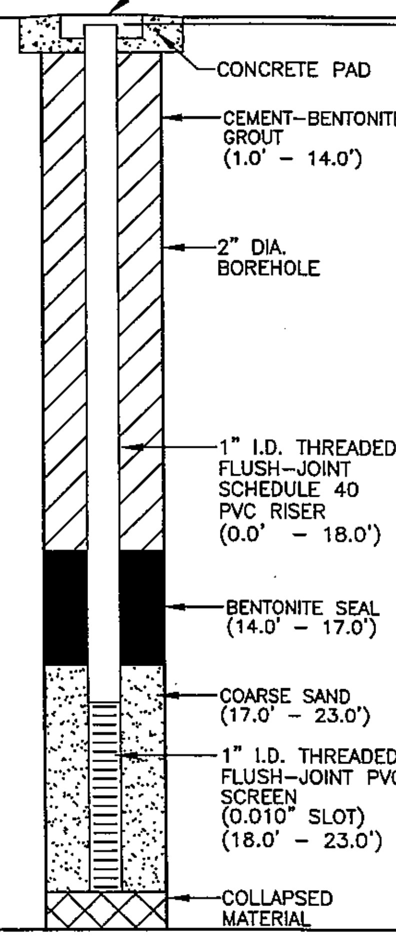
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5,141.73 E 4,718.17

Surface Elev. 756.32'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
0			ASPHALT 0.5'		756.32 / 756.06
	–	–	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 2.3'	–	
			VERY STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY 8.3'	–	
5	S-1	4.0		0.0	750.00
				0.0	
	S-2	4.0	VERY STIFF, MOTTLED LIGHT GRAY AND DARK BROWN CLAYEY SILT, DRY 12.2'	0.0	
10				0.0	
	S-3	3.8	MEDIUM DENSE, REDDISH BROWN, SILTY SAND, MOIST 16.0'	0.0	
15				0.0	740.00
	S-4	3.1	LOOSE, REDDISH BROWN, SILTY SAND, MOIST	0.0	
				0.0	
20	S-5	2.9	WATER ENCOUNTERED AT 21.5 FT. BGS. 21.5'	0.0	
			VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 21.9'		
			MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, MOIST 24.0'	0.0	736.52
25			*BOTTOM OF BORING AT 24.0'* PIEZOMETER LP-3 INSTALLED WITH SCREEN SET FROM 18.0'-23.0' BGS		
30					
35					
40					

PIEZOMETER INSTALLATION DETAIL



LP-3 (14.0' – 16.0')/DUP-3 SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-4

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-3-03
Location: WEST ELIZABETH, PA	Date Completed: 12-3-03
...ng Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 16.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-3-03 / 15:55

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4933.32 E 4859.00
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0				ASPHALT 1.5'	–	
	–	–		STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOIST 4.0'	–	
5	S-1	4.0		SOFT, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOIST 4.9'	0.0	
				STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, DRY	0.0	
10	S-2	4.0			0.0	
					0.0	
	S-3	4.0			0.0	
15				WATER ENCOUNTERED AT 16.0 FT BGS 16.0'	0.0	LP-4 (14.0' – 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-4	0.2		VERY SOFT, GRAY, CLAYEY SILT, WET	0.0	
20				20.0'	–	

BOTTOM OF BORING AT 20.0'
BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 25, 30, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-5

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-9-03
Location: WEST ELIZABETH, PA	Date Completed: 12-9-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 21.0 FT. BGS
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-9-03 / 16:25

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4,887.58 E 4,703.11

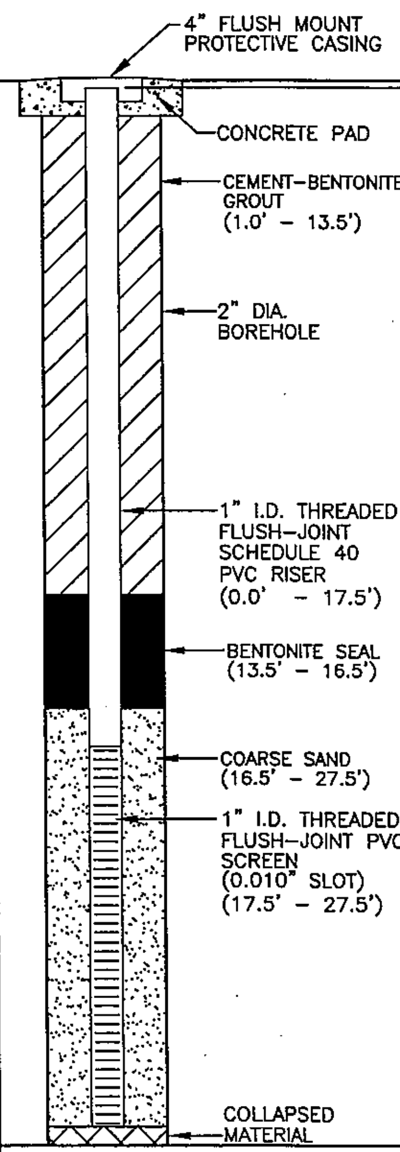
Surface Elev. 752.06'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE -PID READING (PPM)
0–4	S-1	3.1	DENSE, GRAY AND BLACK, FILL MATERIAL, MOIST TO DRY (to 4.6')	0.0, 0.0
4–8	S-2	4.0	VERY STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY	0.0, 0.0
8–12	S-3	4.0		0.0, 0.0
12–16	S-4	4.0		0.0, 0.0
16–20	S-5	4.0		0.0, 0.0
20–24	S-6	4.0	WATER ENCOUNTERED AT 21.0 FT. BGS. (21.0') SOFT, DARK GRAY, CLAYEY SILT, TRACE SAND, WET	0.0, 0.0
24–28	S-7	3.7	(27.2') SOFT, BROWN, CLAYEY SILT, MOIST (28.0')	4.0, 25

BOTTOM OF BORING AT 28.0'

PIEZOMETER LP-5 INSTALLED WITH SCREEN SET FROM 17.5'-27.5' BGS

PIEZOMETER INSTALLATION DETAIL



ELEVATION (FT. M.S.L.): 752.06, 751.56, 750.00, 740.00, 730.00, 724.06

LP-5 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LP-5 (21.0' - 23.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-6

Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 12-9-03	
Location: WEST ELIZABETH, PA		Date Completed: 12-17-03	
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 24.0 FT. BGS	
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-9-03 / 13:17	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4,839.98 E 4,928.16
Surface Elev. 743.45

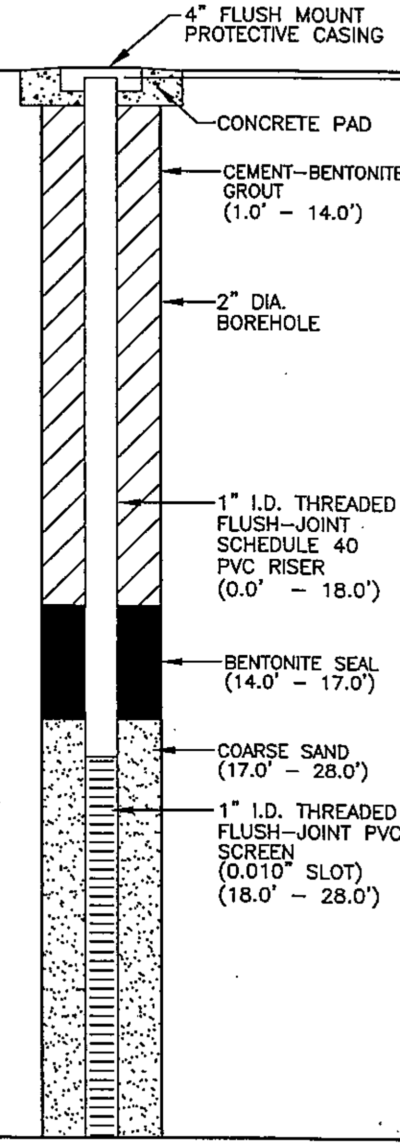
SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	HEADSPACE PID READING (PPM)
S-1	2.9	155, 148
S-2	3.9	371, 1531
S-3	4.0	190, 109
S-4	4.0	219, 172
S-5	4.0	133, 39.8
S-6	4.0	28.2, 0.0
S-7	0.3	0.0, 0.0

DEPTH (FEET)	DESCRIPTION
0 – 1.2'	DENSE, GRAY TO BLACK, FILL MATERIAL, DRY
1.2' – 6.2'	VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, MOTTLED, MOIST
6.2' – 8.2'	VERY STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY
8.2' – 16.3'	VERY STIFF, REDDISH BROWN, CLAYEY SILT, DRY
16.3' – 22.1'	STIFF, REDDISH BROWN, SANDY SILT, DRY
22.1' – 24.1'	MEDIUM STIFF, REDDISH BROWN, SANDY SILT, MOIST WATER ENCOUNTERED AT 24.0 FT. BGS.
24.1' – 28.0'	VERY SOFT, REDDISH BROWN, SANDY SILT, WET

BOTTOM OF BORING AT 28.0'

PIEZOMETER LP-6 INSTALLED WITH SCREEN SET FROM 18.0'-28.0' BGS

PIEZOMETER INSTALLATION DETAIL



LP-6 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LP-6 (22.0' - 24.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-7

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-9-03
Location: WEST ELIZABETH, PA	Date Completed: 12-15-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK
Depth to GW: 20.0 FT. BGS	Driller: PAUL LORENO
Checked By: CLN	Date/Time: 12-9-03 /15:03

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

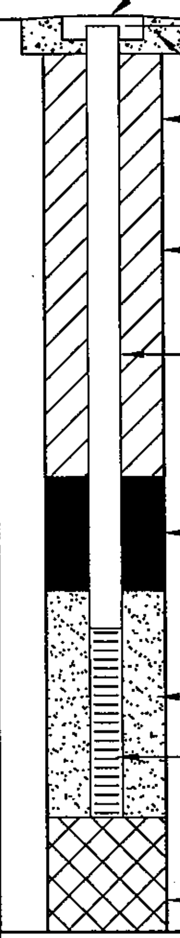
Coordinates N 4,944.73 E 5,146.96
Surface Elev. 742.96'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)
0 – 1.9'	S-1	3.1	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY (1.9')	0.0
1.9' – 6.7'	S-1 / S-2	3.1 / 4.0	VERY STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY (6.7')	0.0, 0.0
6.7' – 20.0'	S-2 / S-3 / S-4 / S-5	4.0 / 4.0 / 4.0 / 4.0	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE SAND, MOIST. WATER ENCOUNTERED AT 20.0 FT. BGS. (20.0')	0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0
20.0' – 20.9'	S-6	4.0	VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET (20.9')	0.0
20.9' – 24.0'	S-6	4.0	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, DRY (24.0')	0.0

BOTTOM OF BORING AT 24.0'

PIEZOMETER LP-7 INSTALLED WITH SCREEN SET FROM 16.0'-21.0' BGS

PIEZOMETER INSTALLATION DETAIL



LP-7 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LP-7 (18.0' - 20.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-8

Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 12-9-03	
Location: WEST ELIZABETH, PA		Date Completed: 12-9-03	
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 17.0 FT. BGS	
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-9-03 /09:10	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4,724.46 E 5,015.94

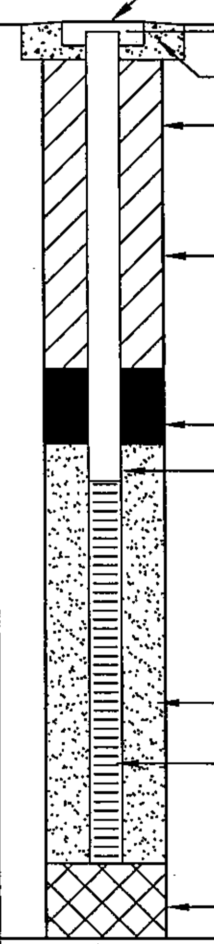
Surface Elev. 741.91'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)
0–2	S-1	3.4	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, MOIST (to 2.6')	514
2–4			MEDIUM STIFF, MOTTLED LIGHT GRAY AND REDDISH-BROWN, CLAYEY SILT, MOIST	512
4–6	S-2	2.9		1700
6–8			(6.5') VERY SOFT, DARK GRAY, CLAYEY SILT, MOIST (to 8.0')	619
8–10	S-3	4.0	SOFT, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOIST	1455
10–12				192
12–14	S-4	4.0		0.0
14–16				0.0
16–18	S-5	4.0	WATER ENCOUNTERED AT 17.0 FT. BGS. (17.0') VERY SOFT, REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, WET	0.0
18–20			(to 20.0')	0.0
20–22	S-6	2.1	LOOSE, GRAY, CLAYEY SAND, MOIST	0.0
22–24			(to 24.0')	0.0

BOTTOM OF BORING AT 24.0'

PIEZOMETER LP-8 INSTALLED WITH SCREEN SET FROM 12.0'-22.0' BGS

PIEZOMETER INSTALLATION DETAIL



ELEVATION (FT. M.S.L.): 741.91, 741.57, 740.00, 730.00, 720.00, 717.91

LP-8 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LP-8 (15.0' - 17.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LOG OF BORING NO. LP-9

CUMMINGS RITER CONSULTANTS, INC.

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-8-03
Location: WEST ELIZABETH, PA	Date Completed: 12-8-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 8.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-8-03 / 15:15

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

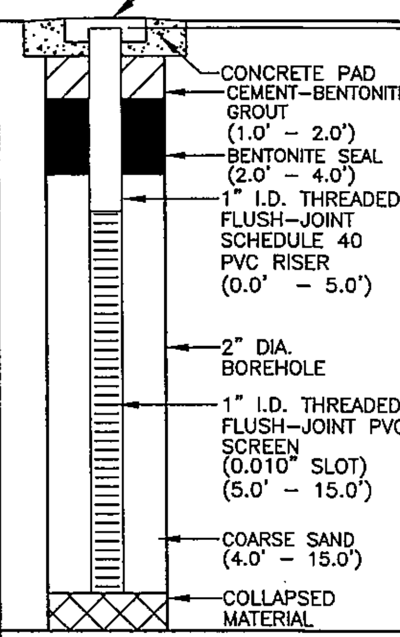
Coordinates N 4,702.10 E 4,844.03
Surface Elev. 741.47'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
0	–	–	DENSE, GRAY TO BLACK, FILL MATERIAL, MOIST	– / –	741.91 / 741.57 / 740.00
4.0'					
5	S-1	3.6	SOFT, DARK GRAY TO BLACK, CLAYEY SILT WITH TRACE SAND, MOIST	0.0 / 0.0	
	S-2	0.0	WATER ENCOUNTERED AT 8.0 FT. BGS	– / –	
12.0'					730.00
	S-3	1.8	SOFT, MEDIUM BROWN, CLAYEY SILT, MOIST	0.0 / –	
16.0'					725.91

BOTTOM OF BORING AT 16.0'

PIEZOMETER LP-9 INSTALLED WITH SCREEN SET FROM 5.0'-15.0' BGS

PIEZOMETER INSTALLATION DETAIL



LP-9 (5.6' – 7.6') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. LP-10

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-4-03
Location: WEST ELIZABETH, PA
Date Completed: 12-4-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 18.0 FT. BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-4-03 / 10:30
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5099.94 E 5072.59
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–1.5'	–	–	ASPHALT	–	
1.5'–4.0'			MEDIUM STIFF, GRAY, CLAYEY SILT, GRAVEL, MOIST	–	
4.0'–8.0'	S-1	0.5	MEDIUM STIFF, DARK GRAY, CLAYEY SILT, TRACE GRAVEL, MOIST	0.0 0.0	
8.0'–12.0'	S-2	4.0	STIFF, LIGHT GRAY AND REDDISH BROWN, SANDY SILT, TRACE GRAVEL, MOTTLED, DRY	0.0 0.0	
12.0'–16.0'	S-3	4.0	(continued) 16.0'	0.0 0.0	LP-10 (16.0' – 18.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
16.0'–18.0'	S-4	3.1	STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, SANDY SILT, TRACE GRAVEL, DRY WATER ENCOUNTERED AT 18.0 FT BGS 18.0'	0.0	
18.0'–20.0'			VERY SOFT, REDDISH BROWN, SANDY SILT, WET 20.0'	0.0	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SB-1

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 11-25-03
Location: WEST ELIZABETH, PA	Date Completed: 11-25-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 16.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 11-25-03 / 10:50

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4034.53 E 3965.33

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4	–	–	LOOSE, GRAY TO BLACK, FILL MATERIAL, MOIST (to 5.1')	–, –	
4–8	S-1	3.5	SOFT, DARK GRAY, CLAYEY SILT, MOIST STRONG PETROLEUM ODOR (5.1'–9.7')	52.4, 54.8	
8–12	S-2	3.0	STIFF, LIGHT GRAY AND REDDISH AND BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY STRONG PETROLEUM ODOR (9.7'–12.0')	39.6, 252	
12–16	S-3	4.0	SOFT, DARK GRAY, CLAYEY SILT, MOIST STRONG PETROLEUM ODOR (12.0'–13.5'); MEDIUM STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, DRY – STRONG PETROLEUM ODOR; WATER ENCOUNTERED AT 16.0 FT. BGS. (13.5'–16.0')	127, 45.6	
16–20	S-4	4.0	VERY SOFT, DARK GRAY, CLAYEY SILT, WET (16.0'–16.9'); MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY (16.9'–20.0')	51.4, 21.0	SB-1 (14.0' – 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SB-2

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 11-25-03
Location: WEST ELIZABETH, PA
Date Completed: 11-25-03
...ing Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 13.5 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 11-25-03 / 13:35
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4044.88 E 3980.07
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	–	–		HARD, GRAY TO BLACK, FILL MATERIAL, DRY 4.0'	– / –	
5	S-1	2.8		SOFT, LIGHT GRAY AND BROWN, CLAYEY SILT AND GRAVEL, MOIST 6.1'	0.0	
				SOFT, DARK GRAY, CLAYEY SILT, TRACE SAND, MOIST 8.0'	0.0	
	S-2	4.0		MEDIUM STIFF, OLIVE BROWN, CLAYEY SILT, MOIST 10.1'	0.0	
10				MEDIUM STIFF, DARK GRAY, CLAY, TRACE SAND, MOIST	0.0	SB-2 (11.5' – 13.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-3	4.0		WATER ENCOUNTERED AT 13.5' 13.5'	0.0	
				VERY SOFT, DARK GRAY, CLAYEY SILT, WET 14.5'		
15				STIFF, REDDISH BROWN, CLAYEY SILT, DRY 16.0'	0.0	
20				*BOTTOM OF BORING AT 16.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
35						
40						

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LOG OF BORING NO. SB-3

CUMMINGS RITER CONSULTANTS, INC.

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 11-25-03
Location: WEST ELIZABETH, PA	Date Completed: 11-25-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 16.0 FT BGS
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 11-25-03 / 11:20

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4013.68 E 3972.90

Surface Elev. ____

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4.0	–	–		HARD, GRAY TO BLACK, FILL MATERIAL, DRY (4.0')	– –	
4.0–6.2	S-1	4.0		MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT AND GRAVEL, DRY (6.2')	54.6	
6.2–9.1				SOFT, LIGHT GRAY TO REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOTTLED, DRY PETROLEUM ODOR (9.1')	283	
9.1–13.6	S-2	2.9		SOFT, DARK GRAY, SANDY SILT, MOIST PETROLEUM ODOR (13.6')	214 60.8	
13.6–16.0	S-3	4.0		STIFF, LIGHT GRAY TO REDDISH BROWN, CLAYEY SILT SILT, TRACE SAND, MOTTLED, DRY WATER ENCOUNTERED AT 16.0 FT BGS (16.0')	77.8 0.0	SB-3 (14.0' – 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
16.0–20.0	S-4	4.0		VERY SOFT, LIGHT GRAY, CLAYEY SILT, TRACE SAND, WET STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY (20.0')	0.0 0.1	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SB-4

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 11-25-03
Location: WEST ELIZABETH, PA	Date Completed: 11-25-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 10.0 FT BGS
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 11-25-03 / 13:00

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4023.83 E 3985.52

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4.0'	–	–	HARD, GRAY TO BLACK, FILL MATERIAL, DRY (4.0')	–, –	
4.0'–4.9'	S-1	2.2	VERY SOFT, DARK GRAY, CLAYEY SILT, AND GRAVEL, MOIST (4.9')	0.0	
4.9'–10.0'	S-1 / S-2	2.2 / 2.1	MEDIUM STIFF, DARK GRAY, CLAYEY SILT, TRACE GRAVEL, DRY WATER ENCOUNTERED AT 10.0' (10.0')	2.5, 0.0	SB-4 (8.0' – 10.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
10.0'–16.0'	S-2 / S-3	2.1 / 4.0	VERY SOFT, DARK GRAY, CLAYEY SILT, WET (16.0')	0.0, 0.0, 0.0	

BOTTOM OF BORING AT 16.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SB-5

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 11-25-03
Location: WEST ELIZABETH, PA
Date Completed: 11-25-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 14.0 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 11-25-03 / 14:45
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4042.27 E 3992.13
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4.0	–	–		HARD, GRAY TO BLACK, FILL MATERIAL, DRY (4.0')	– / –	
4.0–8.0	S-1	1.2		SOFT, DARK GRAY, CLAYEY SILT AND GRAVEL, MOIST (8.0')	0.0 / –	
8.0–12.0	S-2	0.4		STIFF, OLIVE BROWN, CLAYEY SILT, TRACE GRAVEL, MOIST (12.0')	0.0 / –	
12.0–16.0	S-3	4.0		MEDIUM STIFF, OLIVE BROWN, CLAYEY SILT, MOIST WATER ENCOUNTERED AT 14.0 FT BGS (14.0') VERY SOFT, DARK GRAY, CLAYEY SILT, WET (14.9') MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, DRY (16.0')	0.0 / 0.0	SB-5 (12.0' – 14.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

BOTTOM OF BORING AT 16.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. SB-6

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 11-25-03
Location: WEST ELIZABETH, PA	Date Completed: 11-25-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 15.0 FT BGS
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 11-25-03 / 9:55

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4021.94 E 3965.29

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4.0'	–	–	HARD, GRAY TO BLACK, FILL MATERIAL, DRY (4.0')	– / –	
4.0–6.1'	S-1	3.8	VERY STIFF, YELLOWISH BROWN, CLAYEY SILT, DRY (6.1')	0.0	
6.1–13.0'	S-1 / S-2		MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOTTLED, MOIST; WATER ENCOUNTERED AT 13.0 FT BGS (13.0')	0.0 / 0.0 / 0.0 / 0.0	SB-6 (11.0' – 13.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-2	2.1			
13.0–15.2'	S-3	3.4	VERY SOFT, YELLOWISH BROWN, CLAYEY SILT, WET (15.2')	0.0	
15.2–17.0'			SOFT, BROWN, SILTY CLAY, MOIST (17.0')	0.0	
17.0–20.0'	S-4	2.5	LOOSE, REDDISH BROWN, SILTY SAND, DRY (20.0')	0.0 / 0.0	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-1

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-8-03
Location: WEST ELIZABETH, PA
Date Completed: 12-8-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 11.7 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-8-03 / 10:35
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4910.29 E 3395.70
Surface Elev. ______

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	3.8		VERY STIFF, GRAY TO BLACK, FILL MATERIAL, DRY 3.1'	0.0 0.0	TF-1 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE SAND AND GRAVEL, MOTTLED, DRY 4.0'		
5	S-2	3.6		MEDIUM STIFF, LIGHT GRAY AND DARK BROWN, CLAYEY SILT, TRACE SAND, DRY	0.0 0.0	
10	S-3	4.0		WATER ENCOUNTERED AT 11.7 FT BGS 11.7'	0.0 0.0	TF-1 (9.7' - 11.7') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				SOFT, BROWN SAN, MEDIUM GRAINED, WET 12.0'		
15				*BOTTOM OF BORING AT 12.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
20						
25						
30						
35						
40						

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-2

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-12-03
Location: WEST ELIZABETH, PA	Date Completed: 12-12-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CLN
Depth to GW: ~8.0' BGS	Driller: MIKE LARIMER
Checked By: MJV	Date/Time: 12-12-03 / 13:50
Drilling Method: HAND AUGER	

Coordinates N 4854.05 E 3553.96
Surface Elev.

DEPTH (FEET)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0		STIFF, BROWN CLAY, SOME GRAY MOTTLING, DRY TO MOIST 4.0'		TF-2 (0.0' – 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
5		STIFF, TAN CLAY, MOIST 6.0'		
		STIFF, BROWN CLAY, SOME GRAY MOTTLING, WET TO MOIST WET AT ~8.0 FT BGS 8.0'		TF-2 (6.0' – 8.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
10		*BOTTOM OF BORING AT 8.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
15				
20				
25				
30				
40				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-3

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-8-03
Location: WEST ELIZABETH, PA
Date Completed: 12-8-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 9.4 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-8-03 / 9:30
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4990.91 E 3655.99
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	4.0		STIFF, LIGHT GRAY TO REDDISH BROWN, SANDY SILT, TRACE GRAVEL, MOTTLED, DRY 1.1'	0.0	TF-3 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				STIFF, LIGHT GRAY TO REDDISH BROWN CLAYEY SILT, TRACE GRAVEL, DRY 4.0'	0.0	
5	S-2	4.0		MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE SAND AND GRAVEL, DRY	0.0	
					0.0	TF-3 (7.4' - 9.4') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
10	S-3	4.0		WATER ENCOUNTERED AT 9.4' 9.4'	0.0	
				VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 9.6'		
				MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE SAND, MOIST 12.0'	0.0	
15						
20						
25						
30						
35						
40						

BOTTOM OF BORING AT 12.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-4

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-12-03
Location: WEST ELIZABETH, PA	Date Completed: 12-12-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CLN	Depth to GW: ~6.0' BGS
Driller: MIKE LARIMER / Checked By: MJV	Date/Time: 12-12-03 / 10:50
Drilling Method: HAND AUGER	

Coordinates N 5088.27 E 3782.86

Surface Elev. ______

DEPTH (FEET)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0		STIFF, BROWN, SILTY CLAY, SOME GRAY MOTTLING, DRY — 3.0'		TF-4 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
5		STIFF, BLACK, SILTY CLAY, TRACE GRAVEL, DRY WET ~6.0', OILY SHEEN ON WATER — 7.0'		TF-4 (4.0' - 6.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
		BOTTOM OF BORING AT 7.0' BORING BACKFILLED WITH BENTONITE CHIPS		
10				
15				
20				
25				
30				
40				

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-5

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-8-03
Location: WEST ELIZABETH, PA	Date Completed: 12-8-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 9.7 FT BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-8-03 / 11:30

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5181.13 E 3632.47
Surface Elev. ____

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4	S-1	4.0		VERY STIFF, GRAY TO BLACK, FILL MATERIAL, DRY	0.0 0.0	TF-5 (0.0' – 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
4–8	S-2	4.0		5.9' MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE SAND AND GRAVEL, MOTTLED, DRY	0.0 0.0	TF-5 (7.7' – 9.7') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
8–12	S-3	4.0		WATER ENCOUNTERED AT 9.7 FT BGS 9.7' VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 10.1' SOFT, DARK GRAY, CLAYEY SILT, TRACE SAND, MOIST 12.0'	0.0 0.0	

BOTTOM OF BORING AT 12.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-6

Client: HERCULES INC. | Project No. 01305.40
Site Name: JEFFERSON PLANT | Date Started: 12-8-03
Location: WEST ELIZABETH, PA | Date Completed: 12-8-03
Drilling Co. CHATFIELD DRILLING | Field Geologist: CGK | Depth to GW: 16.0 FT BGS
Driller: PAUL LORENO | Checked By: CLN | Date/Time: 12-8-03 / 13:35
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5313.91 E 3826.76
Surface Elev. ______

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	4.0		VERY STIFF, GRAY TO BLACK, FILL MATERIAL, DRY 0.2'		
				VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOTTLED, DRY 10.2'	0.0	TF-6 (0.0' – 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
					0.0	
5	S-2	4.0			0.0	
					0.6	
	S-3	4.0			7.7	
10				HARD, BLACK, COAL, DRY 10.3'		
				VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOTTLED, DRY 14.5'	17.7	
	S-4	4.0			0.0	TF-6 (14.0' – 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
15				VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOTTLED, MOIST 16.0'	251	
	S-5	3.8		SOFT, GRAY TO BLACK, CLAYEY SILT, GRAVEL, WET PETROLEUM ODOR – WATER ENCOUNTERED AT 16.0' 16.3'	203	
				VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, GRAVEL, DRY 20.0'	486	
20				*BOTTOM OF BORING AT 20.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
40						

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-7

Client: HERCULES INC.	Project No. 01305.40	
Site Name: JEFFERSON PLANT	Date Started: 12-12-03	
Location: WEST ELIZABETH, PA	Date Completed: 12-12-03	
Drilling Co. CHATFIELD DRILLING	Field Geologist: CLN	Depth to GW: ~7.0' BGS
Driller: MIKE LARIMER	Checked By: MJV	Date/Time: 12-12-03 / 10:50
Drilling Method: HAND AUGER		

Coordinates N 5100.03 E 3928.66

Surface Elev. ______

DEPTH (FEET)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0		STIFF, BROWN, SILTY CLAY, DRY TO MOIST	0.4	TF-7 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
			4.4	
5		5.5'	15.5	
		LOOSE, GRAY, SILTY SAND, TRACE CINDERS, MOIST 6.5'		TF-7 (5.5' - 7.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
		STIFF, BROWN CLAY, WET, OILY SHEEN ON WATER 8.0'	14.1	

BOTTOM OF BORING AT 8.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. TF-8

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-12-03
Location: WEST ELIZABETH, PA
Date Completed: 12-12-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CLN
Depth to GW: ~7.5' BGS
Driller: MIKE LARIMER
Checked By: MJV
Date/Time: 12-12-03 / 9:40
Drilling Method: HAND AUGER

Coordinates N 5088.27 E 3782.86
Surface Elev.

DEPTH (FEET)	PROFILE	DESCRIPTION		HEADSPACE PID READING (PPM)	REMARKS
0		LOOSE, GRAY GRAVEL AND BROWN SILTY CLAY, MOIST TO WET	1.0'		TF-8 (0.0' – 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
		STIFF, BROWN CLAY, SOME GRAY MOTTLING, MOIST	6.5'		TF-8 (6.0' – 7.5.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
		LOOSE, GRAY SAND, TRACE CINDERS, ODOR, MOIST	7.5'		
		STIFF, BROWN CLAY, WET	8.5'		

BOTTOM OF BORING AT 8.5"

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. V-1

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-5-03
Location: WEST ELIZABETH, PA
Date Completed: 12-5-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 14.9 FT BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-5-03 / 11:20
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4301.35 E 3526.20
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4	S-1	3.7		DENSE TO VERY DENSE, GRAY TO BLACK FILL MATERIAL, DRY	0.0 / 0.0	V-1 (0.0 - 2.0')/DUP-2 SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
4–8	S-2	3.8			0.0 / 0.0	
8–12	S-3	4.0		12.0'	0.0 / 0.0	
12–16	S-4	3.2		STIFF, REDDISH BROWN, CLAYEY SILT, DRY WATER ENCOUNTERED AT 14.9 FT BGS 14.9' VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 16.0'	0.0 / 0.0	V-1 (12.9' - 14.9') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

BOTTOM OF BORING AT 16.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. V-2

Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 12-5-03	
Location: WEST ELIZABETH, PA		Date Completed: 12-5-03	
...ing Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 19.5 FT BGS	
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-5-03 / 12:20	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4851.85 E 4101.43

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0 – 4.1'	–	–		VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY (4.1')	– / –	
4.1' – 5.6'	S-1	4.0		MEDIUM STIFF, DARK GRAY, CLAY SILT, DRY (5.6')	668	
5.6' – 16.0'	S-1, S-2, S-3	4.0, 4.0, 4.0		MEDIUM STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOTTLED, DRY (16.0')	1158 / 1072 / 185 / 45.7 / 373	
16.0' – 19.5'	S-4	3.7		SOFT, BROWN, CLAYEY SILT, MOIST (19.5')	91.3 / 345	V-2 (17.5' - 19.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
19.5' – 20.0'				VERY SOFT, BROWN, CLAYEY SILT, WET (20.0')		

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. V-3

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-1-03
Location: WEST ELIZABETH, PA	Date Completed: 12-5-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 17.0 FT BGS
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-5-03 / 14:05

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4909.45 E 4026.48

Surface Elev. ______

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (IN.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	2.9		VERY DENSE, BLACK TO GRAY, FILL MATERIAL, DRY (to 2.2')	0.0	V-3 (0.0' - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, MOTTLED, DRY (to 4.0')	0.0	
5	S-2	3.2		MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, MOIST	0.0	
					0.0	
	S-3	4.0			2.2	
10					200	
	S-4	4.0		(to 12.9')	32.5	
				SOFT, GRAY, CLAYEY SILT, MOIST		V-3 (15.0' - 17.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
15				(to 17.0')	13.2	
	S-5	3.8		VERY SOFT, GRAY, CLAYEY SILT, WET (to 17.4')	0.0	
				MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, DRY WATER ENCOUNTERED AT 17.0 FT BGS	0.0	
20				*BOTTOM OF BORING AT 20.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
35						
40						

LOG OF BORING NO. UP-1

CUMMINGS RITER CONSULTANTS, INC.

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-4-03
Location: WEST ELIZABETH, PA	Date Completed: 12-4-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 15.7 FT. BGS
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-4-03 / 13:55

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4301.35 E 3526.20
Surface Elev. ____

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (IN.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	4.0		VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY (to 1.6')	0.0	UP-1 (0.0 - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				STIFF, MOTTLED LIGHT GRAY TO REDDISH BROWN CLAYEY SILT WITH TRACE GRAVEL, DRY	0.0	
5	S-2	1.7			0.0	
				(to 8.0')	0.0	
	S-3	4.0		SOFT, REDDISH BROWN, CLAYEY SILT, MOIST	0.0	
10					0.0	
	S-4	3.7			0.0	UP-1 (13.7' - 15.7') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
15				WATER ENCOUNTERED AT 15.7 FT BGS	0.0	
	S-5	0.0			0.0	
				(to 20.0')	0.0	
20				*BOTTOM OF BORING AT 20.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
40						

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-2

Drilling Co. CHATFIELD DRILLING	Client: HERCULES INC.	Project No. 01305.40	
Driller: PAUL LORENO	Site Name: JEFFERSON PLANT	Date Started: 12-4-03	
	Location: WEST ELIZABETH, PA	Date Completed: 12-4-03	
	Field Geologist: CGK	Depth to GW: 15.5 FT. BGS	
	Checked By: CLN	Date/Time: 12-4-03 / 14:50	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4467.73 E 3648.87

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (IN.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0 – 4	S-1	3.7		LOOSE, BROWN, CLAYEY SILT WITH GRAVEL, MOIST	0.0 0.0	UP-2 (0.0 – 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
4 – 8	S-2	3.8		6.3' VERY SOFT, REDDISH BROWN, SANDY SILT WITH TRACE GRAVEL, MOIST 8.0'	0.0 0.0	
8 – 12	S-3	4.0		VERY SOFT, REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, MOIST TO WET WATER ENCOUNTERED AT 15.5 FT BGS	0.0 0.0	
12 – 16	S-4	4.0		16.0'	0.0 0.0	UP-2 (13.5' – 15.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

BOTTOM OF BORING AT 16.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-3

Client: HERCULES INC.
Project No. 01305.40
Site Name: JEFFERSON PLANT
Date Started: 12-4-03
Location: WEST ELIZABETH, PA
Date Completed: 12-4-03
Drilling Co. CHATFIELD DRILLING
Field Geologist: CGK
Depth to GW: 17.3 FT. BGS
Driller: PAUL LORENO
Checked By: CLN
Date/Time: 12-4-03 / 11:50
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4629.54 E 3690.16
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0				CONCRETE 1.0'	–	
	–	–		DENSE, REDDISH BROWN, FILL MATERIAL, DRY 4.5'	–	
5	S-1	2.6		VERY SOFT TO MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY TO MOIST	0.0	
					0.0	
	S-2	3.9			21.0	
10					81.8	
	S-3	4.0		PETROLEUM ODOR AT 12.0'	469	
15					517	UP-3 (15.3' – 17.3') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
	S-4	1.5		WATER ENCOUNTERED AT 17.3 FT BGS	32.1	
				20.0'	–	
20				*BOTTOM OF BORING AT 20.0'* BORING BACKFILLED WITH BENTONITE CHIPS		
25						
30						
40						

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-4

Client: HERCULES INC. | Project No. 01305.40
Site Name: JEFFERSON PLANT | Date Started: 12-4-03
Location: WEST ELIZABETH, PA | Date Completed: 12-4-03
Drilling Co. CHATFIELD DRILLING | Field Geologist: CGK | Depth to GW: 11.6 FT. BGS
Driller: PAUL LORENO | Checked By: CLN | Date/Time: 12-4-03 / 15:45
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4643.50 E 3857.60
Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0	S-1	3.2	Fill (crosshatch)	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, MOIST SHEEN AND PETROLEUM ODOR	19.7 52.2	UP-4 (0.0 - 2.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
5	S-2	3.7			56.7 60.4	
10	S-3	3.9		WATER ENCOUNTERED AT 11.6 FT BGS SHEEN APPARENT ON WATER 11.9'	26.9 18.0	UP-4 (9.6' - 11.6') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
				BOTTOM OF BORING AT 11.9' BORING BACKFILLED WITH BENTONITE CHIPS		
15						
20						
25						
30						
35						
40						

LOG OF BORING NO. UP-4R

CUMMINGS RITER CONSULTANTS, INC.

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-17-03
Location: WEST ELIZABETH, PA	Date Completed: 12-17-03
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK
Depth to GW: 12.0 FT. BGS	
Driller: PAUL LORENO	Checked By: CLN
Date/Time: 12-17-03 / 10:02	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4,643.50 E 3,857.60

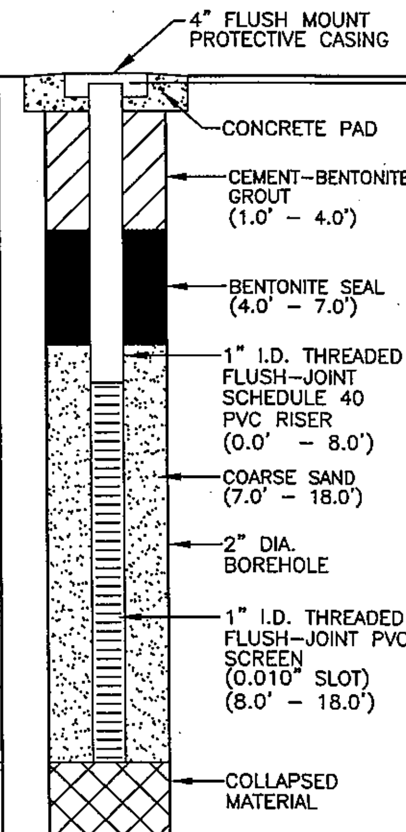
Surface Elev. 755.84'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)
0–4	S-1	3.2	VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY	19.7 / 52.2
4–8	S-2	3.7		56.7 / 60.4
8–12	S-3	3.9	11.7'	2.6 / 150
12–16	S-4	0.9	MEDIUM STIFF, GRAY AND BLACK, CLAYEY SILT WITH GRAVEL, MOIST, SHEEN; WATER ENCOUNTERED AT 12.0 FT. BGS. 12.0'; SOFT, BLACK, SANDY SILT WITH GRAVEL, WET, SHEEN, PETROLEUM ODOR 16.0'	120 / -
16–20	S-5	3.1	MEDIUM STIFF, DARK GRAY, CLAYEY SILT, MOIST 20.0'	20 / 0.0

BOTTOM OF BORING AT 20.0'

PIEZOMETER UP-4R INSTALLED WITH SCREEN SET FROM 8.0'-18.0' BGS

PIEZOMETER INSTALLATION DETAIL



ELEVATION (FT. M.S.L.)
755.84
755.37
750.00
740.00
735.84

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-5

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-11-03
Location: WEST ELIZABETH, PA	Date Completed: 12-11-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 8.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-11-03

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4781.17 E 3890.32

Surface Elev.

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0 – 2.1'	S-1	3.9		VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY (2.1')	0.0	UP-5 (0.0 – 2.0') MS/MSD SAMPLE COLLECTED AND ANALYZED FOR LABORATORY ANALYSIS
2.1' – 5.2'				DENSE TO VERY DENSE, DARK GRAY, FILL MATERIAL, MOIST (5.2')	0.0	
5.2' – 8.0'	S-2	3.5		VERY STIFF, DARK BROWN AND DARK GRAY, CLAYEY SILT WITH SAND AND GRAVEL, DRY WATER ENCOUNTERED AT 8.0 FT. BGS. (8.0')	0.0 0.0	
8.0' – 12.0'	S-3	3.1		STIFF TO VERY STIFF, DARK BROWN AND DARK GRAY, CLAYEY SILT WITH GRAVEL, WET (12.0')	0.0 190	UP-5 (6.0'– 8.0') SAMPLE COLLECTED AND ANALYZED FOR LABORATORY ANALYSIS

BOTTOM OF BORING AT 12.0'

BORING BACKFILLED WITH BENTONITE CHIPS

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-6

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-12-03
Location: WEST ELIZABETH, PA	Date Completed: 12-16-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 12.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-12-03 / 10:08

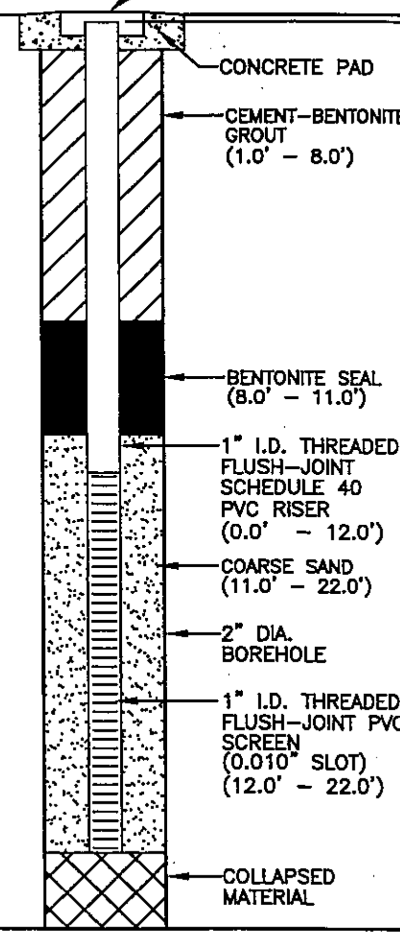
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4,886.71 E 4,222.41

Surface Elev. 755.90'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	ELEVATION (FT. M.S.L.)
0	–	–	ASPHALT 1.4'	–	755.90 / 755.67
			VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 3.3'	–	
			VERY STIFF, REDDISH BROWN, CLAYEY SILT, TRACE GRAVEL, DRY 4.0'		
5	S-1	3.9	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT, TRACE SAND, MOIST	0 / 20	750.00
10	S-2	4.0	12.0'	20 / 42	
	S-3	0.0	WATER ENCOUNTERED AT 12.0 FT. BGS. NO RECOVERY 16.0'	– / –	
15	S-4	4.0	SOFT, REDDISH BROWN, CLAYEY SILT, TRACE SAND, MOIST 18.5'	131	740.00
			VERY SOFT, GRAY, SANDY SILT, MOIST FREE PRODUCT APPARENT 20.0'	495	
20	S-5	2.1	VERY SOFT, GRAY, CLAYEY SILT, TRACE SAND, MOIST 24.0'	500 / –	731.90
25			*BOTTOM OF BORING AT 24.0'* PIEZOMETER UP-6 INSTALLED WITH SCREEN SET FROM 12.0'-22.0' BGS		
30					
40					

PIEZOMETER INSTALLATION DETAIL



UP-6 (10.0' - 12.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

LOG OF BORING NO. UP-7

CUMMINGS RITER CONSULTANTS, INC.

Client: HERCULES INC.	Project No. 01305.40
Site Name: JEFFERSON PLANT	Date Started: 12-11-03
Location: WEST ELIZABETH, PA	Date Completed: 12-16-03
Drilling Co. CHATFIELD DRILLING / Field Geologist: CGK	Depth to GW: 14.0 FT. BGS
Driller: PAUL LORENO / Checked By: CLN	Date/Time: 12-11-03 / 12:05

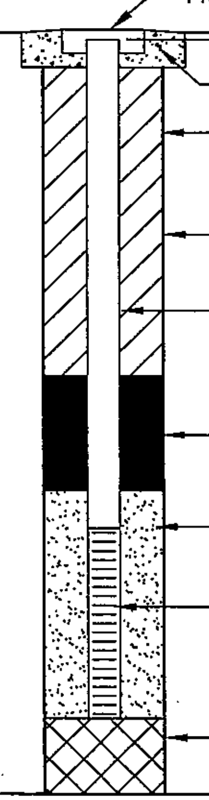
Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 4,944.73 E 5,146.96

Surface Elev. 742.96

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)
0	–	–	CONCRETE 0.8'	–
			ASPHALT 1.2'	
			VERY DENSE, GRAY TO BLACK, FILL MATERIAL, DRY 2.8'	–
			VERY STIFF, LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT, MOTTLED, DRY	
5	S-1	4.0		0.0
			8.0'	0.0
	S-2	3.7	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, DRY	0.0
10			12.0'	0.0
	S-3	4.0	SOFT, REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, MOIST WATER ENCOUNTERED AT 14.0 FT. BGS. 14.0'	0.0
15			SOFT, REDDISH BROWN, CLAYEY SILT, MOIST 16.0'	0.0
	S-4	2.1	VERY SOFT REDDISH BROWN, CLAYEY SILT, WET 17.1'	0.0
			SOFT, REDDISH BROWN, CLAYEY SILT, MOIST 20.0'	0.0
20			*BOTTOM OF BORING AT 20.0'* PIEZOMETER UP-7 INSTALLED WITH SCREEN SET FROM 13.0'-18.0' BGS	
25				
30				
35				
40				

PIEZOMETER INSTALLATION DETAIL



ELEVATION (FT. M.S.L.)
742.96
742.65
740.00
730.00
722.96

UP-7 (14.0' - 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-8

Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 12-12-03	
Location: WEST ELIZABETH, PA		Date Completed: 12-12-03	
...ing Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 16.0 FT. BGS	
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-12-03 / 11:15	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5,042.99 E 4,385.32

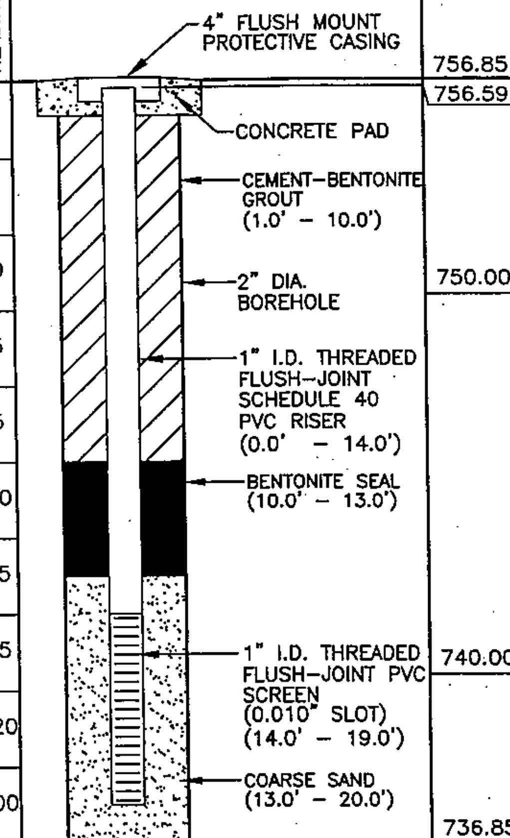
Surface Elev. 756.85'

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	PROFILE	DESCRIPTION	HEADSPACE PID READING (PPM)
0–4.0	-	-		LOOSE, GRAY TO BLACK, FILL MATERIAL, MOIST 4.0'	- / -
4.0–8.0	S-1	4.0		STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, DRY 8.0'	0.0 / 1.5
8.0–12.0	S-2	3.8		MEDIUM STIFF, MOTTLED LIGHT GRAY AND REDDISH BROWN CLAYEY SILT WITH TRACE SAND, DRY 12.0'	1.5 / 15.0
12.0–16.0	S-3	3.7		SOFT, REDDISH BROWN, SANDY SILT, MOIST, PETROLEUM ODOR WATER ENCOUNTERED AT 16.0 FT. BGS. 16.0'	325 / 325
16.0–20.0	S-4	3.3		VERY SOFT, REDDISH BROWN, CLAYEY SILT, WET 17.7' VERY SOFT, GRAY AND BROWN, SANDY SILT, WET 18.2' SOFT, REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, MOIST 20.0'	1220 / 1600

BOTTOM OF BORING AT 20.0'

PIEZOMETER UP-8 INSTALLED WITH SCREEN SET FROM 14.0'-19.0' BGS

PIEZOMETER INSTALLATION DETAIL



UP-8 (14.0' - 16.0') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS

CUMMINGS RITER CONSULTANTS, INC.

LOG OF BORING NO. UP-9

Client: HERCULES INC.		Project No. 01305.40	
Site Name: JEFFERSON PLANT		Date Started: 12-5-03	
Location: WEST ELIZABETH, PA		Date Completed: 12-5-03	
Drilling Co. CHATFIELD DRILLING	Field Geologist: CGK	Depth to GW: 18.5 FT. BGS	
Driller: PAUL LORENO	Checked By: CLN	Date/Time: 12-5-03 / 15:25	

Drilling Method: GEOPROBE WITH 2.0-INCH MACROCORE SAMPLER AND ACETATE LINERS

Coordinates N 5255.53 E 4677.78
Surface Elev. ______

DEPTH (FEET)	SAMPLE NO. AND TYPE	SAMPLE RECOVERY (FT.)	DESCRIPTION	HEADSPACE PID READING (PPM)	REMARKS
0–4	–	–	MEDIUM STIFF, MOTTLED LIGHT GRAY TO REDDISH BROWN, CLAYEY SILT WITH TRACE GRAVEL, DRY	–, –	
4–8	S-1	4.0		0.0, 0.0	
8–12	S-2	4.0	12.0'	0.0, 0.0	
12–16	S-3	4.0	MEDIUM STIFF, REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, DRY	0.0, 0.0	
16–20	S-4	3.4	18.5'	0.0	UP-9 (16.5' – 18.5') SAMPLE COLLECTED AND SENT FOR LABORATORY ANALYSIS
			VERY SOFT, REDDISH BROWN, CLAYEY SILT WITH TRACE SAND, WET WATER ENCOUNTERED AT 18.5 FT BGS 20.0'	0.0	

BOTTOM OF BORING AT 20.0'

BORING BACKFILLED WITH BENTONITE CHIPS

CUMMINGS
RITER
CONSULTANTS, INC.

VOLUME II OF II

REPORT
REMEDIAL INVESTIGATION
HERCULES INCORPORATED
JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR:
HERCULES INCORPORATED
HERCULES RESEARCH CENTER - BUILDING 8139/15
500 HERCULES ROAD
WILMINGTON, DELAWARE 19808-1599

PREPARED BY:
CUMMINGS/RITER CONSULTANTS, INC.
10 DUFF ROAD, SUITE 500
PITTSBURGH, PA 15235

PROJECT NO. 01305.40/11
AUGUST 16, 2004

APPENDIX B

CULVERT INVESTIGATION LETTER REPORT

CUMMINGS RITER

CUMMINGS RITER CONSULTANTS, INC.

LETTER REPORT
CULVERT VIDEO INSPECTION AND CLEANING
FORMER HERCULES JEFFERSON PLANT
JEFFERSON BOROUGH, PENNSYLVANIA

PREPARED FOR:
HERCULES INCORPORATED
RESEARCH CENTER
BUILDING 8139/14
500 HERCULES ROAD
WILMINGTON, DE 19808-1599

PREPARED BY:
CUMMINGS/RITER CONSULTANTS, INC.
10 DUFF ROAD, SUITE 500
PITTSBURGH, PA 15235

PROJECT NO. 01305.40/01
JANUARY 27, 2004

CUMMINGS
RITER
CONSULTANTS, INC.

January 27, 2004
Project No. 01305.40/01

Mr. Joseph Keller
Hercules Incorporated
Research Center
Building 8139/14
500 Hercules Road
Wilmington, DE 19808-1599

**RE: LETTER REPORT - CULVERT VIDEO INSPECTION AND CLEANING
FORMER HERCULES JEFFERSON PLANT
JEFFERSON BOROUGH, PENNSYLVANIA**

Dear Mr. Keller:

Cummings/Riter Consultants, Inc. (Cummings/Riter) is submitting this report to summarize the activities that took place November 13, 14, and 18, 2003 during culvert video inspection and cleaning of a 36-inch and a 24-inch reinforced concrete pipe storm sewer at the former Hercules Jefferson plant (now owned and operated by Eastman Chemical [Eastman]) located in Jefferson Borough, Pennsylvania. The video inspection for both the 36-inch and 24-inch pipes began along State Route 837, ran underneath the upper plant area, and terminated in Jorgys Pond located on the plant property. Eastman provided air monitoring and cleared all work areas daily, prior to work activities. Eastman required that all equipment be removed from the plant at the end of each day.

The following paragraphs provide a detailed summary of video inspection and cleaning activities, the condition of the 36-inch and 24-inch pipes before and after cleaning, as well as general observations.

GENERAL TIMELINE

On November 13, 2003, Robinson Pipe Cleaning Company (RPC) arrived on site and began work on exposing the ends of the 36-inch and 24-inch reinforced concrete pipes at the retention pond. The end of the 36-inch pipe, at the retention pond, was partially obstructed by rip-rap and gravel which was removed and placed on plastic located on the bank of the retention pond. The 24-inch pipe was completely obstructed by the rip-rap and gravel. The rip-rap and gravel on the west bank was placed to reinforce a railroad tie wall located above the west bank of the retention pond. Rip-rap and gravel were removed only enough to expose the ends of the pipes using a Case 580 Super K Extend-a-hoe. Eastman approved all rip-rap and gravel removal and replacement. All material removed from the retention pond was staged on plastic located on the east bank of the retention pond.

10 Duff Road • Suite 500 • Pittsburgh, PA 15235
(412) 241-4500 • FAX (412) 241-7500 • E-Mail: crc@cummingsriter.com

RPC constructed a dike between the ends of the 36-inch and 24-inch pipes and the gooseneck discharge outlet using formerly dredged material from the east bank of the retention pond.

Water discharging from the 36-inch and 24-inch pipes was pumped over the dike using a gas powered pump. The dike was created to capture material discharged from the 36-inch and 24-inch pipes during pipe cleaning activities.

Prior to videotaping the pipes, the water level in the pipes was lowered to facilitate videotaping. Since it was determined that the gas-powered pump was not lowering the water level quick enough, RPC acquired a 900-gallon per minute hydraulic pump and began pumping water at a quicker rate. Once the water level in the retention pond was reduced to a level below the pipe, the 36-inch pipe was videotaped, starting at the headwall located on the west side of State Route 837 near the tank farm. Sediment and debris were observed in the lower end of the 36-inch pipe at about 159 feet, and it was determined that the 36-inch pipe was in need of cleaning.

From the retention pond outlet, a high-pressure water jet was used to clean and pull material out of the 36-inch pipe and into the isolated portion of the retention pond. The 36-inch pipe was then re-videotaped for the post-cleaning condition. Some debris and sediment still remained in the 36-inch pipe. RPC determined that a stronger nozzle was necessary to remove the remaining sediment and debris from the 36-inch pipe.

The videotape of the 24-inch pipe began at a culvert located on the east side of State Route 837. At approximately 212 feet from the culvert, sediment and debris obstructed the pipe, and the videotape was discontinued.

On November 14, 2003, RPC built up the dike with sandbags and pumped water out of the isolated portion of the retention pond. RPC re-cleaned the 36-inch pipe with the larger jet head and continued with the post-cleaning video. At approximately 220 feet from the inlet at State Route 837, debris and sediment were still observed in the pipe. RPC discontinued the video and re-cleaned the 36-inch pipe. After the 36-inch pipe was re-cleaned, RPC completed the post-cleaning videotape of the 36-inch pipe.

A few large rocks remained in front of and above the 24-inch pipe end at the retention pond. RPC felt that, in order to gain access to the 24-inch pipe for cleaning, the rocks must be removed. RPC was unable to schedule a backhoe operator for work that day. The sandbags were removed from the dike and site activities were discontinued for the day.

On November 18, 2003, the dike was built up with formerly dredged material located on the east bank of the retention pond, and the remaining rocks were removed from in front of and above the 24-inch pipe with a trackhoe. RPC cleaned the 24-inch pipe with the water jet. Periodically, cleaning was discontinued so that accumulated sediment from the

24-inch pipe could be excavated from the retention pond. All material removed from the retention pond was placed on the plastic located on the east bank to allow water to drain from the material back into the retention pond.

Once the 24-inch pipe was cleaned, RPC videotaped the post-cleaning condition of the 24-inch pipe. During cleaning of the 24-inch pipe, some sediment and debris from the 24-inch pipe backed up into the 36-inch pipe. RPC re-cleaned approximately 50 feet of the 36-inch pipe. Once cleaning was complete, RPC removed all equipment from the retention pond, replaced the rip-rap and gravel removed from the west bank of the retention pond with the trackhoe, and removed the dike and some sediment from the retention pond. Eastman approved the rip-rap and gravel replacement as well as the current condition of Jorgys Pond.

A copy of RPC's daily work orders is included in Attachment A.

VIDEO FINDINGS: 36-INCH PIPE

In general, the 36-inch pipe is functional, seems to be in good condition, and is 398 feet in length. Pipe sections were measured to be 4 feet long. The joints between pipes seemed relatively tight with the exception of the last two sections of pipe before the 36-inch pipe ends at the retention pond, where a gap of approximately 1 to 3 inches was observed. Multiple seeps from joints were also observed. At around 180 feet from the 36-inch pipe's inlet at State Route 837, a sag of approximately 20 percent begins and ends at approximately 218 feet.

Three pipes tap into the 36-inch pipe. Two of the tap-ins enter at a service point approximately 96 feet from the 36-inch pipe's inlet. At the service point, one tap-in is located at the 9 o'clock position, and the other tap-in is located at the 3 o'clock position. The third tap-in occurs at a service point at approximately 115.6 feet from the inlet. The 36-inch pipe makes two noticeable bends: one bend to the left at approximately 96 feet from the pipe inlet, and one bend (also to the left) at approximately 115 feet from the 36-inch pipe's inlet. The walls of the 36-inch pipe were stained from approximately 165 feet from the pipe inlet to the outlet at the retention pond.

During the pre-cleaning videotape, multiple points with infiltration, deposits, and encrustation were observed. From 96 feet to approximately 106 feet from the pipe inlet, calcium deposits were observed. Multiple joints with and without infiltration were also encrusted. At 131 feet, a substantial amount of infiltration was observed ("gusher") at the 2 to 3 o'clock position. At 204 feet, infiltration dripping into the pipe beaded up when it ran down the side of the pipe; this suggests that this infiltrating water has an oily nature.

The net increase of flow into the 36-inch pipe from the pipe's inlet to the pipe's outlet at the retention pond was estimated to be approximately 250 percent.

Pre-cleaning and post-cleaning logs and videotapes are included in Attachment B.

VIDEO FINDINGS: 24-INCH PIPE

As with the 36-inch pipe, the 24-inch pipe is also functional and seems to be in good condition. The total length of the 24-inch pipe is 270 feet. Pipe sections were measured at 4 feet and the joints between pipes seemed relatively tight with an exception to the last two sections of pipe before the 24-inch pipe ends at the retention pond, where a gap of approximately 1 to 2 inches was observed. Seeps from joints were also observed along with some deposits and encrustations. The walls of the pipe had some staining beginning at 190 feet. The 24-inch pipe had one bend, to the left, at 184 feet from the culvert located on the east side of State Route 837.

Two pipe tap-ins on the 24-inch pipe were observed. One tap-in is located at approximately 32 feet at 12 o'clock, and another is located at approximately 51 feet at 4 o'clock. At approximately 151 feet, from the culvert located on the east side of State Route 837, a hole is located at 12 o'clock. This hole has rebar protruding from the end into the pipe. While the video equipment was being pulled out of the 24-inch pipe after the post-cleaning video was completed, a hole was discovered at the 6 o'clock position at approximately the same location. The circular nature of the hole and the orientation (one on top and one in the bottom) suggest that these holes could possibly have been made during previous drilling operations at the site.

A hole in the 24-inch pipe at 254 feet, from 3 o'clock to 4 o'clock, contains moderate encrustation. In the post-cleaning video, a brown light non-aqueous phase liquid (LNAPL) was observed in the joint at approximately 245 feet from the culvert located on the east side of State Route 837. Also at this joint, scum on the water flowing through the 24-inch pipe was visible and remained relatively stationary in an eddy.

No water was observed entering the 24-inch pipe prior to an unrelated plant incident. Therefore, net increase in flow estimations was not performed for the 24-inch pipe.

Pre-cleaning and post-cleaning logs and videotapes are included in Attachment B.

GENERAL OBSERVATIONS

On November 13, 2003, an organic sheen on the water of the retention pond was observed prior to culvert cleaning and videotaping activities. When the water in the isolated portion of the retention basin was pumped low enough so that water could drain from the 24-inch pipe, a brown LNAPL was seen flowing out of the 24-inch pipe. An organic sheen on the water flowing from the 36-inch pipe was also visible. After the 36-inch pipe was cleaned an organic sheen on the water flowing from the 36-inch pipe was still visible. The organic sheen remained on the water flowing from both the 36-inch and 24-inch pipes throughout the culvert cleaning and videotaping activities even though the sheen was not observed during videotaping.

On November 14, 2003, two seeps were observed originating from the west bank of the retention basin. One seep was observed on the right side of the 36-inch pipe coming from above the 36-inch pipe. The other seep originated from the west bank above and to the right of the 24-inch pipe. The seeps continued to flow throughout activities at the retention pond. On November 18, 2003, the seep adjacent to the 24-inch pipe had a noticeable organic sheen on the water.

During cleaning of the 24-inch pipe, the material removed from the 24-inch pipe was black, sludge like, and had a strong organic odor and sheen. Some brown LNAPL was also cleaned out of the 24-inch pipe. The lower portion of both pipes had discoloration on the walls either from impounded water and sediment, LNAPL, or both.

Pictures taken during culvert cleaning and videotaping activities are included in Attachment C.

CLOSING

Approximately 240 feet of 36-inch and 68 feet of 24-inch pipe were cleaned by RPC.

The videotaping revealed several previously unknown tap-ins to the 24-inch and 36-inch pipes as well as significant infiltration of groundwater. Field observations confirmed the presence of a sheen on the water flowing out of the culvert after cleaning. Figure 1 notes the approximate location of the pipes, tap-ins, and the impacted groundwater areas, as defined by MTR. The pipes' proximity to groundwater and LNAPL areas should be reassessed after the current groundwater investigation is completed. In addition, it would be beneficial to survey the pipe inverts at the inlet, outlet, and other access points to approximate the pipe slope. This slope could be used to estimate the pipe elevation at various points along the pipe and compare it to groundwater elevations. This report completes our current scope for the project.

Cummings/Riter appreciates the opportunity to assist Hercules Incorporated on this project. If you have any questions or are in need of further assistance, please call me at (412) 241-4500.

Sincerely,
Cummings/Riter Consultants, Inc.

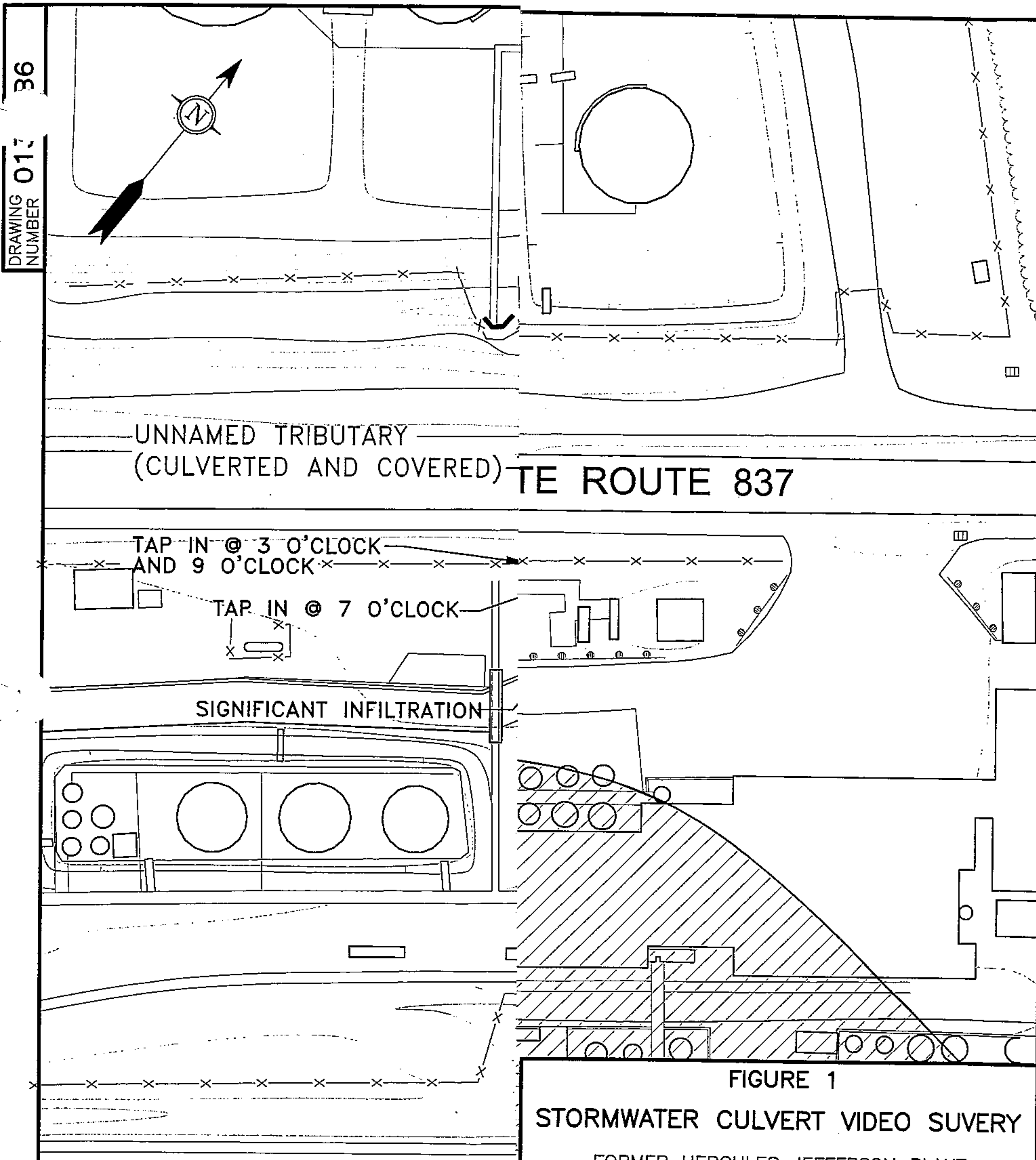
William C. Smith, P.E.
Senior Project Manager

CRY/WCS/cld
Attachments

pc: Mr. William Hendon - Eastman Company

CUMMINGS RITER

FIGURE



LEGEND:

- APPROXIMATE PROBABLE MAXIMUM EXTENT DISSOLVED PHASE AROMATIC CONSTITUENTS OF INTEREST EXCEEDING PADEP MSC
- APPROXIMATE PROBABLE MAXIMUM LATERAL EXTENT OF LNAPL BASED ON LNAPL MEASUREMENTS MADE IN DECEMBER 2001

REFERENCE:
DOCC DRAWING NUMBER 01005011 BY MTR DATED

PLOT SCALE: 1

FIGURE 1

STORMWATER CULVERT VIDEO SUVERY

FORMER HERCULES JEFFERSON PLANT
WEST ELIZABETH, PENNSYLVANIA

PREPARED FOR
HERCULES INCORPORATED
WILMINGTON, DELAWARE

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER
01305B6

DRAWN BY: T.E. McKee	DATE: 1-8-04
CHECKED BY: WCS	DATE: 1-8-04
APPROVED BY: WCS	DATE: 1-8-04

ATTACHMENT A

ROBINSON PIPE CLEANING COMPANY
DAILY WORK ORDERS

ROBINSON PIPE CLEANING CO.
WORK ORDER

SHEET # ______ OF ______

PO #4500748744

(005800)

DATE: 11-18-03

START: 7:30 AM | FINISH: 4:30 PM

WORK FOR: HERCULES, INC.
RS10/20/03kb

JOB NO.: 3434

PHONE: 412-995-3407

JOB LOCATION: West Elizabeth, PA

REPORT TO: Joe Keller

TIME TO REPORT: ASAP

WORK TO BE DONE: TV AND CLEAN LINES

EQUIPMENT REQUIRED JETTER COMBO * TV TRUCK
2 MEN

SET-UP NO. 1
- ☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder
- ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker
- ☐ T.V. ☐ Winches ☐ Dry/Wet Vac
- Diam.

ON

FROM ____ TO ____

☐ CLEANED ☐ TV

FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO.
- ☐ Jetter Hydro Vac/Jet Rodder
- ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker
- ☐ T.V. ☐ Winches ☐ Dry/Wet Vac
- Diam.

ON

FROM ____ TO ____

☐ CLEANED ☐ TV

FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO. 3
- ☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder
- ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker
- ☐ T.V. ☐ Winches ☐ Dry/Wet Vac
- Diam.

ON

FROM ____ TO ____

☐ CLEANED ☐ TV

FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO. 4
- ☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder
- ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker
- ☐ T.V. ☐ Winches ☐ Dry/Wet Vac
- Diam.

ON

FROM ____ TO ____

☐ ☐ TV

FOOTAGE (Circle if incomplete)

REMARKS

11-13-03

TOTAL FT. CLEANED: ________ TOTAL FT. TELEVISED: ________

Unit No. ______
Winch No. ______
Truck No. 244
Jetter No. ______

Vac No. ______
Hydro No. ______
Pump HYD
TV Trk. No. KL

Tanker No. ______
Vac/Jet Rodder No. 150
Other: ______

	HOURS WORKED Shop	Job	Travel	TOTAL	BILLING
B. Morris	½	9	1½		
J Goodwin	½	9	1½		
R Bennett	½	9	1½		

REMARKS: Check Trucks out
Drove to Job Had Safety Training
Set Pumps up T.V. and
Cleans Various Lines
Also went to Clairton to
Pick up Hyd Pump

STOVE CLEANING REPORT

FURNACE NO:	STOVE NO:	COILS OF ROD OPENED:

NO. FLUES ATTEMPTED — Opened: / Unopened:

REMARKS: Job Incomplete

Footage is correct. Work and hours indicated above are satisfactory.
Work performed, debris removal and dump location arranged by customer:

CUSTOMER SIGNATURE: [signature]

JOB FOREMAN: [signature]

ROBINSON PIPE CLEANING CO.
WORK ORDER

SHEET # ______ OF ______

START: 7:30 AM　FINISH: 2:00 PM

P.O.# 4500748744
(005800)

DATE: 11-14-03

WORK FOR: HERCULES INC　JOB NO: 3734-1　PHONE: 302-995-3407

JOB LOCATION: WEST ELIZABETH PA

REPORT TO: JOE KELLER　TIME TO REPORT:

WORK TO BE DONE: CLEAN + T.V.

EQUIPMENT REQUIRED

Unit No.		Vac No.		Tanker No.	
Winch No.		Hydro No.		Vac/Jet Rodder No.	150
Truck No.	242	Pump	HYD	Other:	
Jetter No.		TV Trk. No.	56		

SET-UP NO. 1
☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac　Diam.

ON

FROM　TO

☐ CLEANED　☐ TV　FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO.
☐ Jetter ☐ Hydro Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac　Diam.

ON

FROM　TO

☐ CLEANED　☐ TV　FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO. 3
☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac　Diam.

ON

FROM　TO

☐ CLEANED　☐ TV　FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO. 4
☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac　Diam.

ON

FROM　TO

D　☐ TV　FOOTAGE (Circle if incomplete)

REMARKS

TOTAL FT. CLEANED: ______　TOTAL FT. TELEVISED: ______

	HOURS WORKED Shop	Job	Travel	TOTAL	BILLING
B. MORRIS	1/4	6 1/2			
J Goodwin	1/4	6 1/2			
R. BENNETT	1/4	6 1/2			

REMARKS: CHECKS TRUCKS OUT SET UP PUMP CLEAN + TV VARIOUS LINES GAVE REPORTS TO
x8150　Job In Complete

STOVE CLEANING REPORT

FURNACE NO:　STOVE NO:　COILS OF ROD OPENED:

NO. FLUES ATTEMPTED　Opened:　Unopened:

REMARKS:

Footage is correct. Work and hours indicated above are satisfactory. Work performed, debris removal and dump location arranged by customer:

CUSTOMER SIGNATURE: [signature]

JOB FOREMAN: Bill Morris

ROBINSON PIPE CLEANING CO.
WORK ORDER

SHEET # ______ OF ______

START: 7:30 AM | FINISH: 3:00 PM

005800

DATE: 11-18-03

WORK FOR: HERCULES INC JOB NO: 3734-1 PHONE:

JOB LOCATION: WEST ELIZABETH

REPORT TO: TIME TO REPORT:

WORK TO BE DONE: CLEAN + T.V.

EQUIPMENT REQUIRED

SET-UP NO. 1

☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac Diam.

ON

FROM TO

☐ CLEANED ☐ TV FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO.

☐ Jetter ☐ Hydro Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac Diam.

ON

FROM TO

☐ CLEANED ☐ TV FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO. 3

☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac Diam.

ON

FROM TO

☐ CLEANED ☐ TV FOOTAGE (Circle if incomplete)

REMARKS

SET-UP NO. 4

☐ Jetter ☐ Hydro ☐ Vac/Jet Rodder ☐ Power Rodder ☐ Small Rodder ☐ Vacuum Tanker ☐ T.V. ☐ Winches ☐ Dry/Wet Vac Diam.

ON

FROM TO

D ☐ TV FOOTAGE (Circle if incomplete)

REMARKS

TOTAL FT. CLEANED: ______ TOTAL FT. TELEVISED: ______

Unit No. ______ Vac No. ______ Tanker No. ______
Winch No. ______ Hydro No. ~~[illegible]~~ Vac/Jet Rodder No. 181
Truck No. T-243 Pump HYD Other: ______
Jetter No. ______ TV Trk. No. 56

	HOURS WORKED Shop	Job	Travel	TOTAL	BILLING
B. MORRIS	1/4	7 1/2	1 1/2		
C HILL	1/4	7 1/2	1 1/2		
R BENNETT	1/4	7 1/2	1 1/2		

REMARKS: CHECK TRUCKS OUT SET UP PUMP PUMP WATER DOWN CLEAN 24" LINE AND T.V. VARIOUS LINES ALSO GAVE TAPES + REPORTS TO Job COMPLETE

STOVE CLEANING REPORT

FURNACE NO: STOVE NO: COILS OF ROD OPENED:

NO. FLUES ATTEMPTED Opened: Unopened:

REMARKS: Milage

T.V. 56 Shop 115931 JC-181 Shop 13402
Job 115952 Job 13423
T-243 Shop 155540
Job 155562

Footage is correct. Work and hours indicated above are satisfactory. Work performed, debris removal and dump location arranged by customer:

CUSTOMER SIGNATURE: [signature]

JOB FOREMAN: Bill Morris

ATTACHMENT B

PRE-CLEANING AND POST-CLEANING LOGS AND VIDEOTAPES

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax: (724) 228-5624

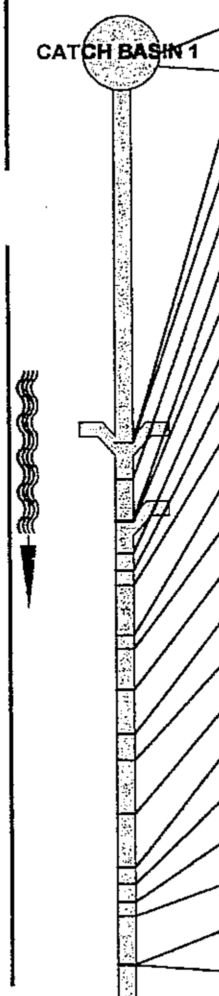
Inspection report

Date: 20031113	P.O.#	Weather: 5 Wet	Surveyor/Cert #: B MORRIS U-030-250	Section Number: 1	PSR:
Tot Pipe Length:	Survey Customer: HERCULES INC	System Owner: EASTMAN CHEM	Clean Date:	Pre-Cleaned: N No pre-cleaning	Rate:

Street: RT 837	Flow Control:	MH: CATCH BASIN 1
City: WEST ELIZABETH	Year Renewed	MH: POND
Location Code: C Light highway	Tape/Media #: BM 1	Length Surveyed: 323.2 ft

Reason for inspection: B Infiltration and Inflow investigation	Dia/Ht: C Circular 36"
Use: SW Storm Water	Material: CP Concrete pipe (non-reinforced) Pipe Jt
Drainage Area:	Lining Material:
	: Enter Z if unknown

Comments:



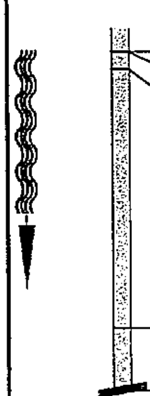
1:561	position	code	observation	grade	counter	photo
	3.00	AMH	access points, manhole, Comments: Upstream MH	1	00:00:51	
	3.00	MWL	miscellaneous. water level. 5 %		00:01:05	
	96.00	TBA	tap break-in/hammer, active at 09 o'clock	2	00:06:11	3a
	96.00	TBA	tap break-in/hammer, active at 03 o'clock	2	00:07:01	4a
	105.10	DA	deposits attached from 05 to 06 o'clock		00:09:56	
	115.20	DAE	deposit attached, encrustation, < 20% from 05 to 06 o'clock	3	00:12:13	6a
	115.60	TBA	tap break-in/hammer, active at 07 o'clock	2	00:13:25	7a
	123.40	IR	infiltration, runner from 03 to 04 o'clock	4	00:15:02	8a
	127.60	IR	infiltration, runner from 02 to 03 o'clock	4	00:16:02	9a
	131.00	IG	infiltration, gusher from 02 to 03 o'clock	5	00:17:17	10a
	143.40	IW	infiltration. weeper from 12 to 01 o'clock	2	00:19:21	
	146.70	MWL	miscellaneous, water level PONDERING		00:20:06	12a
	156.70	IW	infiltration weeper from 12 to 01 o'clock	2	00:21:21	
	167.50	ID	infiltration, dripper from 02 to 03 o'clock	3	00:22:41	14a
	173.90	ID	infiltration, dripper from 12 to 01 o'clock	3	00:24:17	15a
	186.90	ID	infiltration, dripper from 12 to 01 o'clock	3	00:26:30	
	200.00	IR	infiltration, runner from 04 to 05 o'clock	4	00:27:45	17a
	204.20	ID	infiltration, dripper from 04 to 05 o'clock	3	00:29:01	18a
	208.50	IW	infiltration weeper from 03 to 04 o clock	2	00:30:25	
	212.00	IR	infiltration, runner from 03 to 04 o'clock	4	00:31:18	20a
	223.80	ID	infiltration, dripper from 12 to 01 o'clock	3	00:32:51	
	224.00	IW	infiltration, weeper from 07 to 08 o clock	2	00:33:33	
	233.00	IW	infiltration, weeper from 03 to 04 o'clock	2	00:34:35	

The Environmental
Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

Inspection report

Date: 20031113	P.O.#	Weather: 5 Wet	Surveyor/Cert #: B MORRIS U-030-250	Section Number: 1	PSR:
Tot Pipe Length:	Survey Customer: HERCULES INC	System Owner: EASTMAN CHEM	Clean Date:	Pre-Cleaned: N No pre-cleaning	Rate:



1:561	position	code	observation	grade	counter	photo
	240.30	IR	infiltration, runner from 07 to 08 o´clock	4	00:35:49	24a
	240.30	IR	infiltration, runner from 04 to 05 o´clock	4	00:36:26	25a
	244.70	IR	infiltration, runner from 04 to 05 o´clock	4	00:37:13	26a
	308.00	IW	infiltration, weeper from 07 to 08 o´clock	2	00:41:01	
	323.20	MSA	miscellaneous, survey abandoned WATER & MATERIAL		00:43:10	28a

The Environmental Protection Specialists

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519 and Rainey Road
Eighty Four, PA 15330
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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031113	1	

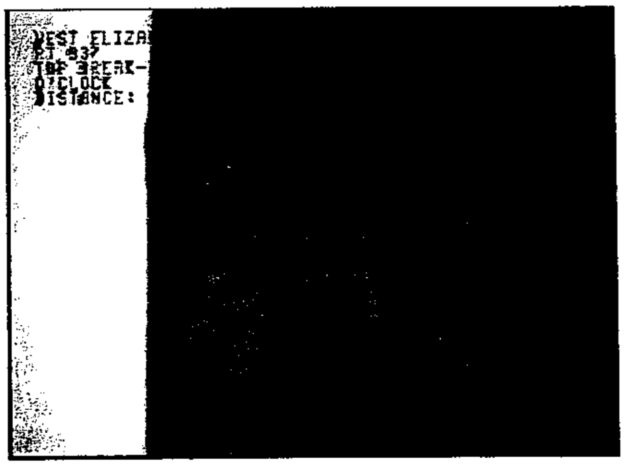

Photo: 3a, Tape No.: BM 1, 00:06:11
96FT, tap break-in/hammer, active at 09 o´clock

Photo: 4a, Tape No.: BM 1, 00:07:01
96FT, tap break-in/hammer, active at 03 o´clock

Photo: 6a, Tape No.: BM 1, 00:12:13
115.2FT, deposit attached, encrustation, < 20% from 05 to 06 o´clock

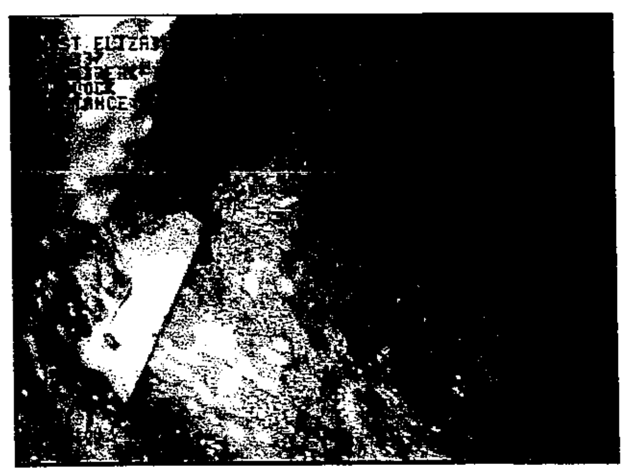

Photo: 7a, Tape No.: BM 1, 00:13:25
115.6FT, tap break-in/hammer, active at 07 o´clock

The Environmental
Protection Specialists

Robinson Pipe Cleaning Co.
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Eighty Four, PA 15330
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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031113	1	

Photo: 8a, Tape No.: BM 1, 00:15:02
123.4FT, infiltration, runner from 03 to 04 o´clock

Photo: 9a, Tape No.: BM 1, 00:16:02
127.6FT, infiltration, runner from 02 to 03 o´clock

Photo: 10a, Tape No.: BM 1, 00:17:17
131FT, infiltration, gusher from 02 to 03 o´clock

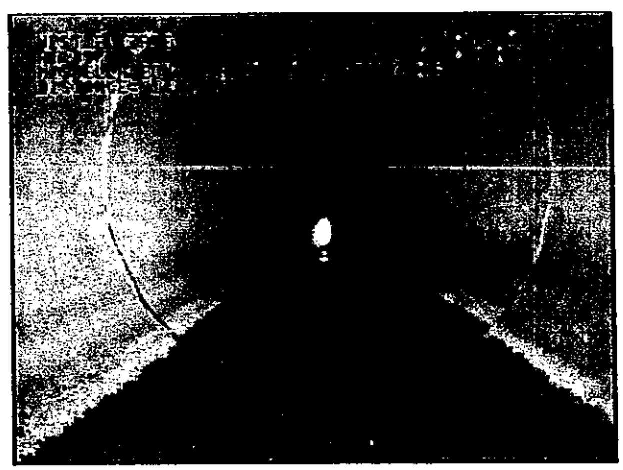

Photo: 12a, Tape No.: BM 1, 00:20:06
146.7FT, miscellaneous, water level PONDERING

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
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Eighty Four, PA 15330
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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031113	1	

Photo: 14a, Tape No.: BM 1, 00:22:41
167.5FT, infiltration, dripper from 02 to 03 o´clock

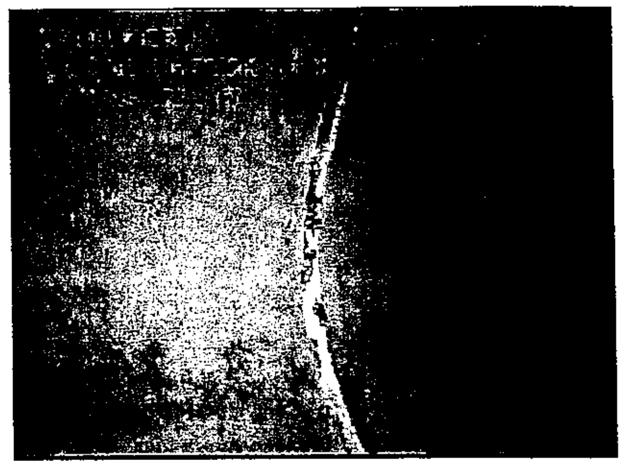

Photo: 15a, Tape No.: BM 1, 00:24:17
173.9FT, infiltration, dripper from 12 to 01 o´clock

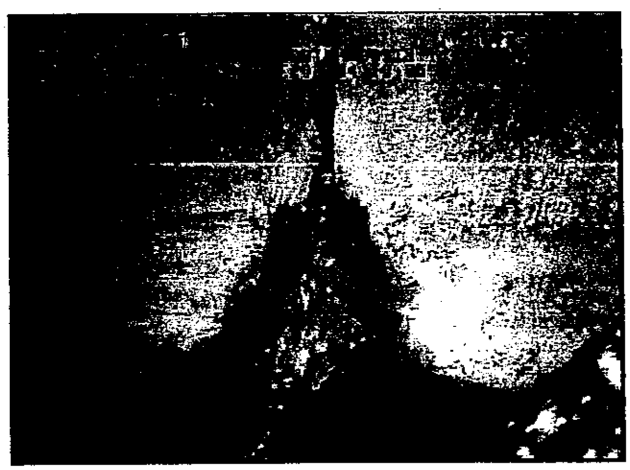

Photo: 17a, Tape No.: BM 1, 00:27:45
200FT, infiltration, runner from 04 to 05 o´clock

Photo: 18a, Tape No.: BM 1, 00:29:01
204.2FT, infiltration, dripper from 04 to 05 o´clock

The Environmental
Protection Specialists

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519 and Rainey Road
Eighty Four, PA 15330
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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031113	1	

Photo: 20a, Tape No.: BM 1, 00:31:18
212FT, infiltration, runner from 03 to 04 o´clock

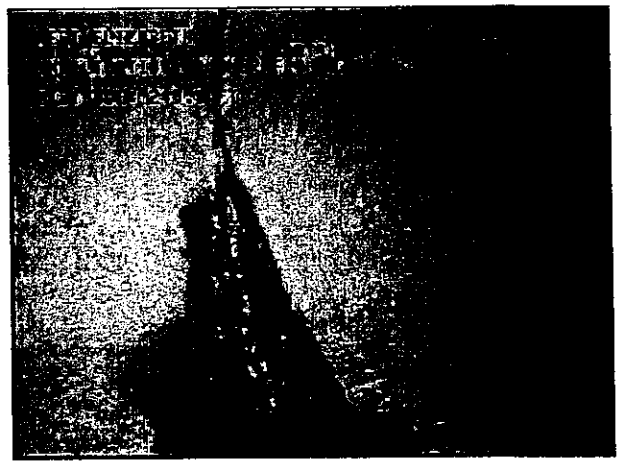

Photo: 24a, Tape No.: BM 1, 00:35:49
240.3FT, infiltration, runner from 07 to 08 o´clock

Photo: 25a, Tape No.: BM 1, 00:36:26
240.3FT, infiltration, runner from 04 to 05 o´clock

Photo: 26a, Tape No.: BM 1, 00:37:13
244.7FT, infiltration, runner from 04 to 05 o´clock

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Eighty Four, PA 15330
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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	**RT 837**	**20031113**	**1**	

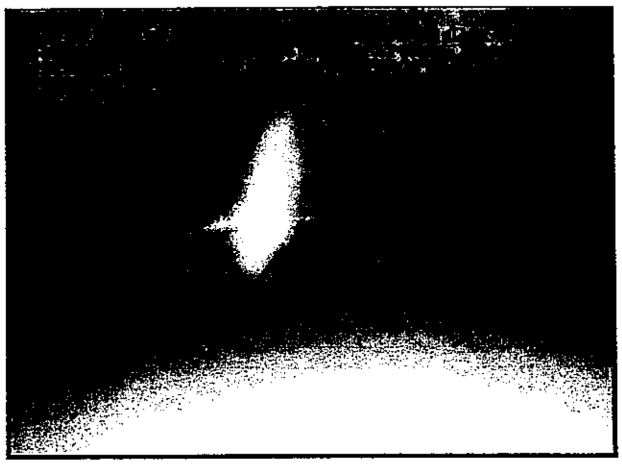


Photo: 28a, Tape No.: BM 1, 00:43:10
323.2FT, miscellaneous, survey abandoned WATER & MATERIAL

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

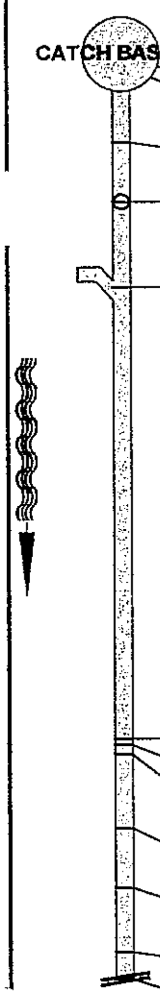
Inspection report

Date: 20031113	P.O.#	Weather: 5 Wet	Surveyor/Cert #: B MORRIS U-030-250	Section Number: 2	PSR:
Tot Pipe Length:	Survey Customer: HERCULES INC	System Owner: EASTMAN CHEM	Clean Date:	Pre-Cleaned: N No pre-cleaning	Rate:

Street: RT 837	Flow Control:	MH: CATCH BASIN 1
City: WEST ELIZABETH	Year Renewed	MH: POND
Location Code: C Light highway	Tape/Media #: BM 1	Length Surveyed: 202.3 ft

Reason for inspection:	B Infiltration and Inflow investigation	Dia/Ht:	C Circular 24"
Use:	SW Storm Water	Material:	CP Concrete pipe (non-reinforced) Pipe Jt:
		Lining Material:	
Drainage Area:		:	Enter Z if unknown

Comments:



1:500	position	code	observation	grade	counter	photo
CATCH BASIN 1	3.00	AMH	access points, manhole, Comments: Upstream MH	1	00:43:54	
	3.00	MWL	miscellaneous, water level, 5 %		00:44:08	
	19.60	IW	infiltration, weeper from 04 to 05 o'clock	2	00:45:20	
	32.40	TBA	tap break-in/hammer, active at 12 o'clock	2	00:46:28	32a
	51.30	TBA	tap break-in/hammer, active at 04 o'clock	2	00:48:07	33a
	150.10	OBI	obstacles, object protruding thru wall, < 10% from 11 to 12 o'clock	2	00:52:02	34a
	151.20	HSV	pipe failure, hole, soil visible from 12 to 01 o'clock	5	00:53:16	35a
	153.30	IW	infiltration, weeper from 04 to 05 o'clock	2	00:54:17	
	169.50	IW	infiltration, weeper from 05 to 06 o'clock	2	00:55:36	
	182.40	LLD	line, left/down, < 10 degrees	1	00:56:31	
	196.40	MWL	miscellaneous, water level PONDERING		00:57:32	
	202.30	MSA	miscellaneous, survey abandoned MATERIAL		00:58:37	40a

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax: (724) 228-5624

Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031113	2	

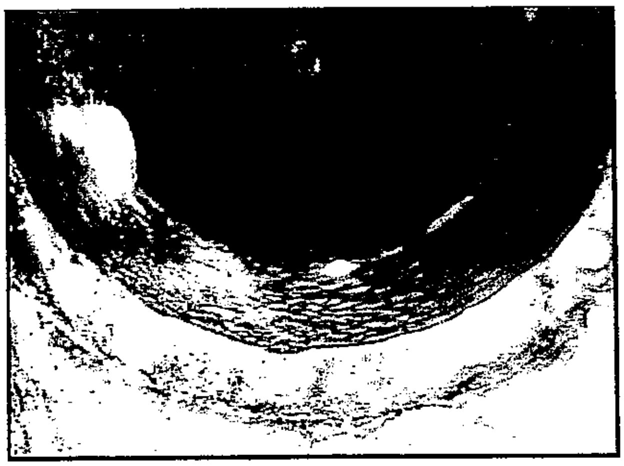


Photo: 32a, Tape No.: BM 1, 00:46:28
32.4FT, tap break-in/hammer, active at 12 o´clock

Photo: 33a, Tape No.: BM 1, 00:48:07
51.3FT, tap break-in/hammer, active at 04 o´clock

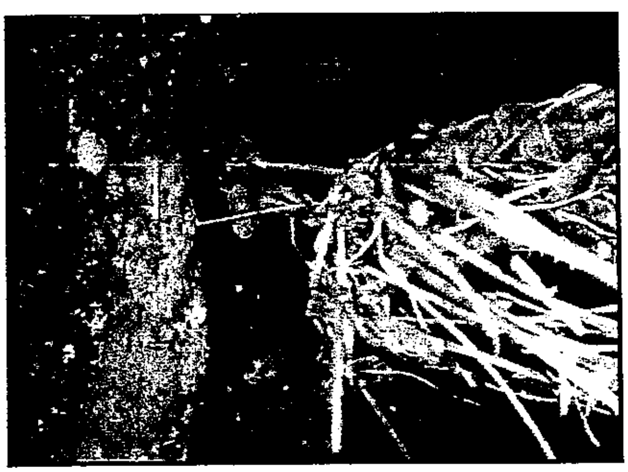


Photo: 34a, Tape No.: BM 1, 00:52:02
150.1FT, obstacles, object protruding thru wall, < 10% from 11
to
12 o´clock

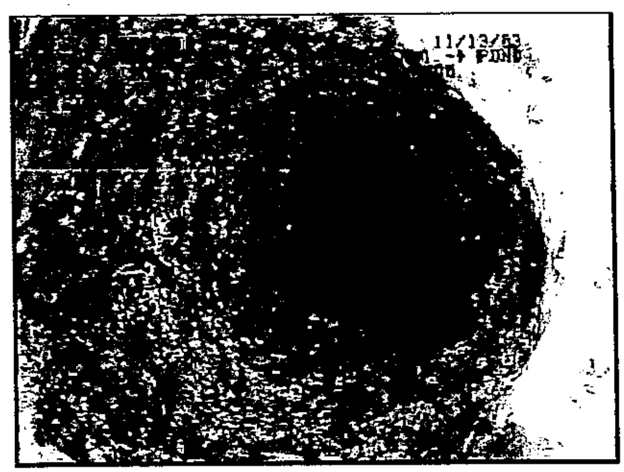


Photo: 35a, Tape No.: BM 1, 00:53:16
151.2FT, pipe failure, hole, soil visible from 12 to 01 o´clock

The Environmental
Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	**RT 837**	**20031113**	**2**	

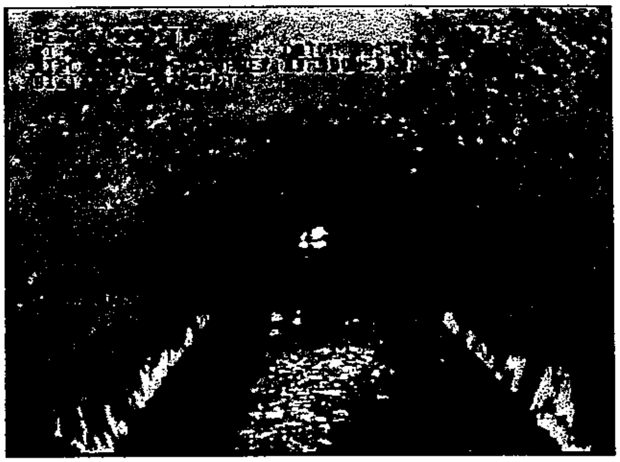


Photo: 40a, Tape No.: BM 1, 00:58:37
202.3FT, miscellaneous, survey abandoned MATERIAL

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

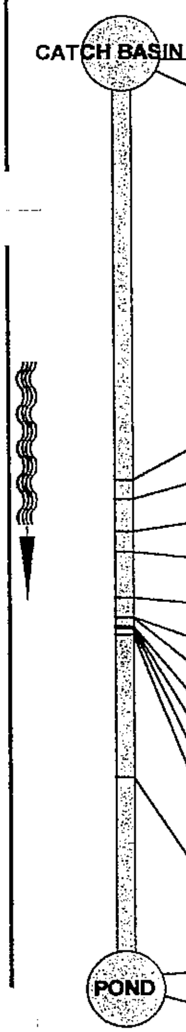
Inspection report

Date: 20031114	P.O.#	Weather: 5 Wet	Surveyor/Cert #: B MORRIS U-030-250	Section Number: 3	PSR:
Tot Pipe Length:	Survey Customer: HERCULES INC	System Owner: EASTMAN CHEM	Clean Date:	Pre-Cleaned: N No pre-cleaning	Rate:

Street: RT 837	Flow Control:	MH: CATCH BASIN 1
City: WEST ELIZABETH	Year Renewed	MH: POND
Location Code: C Light highway	Tape/Media #: BM 1	Length Surveyed: 398.2 ft

Reason for inspection: B Infiltration and Inflow investigation	Dia/Ht: C Circular 36"
Use: SW Storm Water	Material: CP Concrete pipe (non-reinforced) Pipe Jt:
	Lining Material:
Drainage Area:	: Enter Z if unknown

Comments:



1:975	position	code	observation	grade	counter	photo
CATCH BASIN 1	3.00	AMH	access points, manhole, Comments: Upstream MH	1	00:59:34	
	3.00	MWL	miscellaneous, water level, 5 %		00:59:55	
	182.20	DAE	deposits attached, encrustation, < 10% from 03 to 06 o'clock	3	01:06:12	
	190.20	MWLS	miscellaneous, water level sag, < 20%	2	01:07:03	
	204.50	ID	infiltration, dripper from 04 to 05 o'clock	3	01:08:47	45a
	212.90	IW	infiltration, weeper from 03 to 04 o'clock	2	01:12:00	
	232.40	DAE	deposits attached, encrustation, < 10% from 02 to 04 o'clock	3	01:15:44	
	240.90	IR	infiltration, runner from 04 to 05 o'clock	4	01:17:56	48a
	240.90	ID	infiltration, dripper from 07 to 08 o'clock	3	01:18:44	49a
	244.80	IR	infiltration, runner from 03 to 04 o'clock	4	01:20:14	50a
	245.00	ID	infiltration, dripper from 12 to 01 o'clock	3	01:22:05	
	245.20	CL	crack, longitudinal at 12 o'clock	2	01:22:41	
	248.10	CC	crack, circumferential from 02 to 05 o'clock	2	01:24:45	53a
	308.80	ID	infiltration, dripper from 07 to 09 o'clock	3	01:31:14	54a
	393.20	JSL	joint separated, large, from 04 to 07 o'clock GAP	2	01:43:05	55a, b
POND	398.20	A	access point END AT POND		01:46:05	56a, b

The Environmental
Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax: (724) 228-5624

Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031114	3	

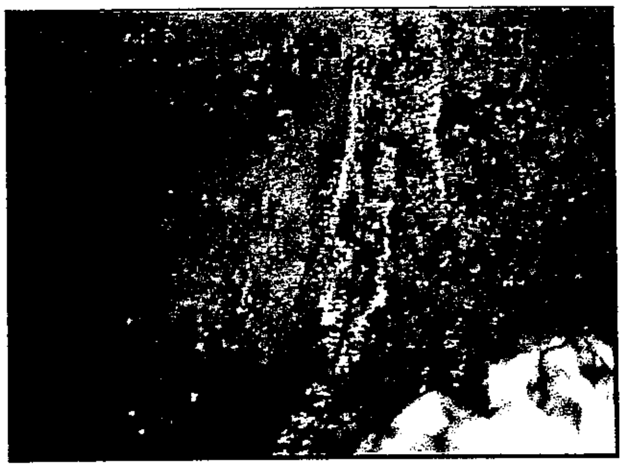


Photo: 45a, Tape No.: BM 1, 01:08:47
204.5FT, infiltration, dripper from 04 to 05 o´clock

Photo: 48a, Tape No.: BM 1, 01:17:56
240.9FT, infiltration, runner from 04 to 05 o´clock

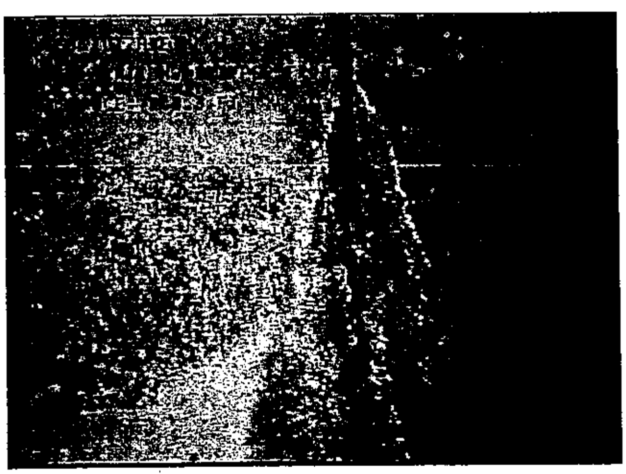


Photo: 49a, Tape No.: BM 1, 01:18:44
240.9FT, infiltration, dripper from 07 to 08 o´clock

Photo: 50a, Tape No.: BM 1, 01:20:14
244.8FT, infiltration, runner from 03 to 04 o´clock

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031114	3	

Photo: 53a, Tape No.: BM 1, 01:24:45
248.1FT, crack, circumferential from 02 to 05 o´clock

Photo: 54a, Tape No.: BM 1, 01:31:14
308.8FT, infiltration, dripper from 07 to 09 o´clock

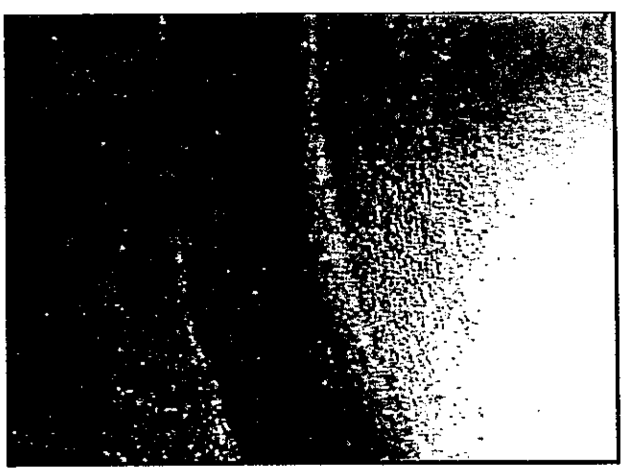


Photo: 55a, Tape No.: BM 1, 01:43:05
393.2FT, joint separated, large, from 04 to 07 o´clock GAP

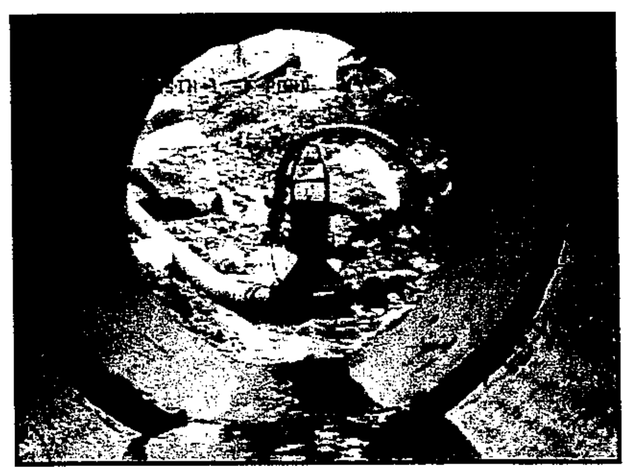


Photo: 55b, Tape No.: BM 1, 01:43:05
393.2FT, joint separated, large, from 04 to 07 o´clock GAP

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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031114	3	

Photo: 56a, Tape No.: BM 1, 01:46:05
398.2FT, access point END AT POND

Photo: 56b, Tape No.: BM 1, 01:46:05
398.2FT, access point END AT POND

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

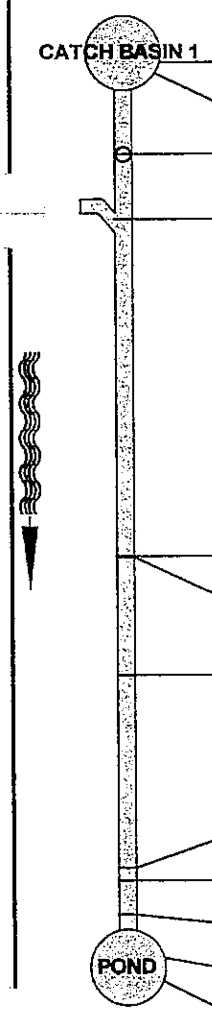
Inspection report

Date:	P.O.#	Weather:	Surveyor/Cert #:	Section Number:	PSR:
20031118		1 Dry	B MORRIS U-030-250	4	
Tot Pipe Length:	Survey Customer: HERCULES INC	System Owner: EASTMAN CHEM	Clean Date:	Pre-Cleaned: H Heavy cleaning	Rate:

Street: RT 837	Flow Control:	MH: CATCH BASIN 1
City: WEST ELIZABETH	Year Renewed	MH: POND
Location Code: C Light highway	Tape/Media #: BM 2	Length Surveyed: 270 ft

Reason for inspection:	B Infiltration and Inflow investigation	Dia/Ht:	C Circular 24"
Use:	SW Storm Water	Material:	CP Concrete pipe (non-reinforced) Pipe Jt:
		Lining Material:	
Drainage Area:		:	Enter Z if unknown

Comments:



1:675	position	code	observation	grade	counter	photo
CATCH BASIN 1	3.00	AMH	access points, manhole, Comments: Upstream MH	1	00:00:49	
	3.00	MWL	miscellaneous, water level, 5 %		00:01:09	
	30.20	TBA	tap break-in/hammer, active at 12 o'clock	2	00:03:36	59a
	49.40	TFA	tap factory made, active at 05 o'clock, 6 in		00:05:25	60a
	149.10	H	pipe failure, hole from 12 to 01 o'clock	3	00:12:32	61a
	149.20	OBZ	obstacles, other objects, < 10% from 12 to 01 o'clock PROTRUDING	2	00:13:18	62a
	184.30	LLD	line, left/down, < 10 degrees	1	00:16:34	
	240.70	IW	infiltration weeper from 11 to 12 o'clock	2	00:23:41	
	244.60	J	joint WITH OIL FILM		00:26:44	65a
	254.40	H	pipe failure, hole from 03 to 04 o'clock	3	00:31:21	66a, b
POND	265.80	J	joint AT END OF PIPE WIDER		00:34:50	67a
	270.00	A	access point END AT POND		00:37:51	68a

The Environmental Protection Specialists

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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031118	4	

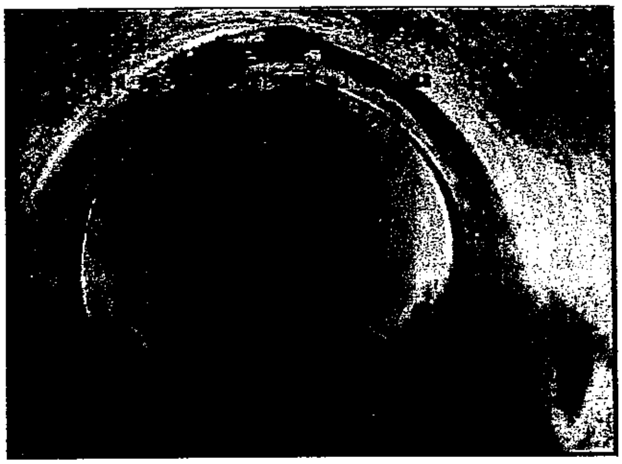

Photo: 59a, Tape No.: BM 2, 00:03:36
30.2FT, tap break-in/hammer, active at 12 o´clock

Photo: 60a, Tape No.: BM 2, 00:05:25
49.4FT, tap factory made, active at 05 o´clock, 6 in

Photo: 61a, Tape No.: BM 2, 00:12:32
149.1FT, pipe failure, hole from 12 to 01 o´clock

Photo: 62a, Tape No.: BM 2, 00:13:18
149.2FT, obstacles, other objects, < 10% from 12 to 01 o´clock
PROTRUDING

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
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Eighty Four, PA 15330
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Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	**RT 837**	**20031118**	**4**	

Photo: 65a, Tape No.: BM 2, 00:26:44
244.6FT, joint WITH OIL FILM

Photo: 66a, Tape No.: BM 2, 00:31:21
254.4FT, pipe failure, hole from 03 to 04 o´clock

Photo: 66b, Tape No.: BM 2, 00:31:21
254.4FT, pipe failure, hole from 03 to 04 o´clock

Photo: 67a, Tape No.: BM 2, 00:34:50
265.8FT, joint AT END OF PIPE WIDER

The Environmental Protection Specialists

Robinson Pipe Cleaning Co.
519 and Rainey Road
Eighty Four, PA 15330
Tel: (800) 553-4690, Fax (724) 228-5624

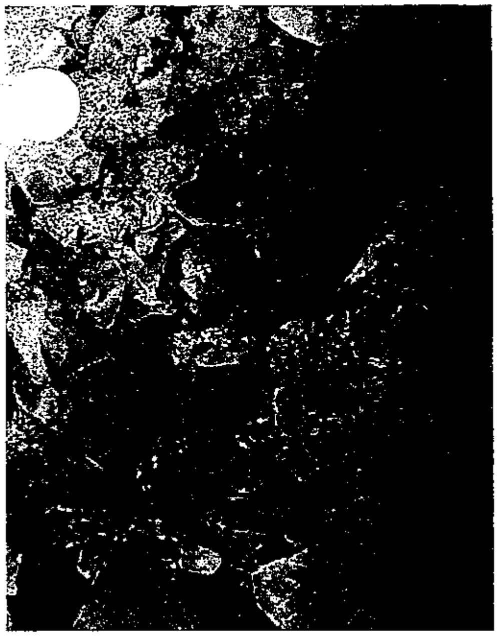
Inspection photos

City:	Street:	Date:	Section Number:	PSR:
WEST ELIZABETH	RT 837	20031118	4	

Photo: 68a, Tape No.: BM 2, 00:37:51
270FT, access point END AT POND

ATTACHMENT C

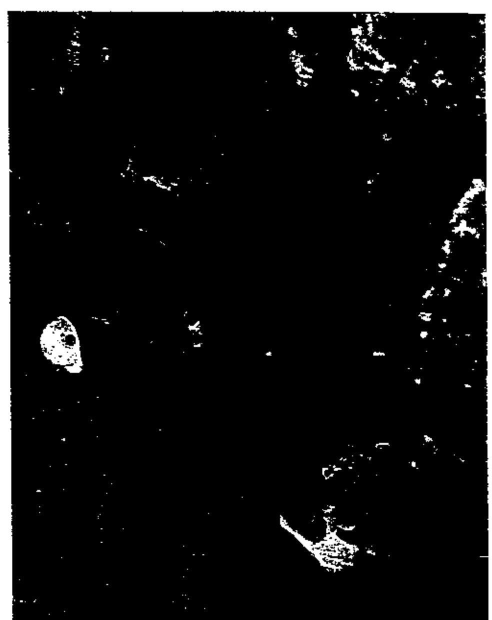
PHOTOGRAPHS



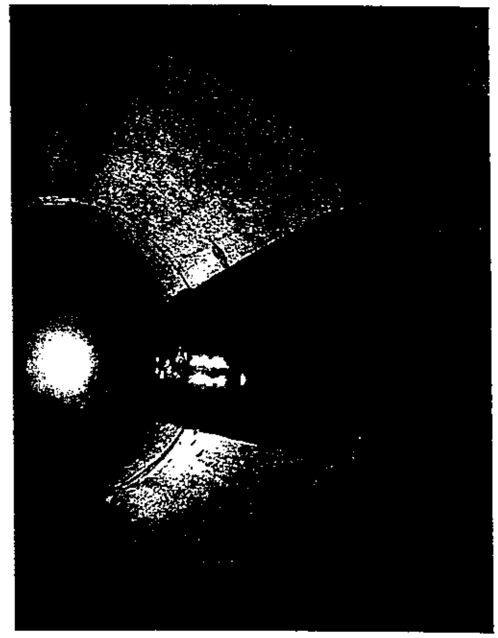






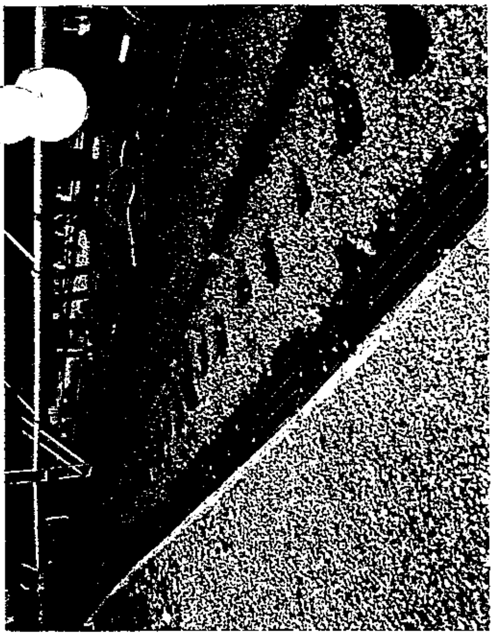
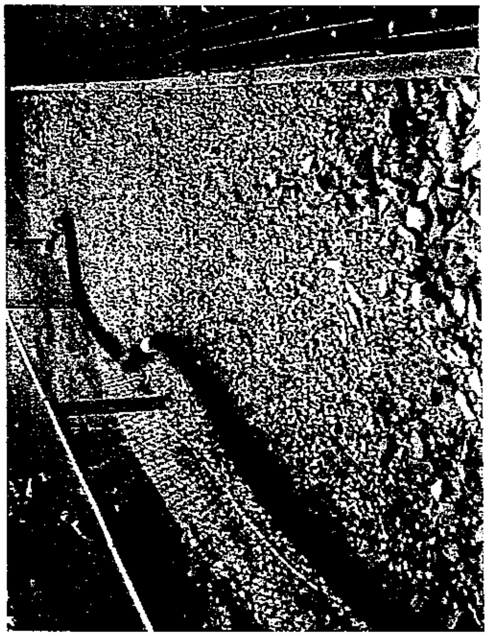
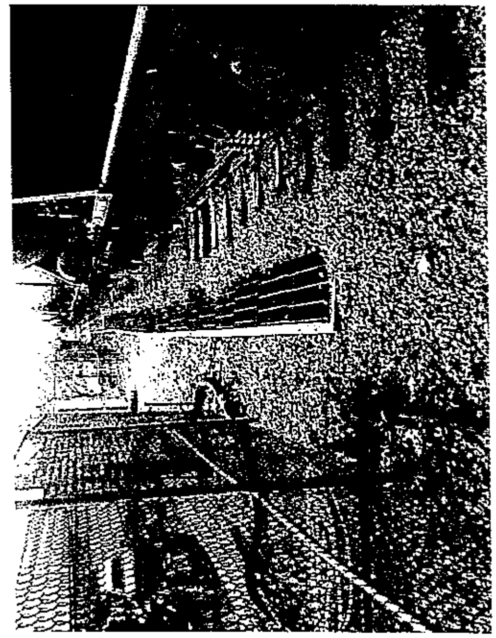
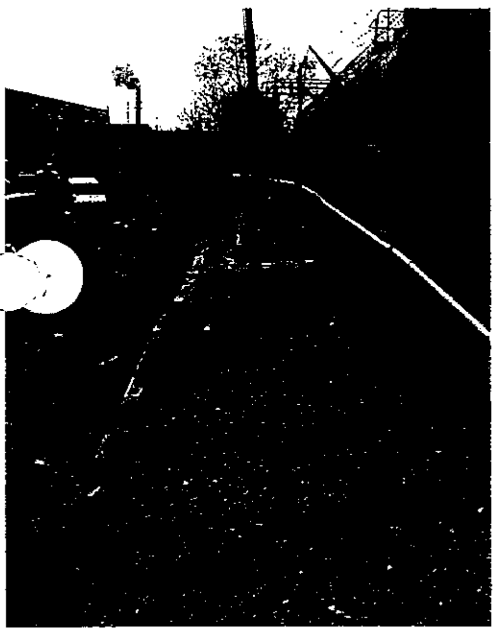
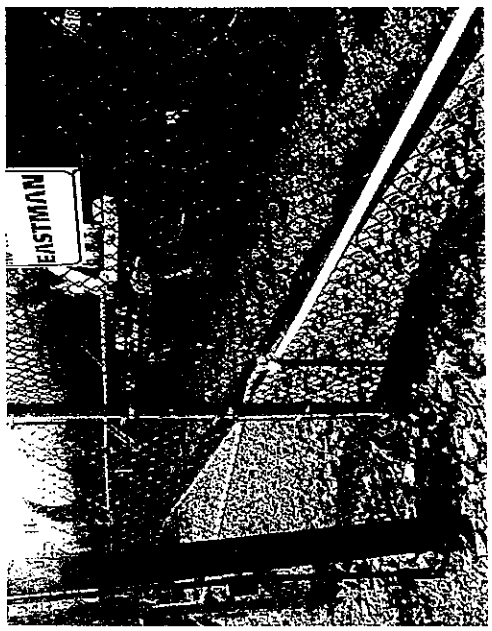
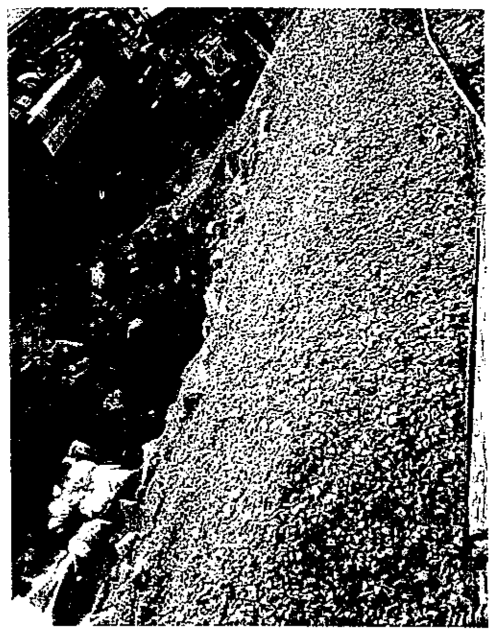
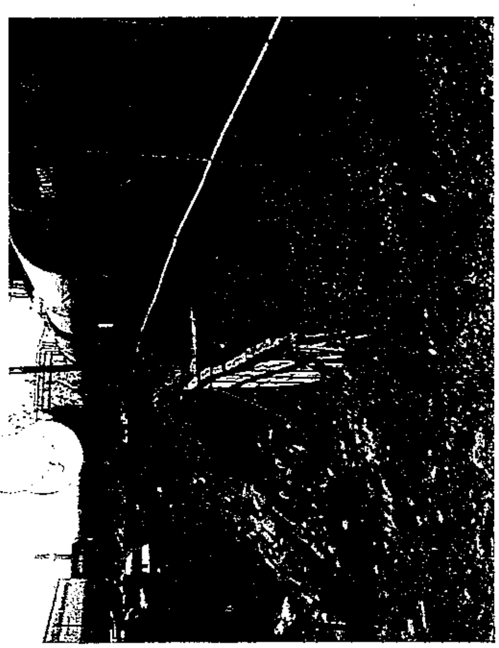


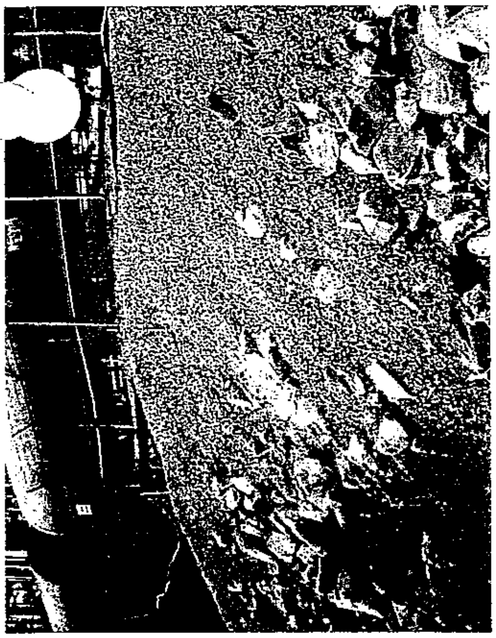




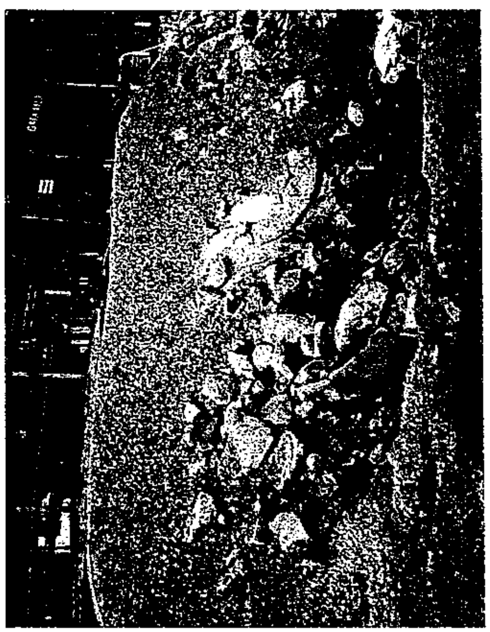









EASTMAN







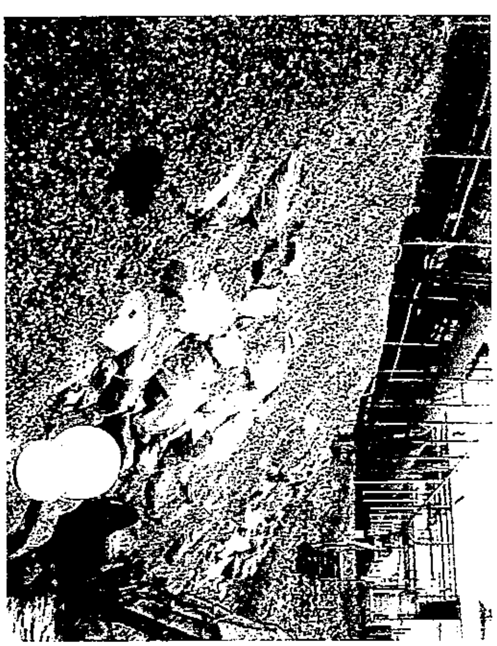




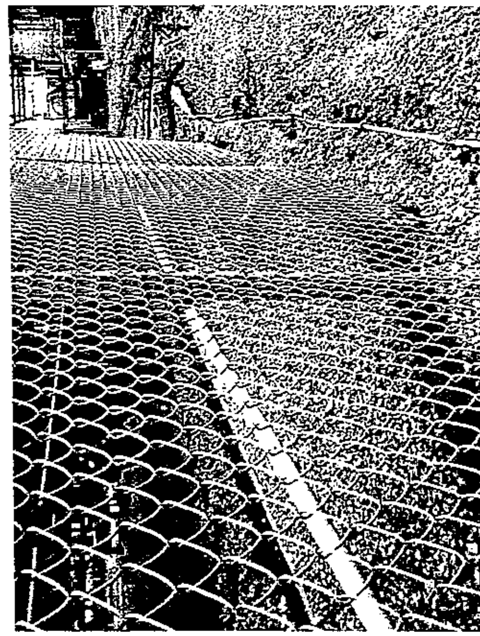
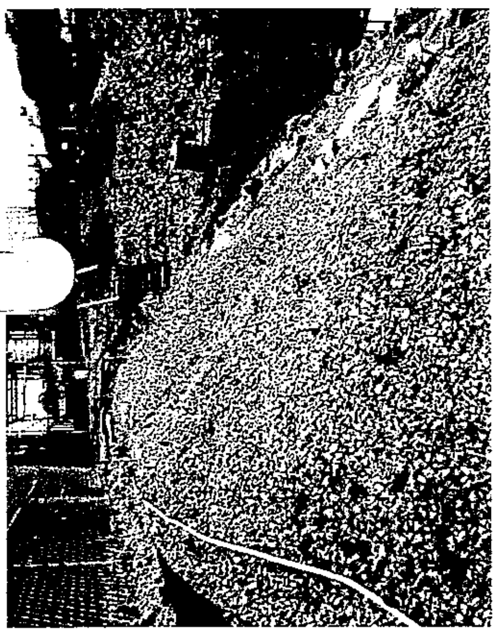


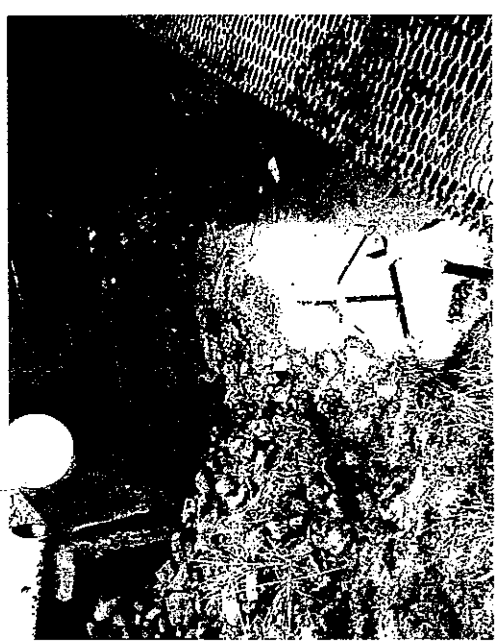


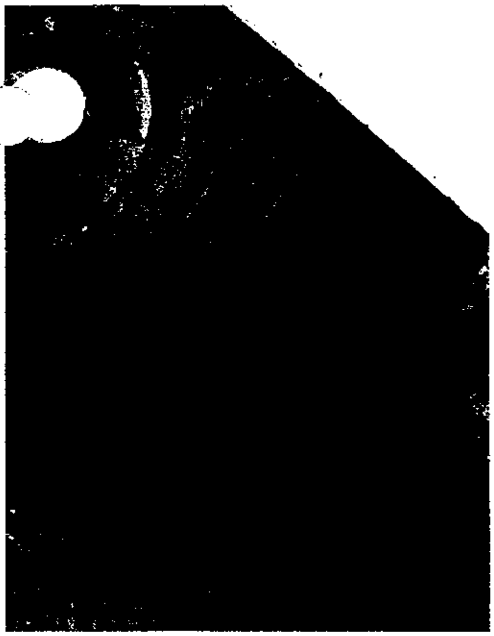






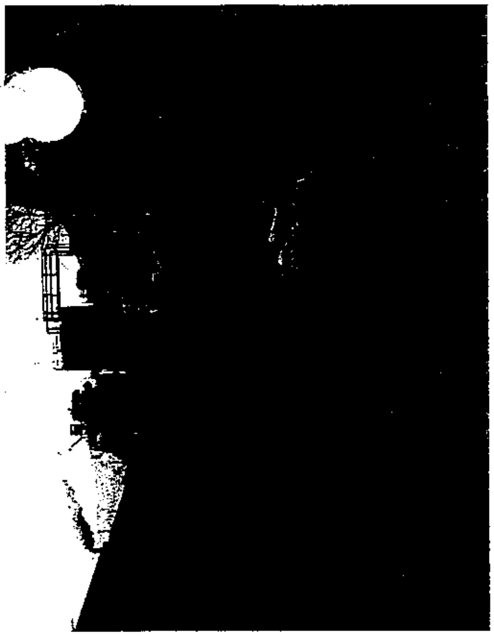



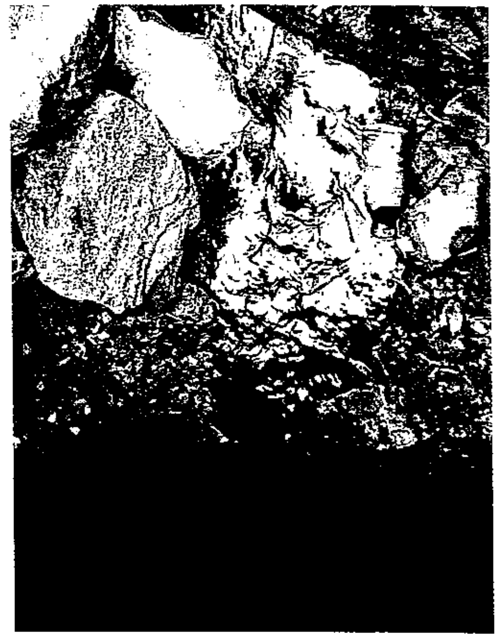
























APPENDIX C

FIELD FORMS

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules / Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 3 / 1 / 04
WELL I.D.: E-21

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 2.08 ft TOR
DEPTH TO PUMP: 10.0 ft TOR
FEET OF WATER IN LINE: 7.92 feet
VOLUME OF WATER IN LINE: 0.02 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	2.08	6.49	1.7	9.3	0.85	740	-41
5	2.08	6.60	1.7	9.2	0.48	250	-41
10	2.09	6.75	1.7	9.2	0.20	0	-41
15	2.09	6.86	1.7	9.3	0.00	0	-42
20	2.09	6.86	1.7	9.3	0.00	0	-42
25	2.09	6.87	1.7	9.3	0.00	0	-42
30	2.09	6.87	1.7	9.3	0.00	0	-42

PURGE START TIME: 0850 PURGE END TIME: 0920 TOTAL VOLUME PURGED: ~0.79 gal
APPROXIMATE PURGE RATE: 100 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: clear - 45°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules-Jefferson	TUBING DIAMETER:	3/8 inches
PROJECT NO.:	013051.40	DEPTH TO WATER:	23.20 ft TOR
SAMPLING DEVICE:	Whale Pump	DEPTH TO PUMP:	~ 50.0 ft TOR
DATE:	3/1/04	FEET OF WATER IN LINE:	26.80 feet
WELL I.D.:	E-28D	VOLUME OF WATER IN LINE:	0.134 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	23.23	6.28	0.17	13.1	2.59	130	-67
5	23.26	6.60	0.17	12.5	0.80	490	-81
10	23.24	6.67	0.17	13.6	0.64	420	-102
15	23.24	6.73	0.17	14.0	0.69	140	-116
20	23.24	6.81	0.17	14.2	0.58	90	-124
25	23.24	6.84	0.17	14.3	0.40	63	-128
30	23.24	6.85	0.16	14.4	0.38	64	-130
35	23.24	6.86	0.16	14.5	0.36	69	-131
40	23.24	6.86	0.16	14.5	0.35	70	-132

PURGE START TIME: 9:02 PURGE END TIME: 09:42 TOTAL VOLUME PURGED: ~ 3.17 gal

APPROXIMATE PURGE RATE: 300 ml/min PURGED/SAMPLED BY: CLN

WEATHER CONDITIONS: Sunny, 50's

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 3/11/04
WELL I.D.: W-1A

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 7.63 ft TOR
DEPTH TO PUMP: 15.0 ft TOR
FEET OF WATER IN LINE: 7.37 feet
VOLUME OF WATER IN LINE: 0.02 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	7.63	7.60	84	10.3	0.69	64	9
5	7.67	7.46	84	10.3	0.34	0	10
10	7.70	7.25	75	10.5	0.00	0	14
15	7.72	7.10	71	10.4	0.00	0	18
20	7.72	7.11	67	10.3	0.00	0	18
25	7.73	7.11	67	10.3	0.00	0	17
30	7.73	7.10	67	10.4	0.00	0	18
35							

PURGE START TIME: 0945 PURGE END TIME: 1015 TOTAL VOLUME PURGED: ~1.19 gal
APPROXIMATE PURGE RATE: 150 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: Clear - 50°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules-Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: Whale Pump
DATE: 3/1/04
WELL I.D.: E-59

TUBING DIAMETER: 3/8 inches
DEPTH TO WATER: 10.70 ft TOR
DEPTH TO PUMP: ~ 55.0 ft TOR
FEET OF WATER IN LINE: 44.30 feet
VOLUME OF WATER IN LINE: 0.22 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	10.74	6.93	0.12	14.3	0.62	OOR	-31
5	10.77	6.89	0.12	14.8	0.35	990	-32
10	10.76	6.89	0.12	14.9	0.34	990	-32
15	10.75	6.89	0.12	14.9	0.32	990	-31
20	10.75	6.90	0.12	15.0	0.32	990	-31
25	10.75	6.91	0.12	15.1	0.31	990	-32
30	10.75	6.91	0.12	15.1	0.31	670	-32
35	10.75	6.92	0.12	15.2	0.31	470	-32
40	10.75	6.91	0.12	15.2	0.31	390	-32
45	10.75	6.91	0.12	15.2	0.31	360	-31
50	10.75	6.91	0.12	15.3	0.31	350	-31
55	10.75	6.91	0.11	15.3	0.30	340	-31

PURGE START TIME: 10:40 PURGE END TIME: 11:35 TOTAL VOLUME PURGED: ~5.81 gal
APPROXIMATE PURGE RATE: 400 ml/min PURGED/SAMPLED BY: CLN
WEATHER CONDITIONS: Sunny, 50°s
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson **TUBING DIAMETER:** 1/4 inches

PROJECT NO.: 013054.0 **DEPTH TO WATER:** 13.19 ft TOR

SAMPLING DEVICE: peristaltic pump **DEPTH TO PUMP:** 18.0 ft TOR

DATE: 3/1/04 **FEET OF WATER IN LINE:** 4.81 feet

WELL I.D.: W-7 **VOLUME OF WATER IN LINE:** 0.01 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	13.26	7.08	0.16	10.8	3.58	31	-89
10	13.28	7.10	0.16	10.4	0.27	31	-103
15	13.26	7.11	0.16	10.4	0.00	15	-133
20	13.26	7.11	0.16	10.3	0.00	15	-141
25	13.30	7.12	0.16	10.4	0.00	18	-141
30	13.36	7.12	0.16	10.4	0.00	18	-142

PURGE START TIME: 1050 **PURGE END TIME:** 1120 **TOTAL VOLUME PURGED:** ~0.99 **gal**

APPROXIMATE PURGE RATE: 125 **ml/min** **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: mostly cloudy; 56°F

COMMENTS: total depth = 18.67 ft toc

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: whale pump
DATE: 3/1/04
WELL I.D.: E-47D

TUBING DIAMETER: 3/8 inches
DEPTH TO WATER: 20.55 ft TOR
DEPTH TO PUMP: 55.0 ft TOR
FEET OF WATER IN LINE: 34.45 feet
VOLUME OF WATER IN LINE: 0.17 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	20.60	6.94	0.13	15.3	0.96	50	-3
10	20.65	6.94	0.13	15.2	2.38	6	12
15	20.68	6.95	0.14	15.2	0.12	6	-43
20	20.71	7.02	0.14	15.3	0.01	5	-82
25	20.73	7.04	0.14	15.3	0.00	0	-85
30	20.75	7.04	0.14	15.2	0.00	0	-86
35	20.77	7.05	0.14	15.2	0.00	0	-86

PURGE START TIME: 1230 PURGE END TIME: 1305 TOTAL VOLUME PURGED: ~2.54 gal
APPROXIMATE PURGE RATE: 275 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: clear - 60°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules - Jefferson TUBING DIAMETER: 3/8 inches

PROJECT NO.: 01305.40 DEPTH TO WATER: 23.03 ft TOR

SAMPLING DEVICE: Whale Pump DEPTH TO PUMP: ~ 55.0 ft TOR

DATE: 3/1/04 FEET OF WATER IN LINE: 31.97 feet

WELL I.D.: E-46D VOLUME OF WATER IN LINE: 0.16 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	23.15	6.97	0.23	15.0	8.72	28	160
5	23.15	7.14	0.24	14.4	6.58	20	128
10	23.14	7.16	0.24	14.6	5.38	20	91
15	23.12	7.16	0.24	14.6	4.67	20	71
20	23.10	7.17	0.24	14.6	3.88	21	57
25	23.09	7.17	0.24	14.5	3.19	22	47
30	23.09	7.17	0.25	14.5	2.70	23	39
35	23.09	7.16	0.25	14.5	2.30	24	25
40	23.09	7.12	0.27	14.5	1.91	22	-36
45	23.09	7.11	0.28	14.5	1.55	21	-55
50	23.09	7.10	0.28	14.6	1.28	21	-60
55	23.09	7.10	0.28	14.6	0.93	21	-63
60	23.09	7.10	0.28	14.6	0.91	20	-67
65	23.09	7.10	0.28	14.6	0.89	20	-69

PURGE START TIME: 12:30 PURGE END TIME: 13:35 TOTAL VOLUME PURGED: ~4.29 gal

APPROXIMATE PURGE RATE: 250 ml/min PURGED/SAMPLED BY: CLN

WEATHER CONDITIONS: Sunny, 50's

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules / Jefferson	**TUBING DIAMETER:**	3/8	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	20.18	ft TOR
SAMPLING DEVICE:	whale pump	**DEPTH TO PUMP:**	45.0	ft TOR
DATE:	3/1/04	**FEET OF WATER IN LINE:**	24.82	feet
WELL I.D.:	RE-170	**VOLUME OF WATER IN LINE:**	0.12	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	20.24	5.51	75	16.9	3.10	700	97
10	20.24	5.40	76	16.8	2.64	960	101
15	20.24	5.50	76	16.8	2.51	930	102
20	20.25	5.58	79	17.1	6.18	above detection limits	80
25	20.26	5.71	89	16.8	6.42	840	49
30	20.26	5.75	90	16.8	6.39	580	47
35	20.27	5.75	90	16.7	6.40	370	47
40	20.27	5.76	91	16.8	6.41	370	48
45	20.27	5.75	91	16.7	6.39	370	48

PURGE START TIME: 1415 **PURGE END TIME:** 1500 **TOTAL VOLUME PURGED:** ~4.16 **gal**

APPROXIMATE PURGE RATE: 350 **ml/min** **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: clear - 60°F

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules-Jefferson	TUBING DIAMETER:	3/8	inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	15.76	ft TOR
SAMPLING DEVICE:	Whale Pump	DEPTH TO PUMP:	~ 59.0	ft TOR
DATE:	3/1/04	FEET OF WATER IN LINE:	43.24	feet
WELL I.D.:	E-60	VOLUME OF WATER IN LINE:	0.21	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	15.81	7.28	0.11	17.1	1.65	22	-113
5	15.82	6.95	0.12	16.5	0.46	990	-127
10	15.81	6.93	0.12	16.5	0.37	990	-133
15	15.81	6.93	0.12	16.5	0.34	990	-134
20	15.81	6.93	0.12	16.5	0.31	990	-134
25	15.81	6.93	0.12	16.5	0.28	990	-132
30	15.81	6.93	0.12	16.5	0.28	990	-132
35	15.81	6.93	0.12	16.5	0.27	990	-131
40	15.80	6.93	0.12	16.3	0.27	940	-131

PURGE START TIME: 14:27 PURGE END TIME: 15:07 TOTAL VOLUME PURGED: ~3.69 gal

APPROXIMATE PURGE RATE: 350 ml/min PURGED/SAMPLED BY: CLN

WEATHER CONDITIONS: Sunny, 60°s

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules / Jefferson

PROJECT NO.: 61305.40

SAMPLING DEVICE: whale pump

DATE: 3 / 1 / 04

WELL I.D.: E-13D

TUBING DIAMETER: 3/8 inches

DEPTH TO WATER: 21.69 ft TOR

DEPTH TO PUMP: 65.0 ft TOR

FEET OF WATER IN LINE: 43.31 feet

VOLUME OF WATER IN LINE: 0.22 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	21.70	6.84	0.11	15.6	0.00	above detection limit	-94
10	21.70	6.93	0.11	15.5	0.00	"	-95
15	21.72	6.96	0.11	15.5	0.00	"	-99
20	21.72	6.96	0.11	15.5	0.00	"	-100
25	21.73	6.97	0.11	15.6	0.00	"	-101
30	21.73	6.98	0.11	15.5	0.00	"	-101
35	21.73	6.98	0.11	15.5	0.00	"	-101
40	21.74	6.98	0.11	15.5	0.00	"	-101
45	21.74	6.97	0.11	15.5	0.00	"	-101
50	21.75	6.97	0.11	15.5	0.00	"	-102
55	21.75	6.98	0.11	15.5	0.00	"	-103

PURGE START TIME: 1535 PURGE END TIME: 1630 TOTAL VOLUME PURGED: ~5.09 gal

APPROXIMATE PURGE RATE: 350 ml/min PURGED/SAMPLED BY: CGK

WEATHER CONDITIONS: overcast ~56°F

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules - Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: Whale Pump
DATE: 3/1/04
WELL I.D.: E-45D

TUBING DIAMETER: 3/8 inches
DEPTH TO WATER: 12.80 ft TOR
DEPTH TO PUMP: ~ 48 ft TOR
FEET OF WATER IN LINE: 35.2 feet
VOLUME OF WATER IN LINE: 0.175 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	13.11	6.85	1.2	15.4	1.85	190	-94
5	13.47	7.31	1.5	14.2	0.41	990	-111
10	13.75	7.40	1.6	14.2	0.33	690	-116
15	14.04	7.44	1.6	14.1	0.31	330	-120
20	14.29	7.46	1.5	14.3	0.28	370	-122
25	14.72	7.46	1.6	14.2	0.26	390	-125
30	14.94	7.50	1.6	14.3	0.26	380	-126

PURGE START TIME: 16:00 PURGE END TIME: 16:30 TOTAL VOLUME PURGED: ~0.79 gal
APPROXIMATE PURGE RATE: 100 ml/min PURGED/SAMPLED BY: CLN
WEATHER CONDITIONS: Cloudy, breezy, 50°'s
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: Whale Pump
DATE: 3/2/04
WELL I.D.: E-62

TUBING DIAMETER: 3/8 inches
DEPTH TO WATER: 21.30 ft TOR
DEPTH TO PUMP: ~ 60 ft TOR
FEET OF WATER IN LINE: 38.70 feet
VOLUME OF WATER IN LINE: 0.19 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/cm)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	22.07	6.59	69	14.7	6.48	190	-163
5	22.55	7.09	66	14.5	0.62	610	-204
10	23.02	7.20	65	14.8	0.47	790	-205
15	23.50	7.28	60	15.0	0.43	170	-206
20	23.57	7.29	66	14.9	0.43	170	-206
25	23.74	7.30	64	14.9	0.39	190	-206
30	23.89	7.32	64	15.0	0.37	210	-206
35	23.94	7.34	63	14.9	0.36	210	-206
40	24.07	7.34	63	15.0	0.35	220	-20

PURGE START TIME: 09:03 **PURGE END TIME:** 09:43 **TOTAL VOLUME PURGED:** ~1.06 gal
APPROXIMATE PURGE RATE: 100 ml/min **PURGED/SAMPLED BY:** CLN
WEATHER CONDITIONS: Sunny, windy, 50°'s
COMMENTS: Well continues to draw down despite low purge rate

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/ Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: whale pump

DATE: 3/2/04

WELL I.D.: E-3AD

TUBING DIAMETER: 3/8 inches

DEPTH TO WATER: 5.25 ft TOR

DEPTH TO PUMP: 50.0 ft TOR

FEET OF WATER IN LINE: 44.75 feet

VOLUME OF WATER IN LINE: 0.22 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	5.30	6.24	86	13.6	1.02	0	-56
10	5.30	7.18	87	14.0	0.00	0	-155
15	5.30	7.24	87	14.2	0.00	0	-160
20	5.31	7.26	87	14.3	0.00	0	-163
25	5.31	7.27	87	14.3	0.00	0	-164
30	5.31	7.27	87	14.4	0.00	0	-164

PURGE START TIME: 0920 **PURGE END TIME:** 0950 **TOTAL VOLUME PURGED:** ~2.77 gal

APPROXIMATE PURGE RATE: 350 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: mostly cloudy ~ 56°F

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: whale pump
DATE: 3/2/04
WELL I.D.: E-8D

TUBING DIAMETER: 3/8 inches
DEPTH TO WATER: 16.15 ft TOR
DEPTH TO PUMP: 60.0 ft TOR
FEET OF WATER IN LINE: 43.85 feet
VOLUME OF WATER IN LINE: 0.22 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	16.17	6.87	0.10	13.8	0.68	93	-137
10	16.17	6.79	0.10	14.2	0.00	30	-144
15	16.18	6.78	0.10	14.3	0.00	0	-143
20	16.18	6.79	0.10	14.3	0.00	0	-147
25	16.18	6.79	0.10	14.3	0.00	0	-147
30	16.19	6.79	0.10	14.3	0.00	0	-146

PURGE START TIME: 1045 PURGE END TIME: 1115 TOTAL VOLUME PURGED: ~ 2.77 gal
APPROXIMATE PURGE RATE: 350 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: mostly cloudy - 60°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules Jefferson	TUBING DIAMETER:	3/8	inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	25.91	ft TOR
SAMPLING DEVICE:	Whale Pump	DEPTH TO PUMP:	~ 75	ft TOR
DATE:	3/2/04	FEET OF WATER IN LINE:	49.09	feet
WELL I.D.:	E-63	VOLUME OF WATER IN LINE:	0.25	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	25.90	7.20	71	15.7	1.65	20	-149
5	25.95	7.08	71	15.3	0.56	3	-164
10	25.95	7.06	71	15.4	0.48	3	-169
15	25.95	7.05	71	15.4	0.42	8	-171
20	25.95	7.05	71	15.4	0.40	14	-172
25	25.94	7.05	71	15.4	0.39	26	-172
30	25.95	7.05	71	15.4	0.37	22	-173
35	25.95	7.05	71	15.4	0.37	24	-172

PURGE START TIME: 10:50 PURGE END TIME: 11:25 TOTAL VOLUME PURGED: ~2.77 gal

APPROXIMATE PURGE RATE: 300 ml/min PURGED/SAMPLED BY: CLN

WEATHER CONDITIONS: Sunny, windy, 50's

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	3/8	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	15.85	ft TOR
SAMPLING DEVICE:	whale pump	**DEPTH TO PUMP:**	60.0	ft TOR
DATE:	3/12/04	**FEET OF WATER IN LINE:**	44.15	feet
WELL I.D.:	E-61	**VOLUME OF WATER IN LINE:**	0.22	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	15.89	7.03	0.11	14.6	9.25	190	-132
10	15.89	7.19	0.10	14.7	6.40	370	-159
15	15.89	7.25	0.10	14.8	2.77	120	-167
20	15.90	7.28	0.11	14.8	0.65	0	-169
25	15.90	7.28	0.11	14.8	0.00	0	-172
30	15.90	7.29	0.11	14.7	0.00	0	-172
35	15.90	7.29	0.11	14.8	0.00	0	-173

PURGE START TIME: 1140 **PURGE END TIME:** 1215 **TOTAL VOLUME PURGED:** ~3.24 gal

APPROXIMATE PURGE RATE: 350 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: misty cloudy - 60°F

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4 inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	14.58 ft TOR
SAMPLING DEVICE:	Peristaltic pump	~~DEPTH TO PUMP:~~ well depth	28 ft TOR
DATE:	1/26/04	FEET OF WATER IN LINE:	13.42 feet
WELL I.D.:	E-15	VOLUME OF WATER IN LINE:	0.03 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	15.15	6.52	72	13.7	10.6	88.4	77
5	15.33	6.51	73	13.7	7.3	14.1	65
10	15.59	6.51	74	13.7	5.7	247.00	42
15	15.75	6.51	74	13.6	5.0	64.7	34
20	15.90	6.51	74	13.5	4.6	7.3	29
25	15.98	6.51	74	13.4	4.3	10.4	26
30	16.03	6.52	75	13.4	4.1	9.9	23
35	16.08	6.52	74	13.4	3.9	10.1	25
40	16.13	6.52	74	13.5	3.8	10.1	23

PURGE START TIME: 16:58 PURGE END TIME: 17:38 TOTAL VOLUME PURGED: ~ 5.28 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: cold

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: submersible whale pump

DATE: 1 / 29 / 04

WELL I.D.: E-62

TUBING DIAMETER: 3/8" inches

DEPTH TO WATER: 19.18 ft TOR

~~DEPTH TO PUMP:~~ Well Depth 65.55 ft TOR

FEET OF WATER IN LINE: 46.37 feet

~~VOLUME OF WATER IN LINE:~~ Well 0.23 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	24.46	9.05	89.0	11.59	0.00	OUT OF RANGE	-134
5	25.32	10.35	88.0	12.82	0.00	"	-174
10	24.19	10.67	89.4	13.50	0.00	"	-171
15	24.93	10.41	86.1	13.58	0.00	"	-184
20	25.88	10.48	85.5	12.56	0.00	"	-191
25	26.18	10.43	85.8	12.54	0.00	"	-189
30	26.45	10.41	86.2	13.42	0.00	"	-189

PURGE START TIME: 09:45 **PURGE END TIME:** 10:15 **TOTAL VOLUME PURGED:** ~ 3.57 gal

APPROXIMATE PURGE RATE: 450 ml/min **PURGED/SAMPLED BY:** MAL

WEATHER CONDITIONS: cold

COMMENTS: One well volume purged prior to low flow. Purge start time for one (7.42) well volume is 09:00. End time is 09:31.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	3/8" inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	5.70 ft TOR
SAMPLING DEVICE:	submersible whalepump	~~DEPTH TO PUMP:~~ well Depth	52.81 ft TOR
DATE:	1/29/04	**FEET OF WATER IN LINE:**	47.11 feet
WELL I.D.:	E-3AD	**VOLUME OF WATER IN LINE:**	0.24 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	6.62	8.62	0.109	11.16	0.00	390	-111
5	6.55	9.60	0.114	11.57	0.00	280	-126
10	6.55	9.92	0.115	11.83	0.00	200	-139
15	6.52	9.93	0.115	12.13	0.00	140	-140
20	6.49	9.95	0.115	11.78	0.00	120	-142
25	6.60	9.92	0.114	12.58	0.00	41	-143
30	6.56	9.97	0.114	12.82	0.00	42	-143
35	6.58	9.98	0.115	13.01	0.00	40	-142

PURGE START TIME: 12:20 **PURGE END TIME:** 12:55 **TOTAL VOLUME PURGED:** ~ 4.62 gal

APPROXIMATE PURGE RATE: 500 ml/min **PURGED/SAMPLED BY:** ______

WEATHER CONDITIONS: cold

COMMENTS: One well volume (7.54) purged prior to low flow. Purge start time for one well volume is 11:45. End time is 12:15.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	3/8" inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	20.90 ft TOR
SAMPLING DEVICE:	submersible whale pump	~~DEPTH TO PUMP~~ well depth:	60.03 ft TOR
DATE:	1/29/04	FEET OF WATER IN LINE:	39.13 feet
WELL I.D.:	E-46D	VOLUME OF WATER IN LINE:	0.20 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	20.49	7.63	0.351	13.37	0.28	14	2
5	20.30	8.81	0.372	13.49	0.00	0	-42
10	20.28	9.05	0.376	13.49	0.00	0	-59
15	20.30	9.06	0.375	13.77	0.00	0	-64
20	20.26	9.05	0.374	13.77	0.00	0	-64
25	20.26	9.00	0.376	13.80	0.00	0	-67
30	20.30	9.04	0.377	13.83	0.00	0	-70

PURGE START TIME: 15:45 PURGE END TIME: 16:15 TOTAL VOLUME PURGED: ~ 3.96 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: cold / partly cloudy

COMMENTS: Purged ~5 gallons prior to low flow; One well volume = 25.43 but water was clear. Pu[rge] sta[rt] time for one well volume is 15:15. End time is 15:28

25.43

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: Submersible whale pump
DATE: 1/30/04
WELL I.D.: E-17D

TUBING DIAMETER: 3/8" inches
DEPTH TO WATER: 20.37 ft TOR
~~DEPTH TO PUMP~~ Well Depth: 49.87 ft TOR
FEET OF WATER IN LINE: 29.5 feet
VOLUME OF WATER IN LINE: 0.15 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing) x .16

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	20.72	6.89	0.100	13.76	0.00	OUT OF RANGE	62
5	20.72	6.87	0.095	14.47	0.00	"	83
10	20.71	6.87	0.095	14.65	0.00	"	79
15	20.72	6.93	0.097	14.62	0.00	"	69
20	20.71	6.96	0.097	14.61	0.00	440	64
25	20.74	6.96	0.098	14.70	0.00	400	63
30	20.72	6.97	0.097	14.77	0.00	250	61
35	20.71	7.04	0.099	14.69	0.00	180	55
40	20.71	7.08	0.100	14.76	0.00	78	54
45	20.72	7.04	0.099	14.75	0.00	77	58
50	20.74	7.02	0.098	14.85	0.00	72	59

PURGE START TIME: 12:10 PURGE END TIME: 13:00 TOTAL VOLUME PURGED: ~ 6.61 gal
APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY:
WEATHER CONDITIONS: cold
COMMENTS: One well volume (4.72) purged prior to low flow purging. Start time is 11:55. Stop time 12:05.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: submersible whale pump

DATE: 1/30/04

WELL I.D.: E-8D

TUBING DIAMETER: 3/8" inches

DEPTH TO WATER: 16.48 ft TOR

~~DEPTH TO PUMP:~~ Well depth: 63.50 ft TOR

FEET OF WATER IN LINE: 47.02 feet

VOLUME OF WATER IN LINE: 0.24 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing) x.16

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	16.67	8.40	0.114	11.73	0.00	150	-92
5	16.65	9.24	0.113	12.41	0.00	120	-115
10	16.65	9.40	0.114	12.54	0.00	43	-124
15	16.70	9.47	0.115	12.85	0.00	27	-130
20	16.68	9.51	0.116	12.77	0.00	0	-134
25	16.69	9.55	0.116	12.89	0.00	0	-138
30	16.71	9.56	0.116	12.87	0.00	0	-140

PURGE START TIME: 14:35 PURGE END TIME: 15:05 TOTAL VOLUME PURGED: ~3.96 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: cold

COMMENTS: Start purging one well volume (7.52) at 14:20. End time 14:30.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	3/8 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	6.15 ft TOR
SAMPLING DEVICE:	SUB WHALE PUMP	WELL DEPTH ~~DEPTH TO PUMP~~:	53.40 ft TOR
DATE:	11 30 04	**FEET OF WATER IN LINE:**	47.25 feet
WELL I.D.:	E-45-D	**VOLUME OF WATER IN LINE:**	0.24 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	32.70	6.25	1.45	12.34	0.00	OUT OF RANGE	136
5	33.82	8.01	1.44	11.11	0.00	"	80
10	34.26	8.81	1.21	12.12	0.00	45	-76
15	34.71	9.32	1.21	13.38	0.00	67	-96
20	35.50	9.36	1.21	13.17	0.00	450	-98
25	35.82	9.33	1.21	12.64	0.00	460	-96
30	36.10	9.34	1.21	12.75	0.00	450	-97

PURGE START TIME: 15:50 **PURGE END TIME:** 16:20 **TOTAL VOLUME PURGED:** ~ 3.96 **gal**

APPROXIMATE PURGE RATE: 500 **ml/min** **PURGED/SAMPLED BY:** MAC

WEATHER CONDITIONS: COLD

COMMENTS: ONE WELL VOLUME (4") IS 30.71. PURGING START TIME (PRIOR TO LOW FLOW) IS :55. END TIME IS 10:20. 30 GALLONS (1 WELL VOLUME) PURGED PRIOR TO LOW FLOW. WATER NEVER CLEARED, WELL PURGED DRY. BEGAN LOW-FLOW AT 15:50 AFTER WATER LEVEL RECOVERED TO 32.70FT. THE PURGE RATE WAS REDUCED TO 200ml/min TO MINIMIZE DRAWDOWN.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4"	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	17.90	ft TOR
SAMPLING DEVICE:	peristaltic pump	~~**DEPTH TO PUMP:**~~ Well Depth	29.84	ft TOR
DATE:	2/2/04	**FEET OF WATER IN LINE:**	11.94	feet
WELL I.D.:	E-29	**VOLUME OF WATER IN LINE:**	0.03	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	18.23	5.57	0.124	12.63	0.49	74	237
5	18.39	5.95	0.120	13.28	0.00	8	215
10	18.52	6.19	0.118	13.06	0.00	0	199
15	18.57	6.23	0.117	13.03	0.00	0	197
20	18.60	6.29	0.117	13.03	0.00	0	194
25	18.63	6.28	0.117	13.00	0.00	0	193
30	18.66	6.31	0.117	13.03	0.00	0	193

PURGE START TIME: 13:20 **PURGE END TIME:** 13:50 **TOTAL VOLUME PURGED:** ~ 1.62 **gal**

APPROXIMATE PURGE RATE: 350 **ml/min** **PURGED/SAMPLED BY:** MAL

WEATHER CONDITIONS: 30's, partly cloudy

COMMENTS: After 5 min purging, flow rate reduced to 175 ml/min to minimize drawdown.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4"	inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	17.53	ft TOR
SAMPLING DEVICE:	peristaltic pump	~~DEPTH TO PUMP~~: well depth	27.00	ft TOR
DATE:	2/2/04	FEET OF WATER IN LINE:	9.47	feet
WELL I.D.:	E-48	VOLUME OF WATER IN LINE:	0.02	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	17.77	4.89	0.302	12.53	0.00	0	260
5	17.86	4.81	0.305	13.68	0.00	0	274
10	18.02	4.75	0.306	14.18	0.00	0	282
15	18.14	4.65	0.313	14.16	0.00	0	285
20	18.20	4.57	0.320	14.22	0.00	0	288
25	18.24	4.58	0.320	14.26	0.00	0	288
30	18.32	4.53	0.319	14.25	0.00	0	286

PURGE START TIME: 14:50 PURGE END TIME: 15:20 TOTAL VOLUME PURGED: ~1.45 gal

APPROXIMATE PURGE RATE: 250 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: 30's, partly cloudy

COMMENTS: THE PURGE RATE WAS REDUCED TO 150 ml/min AFTER 10 MINUTES OF PURGING TO MINIMIZE DRAWDOWN.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4" inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	17.26 ft TOR
SAMPLING DEVICE:	peristaltic pump	~~DEPTH TO PUMP:~~ Well depth	30 ft TOR
DATE:	2/3/04	FEET OF WATER IN LINE:	12.74 feet
WELL I.D.:	W-2A	VOLUME OF WATER IN LINE:	0.03 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	17.31	10.04	0.144	12.39	0.00	OUT OF RANGE	-129
5	17.39	9.75	0.142	13.91	0.00	31	-108
10	17.45	9.70	0.142	13.99	0.00	11	-105
15	17.50	9.66	0.142	13.60	0.00	7	-100
20	17.50	9.66	0.142	13.53	0.00	4	-100
25	17.51	9.61	0.142	13.49	0.00	1	-93
30	17.52	9.64	0.141	13.50	0.00	0	-93
35	17.54	9.70	0.141	13.51	0.00	.1	-93

PURGE START TIME: 14:30 PURGE END TIME: 15:05 TOTAL VOLUME PURGED: ~ 2.22 gal

APPROXIMATE PURGE RATE: 400 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: rainy / Cold

COMMENTS: THE PURGE RATE WAS REDUCED TO 175 ml/min AFTER 10 MINUTES OF PURGING TO MINIMIZE DRAWDOWN

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/2"	inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	16.10	ft TOR
SAMPLING DEVICE:	Grundfos sub pump	~~DEPTH TO PUMP:~~ Well Depth	63.20	ft TOR
DATE:	1/28/04	FEET OF WATER IN LINE:	47.10	feet
WELL I.D.:	E-61	VOLUME OF WATER IN LINE:	1.93	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (µS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	17.98	6.35	93	14.0	12.1	out of range	-75
5	18.04	6.95	90	14.4	9.4	"	-130
10	18.07	7.11	90	14.5	9.2	"	-146
15	18.09	7.20	91	14.6	8.5	"	-154
20	18.12	7.33	90	14.8	6.4	"	-165
25	18.16	7.36	90	14.8	6.3	"	-170
30	18.18	7.38	90	14.8	6.6	"	-173

PURGE START TIME: 10:10 PURGE END TIME: 10:40 TOTAL VOLUME PURGED: ~ 3.96 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: ______

WEATHER CONDITIONS: very cold, windy

COMMENTS: ______

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: Grundfos Pump 500

DATE: 1 / 26 / 04

WELL I.D.: E-12

TUBING DIAMETER: 1/2 inches

DEPTH TO WATER: 18.71 ft TOR

~~DEPTH TO PUMP:~~ Well Depth: 35.00 ft TOR

FEET OF WATER IN LINE: 16.29 feet

VOLUME OF WATER IN LINE: 0.67 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	18.71	4.60	52	12.4	15.1	108	280
5	20.40	4.53	47	15.5	10.8	31.9	289
10	20.47	4.53	51	15.8	9.6	104	268
15	20.49	4.61	50	16.3	9.4	90.8	240
20	20.50	4.70	50	17.1	7.6	65.9	217
25	20.54	4.77	50	16.6	7.4	64.6	209
30	20.49	4.77	50	16.6	7.5	64.7	202
35	20.45	4.81	50	16.3	6.2	74.8	198
40	20.49	4.86	50	16.9	6.0	75.0	190
45	20.53	4.82	49	17.3	6.0	75.3	193

PURGE START TIME: 11:05 PURGE END TIME: 11:50 TOTAL VOLUME PURGED: ~ 5.94 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: Cold / Light, Freezing Rain

COMMENTS:

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/2	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	24.00	ft TOR
SAMPLING DEVICE:	Grundfos sub pump	~~**DEPTH TO PUMP:**~~ Well Depth	80	ft TOR
DATE:	1/26/04	**FEET OF WATER IN LINE:**	56	feet
WELL I.D.:	E-63	**VOLUME OF WATER IN LINE:**	2.30	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (mS/M)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	24.03	7.29	42	13.7	13.5	out of range	-133
5	24.07	7.42	42	17.3	8.8	"	-140
10	24.08	7.41	42	16.4	5.6	"	-179
15	24.09	7.41	42	16.3	5.3	"	-184
20	24.11	7.46	42	16.2	6.5	"	-187
25	24.13	7.50	42	15.4	0.0	"	-187
30	24.08	7.47	43	15.4	0.0	"	-174
35	24.08	7.48	43	15.8	0.0	"	-169
40	24.08	7.49	43	16.4	0.0	"	-168

PURGE START TIME: 14:05 **PURGE END TIME:** 14:45 **TOTAL VOLUME PURGED:** ~ 5.28 gal

APPROXIMATE PURGE RATE: 500 ml/min **PURGED/SAMPLED BY:** MAL

WEATHER CONDITIONS: cold/freezing rain

COMMENTS:

3785

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules Jefferson	**TUBING DIAMETER:**	1/2"	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	8.86	ft TOR
SAMPLING DEVICE:	Grundfos sub pump	~~**DEPTH TO PUMP:**~~ well depth	57.30	ft TOR
DATE:	1/27/04	**FEET OF WATER IN LINE:**	48.44	feet
WELL I.D.:	E-59	**VOLUME OF WATER IN LINE:**	1.99	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (sM /)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	8.97	6.05	88	14.0	9.3	out of range	55
5	8.97	6.80	93	14.6	7.4	"	12
10	8.97	7.03	93	14.5	6.5	"	-10
15	8.98	7.07	92	15.9	5.7	"	-14
20	8.99	7.11	92	16.0	5.2	"	-21
25	8.98	7.14	92	16.0	4.5	"	-29
30	8.98	7.17	92	16.0	3.9	"	-36
35	9.00	7.19	92	16.1	3.6	"	-39
40	9.02	7.21	92	16.0	3.5	"	-41
45	9.01	7.22	91	16.0	3.3	"	-40

PURGE START TIME: 8:30 **PURGE END TIME:** 9:15 **TOTAL VOLUME PURGED:** ~ 5.94 gal

APPROXIMATE PURGE RATE: 500 ml/min **PURGED/SAMPLED BY:** MAL

WEATHER CONDITIONS: cold, icy

COMMENTS: Measured well depth 57.30

NO LNAPL PRESENT IN WELL

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/2 inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	13.97 ft TOR
SAMPLING DEVICE:	Grundfos Pump	~~DEPTH TO PUMP~~ Well Depth:	64.17 ft TOR
DATE:	1/27/04	FEET OF WATER IN LINE:	50.20 feet
WELL I.D.:	E-60	VOLUME OF WATER IN LINE:	2.06 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (ms/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	13.99	7.55	82	15.2	10.5	OUT OF RANGE	-79
5	13.94	7.16	87	16.1	5.1	"	-94
10	13.98	7.21	86	16.3	4.1	"	-101
15	13.99	7.25	85	16.2	3.3	"	-107
20	13.99	7.27	85	16.3	3.1	"	-109
25	13.99	7.30	84	16.2	2.9	"	-111
30	13.99	7.31	84	16.2	2.7	"	-113
35	13.99	7.32	83	16.1	2.7	"	-115

PURGE START TIME: 10:35 PURGE END TIME: 11:10 TOTAL VOLUME PURGED: ~ 4.62 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: cold, icy, steady rain

COMMENTS: Measured well depth 64.17

No LNAPL present in well

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: Grundfos sub pump

DATE: 1/27/04

WELL I.D.: E-13D

TUBING DIAMETER: 1/2" inches

DEPTH TO WATER: 22.03 ft TOR

~~DEPTH TO PUMP~~ Well depth: 68.99 ft TOR

FEET OF WATER IN LINE: 46.96 feet

VOLUME OF WATER IN LINE: 1.93 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	22.20	7.20	81	13.7	14.0	out of range	-53
5	22.14	7.43	85	15.2	7.5	"	-65
10	22.17	7.38	86	15.2	6.0	"	-69
20	22.18	7.39	86	15.5	5.9	"	-67
25	22.19	7.43	86	15.6	5.8	"	-64
30	22.19	7.44	86	15.8	5.4	"	-62

PURGE START TIME: 13:00 PURGE END TIME: 13:30 TOTAL VOLUME PURGED: ~ 3.96 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MRC

WEATHER CONDITIONS: cold rainy

COMMENTS: Measured well depth 68.99

No LNAPLs present.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	5.85 ft TOR
SAMPLING DEVICE:	peristaltic pump	~~DEPTH TO PUMP:~~ well depth	26.38 ft TOR
DATE:	1/27/04	**FEET OF WATER IN LINE:**	20.53 feet
WELL I.D.:	E-49	**VOLUME OF WATER IN LINE:**	0.05 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	7.48	8.13	73	5.4	19.00	OUT OF RANGE	138
5	11.64	8.55	77	4.9	17.30	772	136
10	12.10	8.60	74	7.0	14.0	684	136
15	12.94	8.36	76	8.8	12.3	771	138
20	14.20	7.99	72	9.9	12.0	OUT OF RANGE	141
25	14.92	7.81	72	8.7	12.7	OUT OF RANGE	142
30	14.39	7.84	75	8.5	12.3	OUT OF RANGE	142
35	14.54	7.91	76	7.8	12.7	OUT OF RANGE	141

PURGE START TIME: 16:25 **PURGE END TIME:** 17:00 **TOTAL VOLUME PURGED:** ~ 1.12 gal

APPROXIMATE PURGE RATE: 250 ml/min **PURGED/SAMPLED BY:**

WEATHER CONDITIONS: cold, SNOW

COMMENTS: AFTER 5 MINUTES OF PURGING, THE FLOW RATE WAS REDUCED TO 100 ML/MIN TO MINIMIZE DRAWDOWN OF THE ~~WATER~~. NO LNAPL WAS PRESENT IN THIS WELL. THE MEASURED WELL DEPTH WAS 26.38 FT.

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: submersible whale pump
DATE: 2/4/04
WELL I.D.: E-47D

TUBING DIAMETER: 3/8" inches
DEPTH TO WATER: 18.30 ft TOR
~~DEPTH TO PUMP~~ Well Depth: 60.10 ft TOR
FEET OF WATER IN LINE: 41.8 feet
VOLUME OF WATER IN LINE: 0.21 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing) x .65

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	18.40	7.21	0.147	12.79	1.60	130	6
5	18.42	9.08	0.154	13.77	0.00	49	-69
10	18.40	9.24	0.154	13.72	0.00	11	-81
15	18.42	9.42	0.154	13.72	0.00	10	-97
20	18.42	9.49	0.154	13.70	0.00	0	-103
25	18.44	9.51	0.152	13.75	0.00	0	-106
30	18.45	9.54	0.150	13.77	0.00	0	-110

PURGE START TIME: 9:15 PURGE END TIME: 9:45 TOTAL VOLUME PURGED: ~ 3.96 gal
APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAL
WEATHER CONDITIONS: cold
COMMENTS: One well volume (27.17). Begin purging one well volume at 9:05. End time 9:09. Only purged 5 gallons - water was clear. (4" [illegible] well)

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4	inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	7.99	ft TOR
SAMPLING DEVICE:	peristaltic pump	~~DEPTH TO PUMP:~~ well depth	24.88	ft TOR
DATE:	2/4/04	FEET OF WATER IN LINE:	16.89	feet
WELL I.D.:	MW-F1	VOLUME OF WATER IN LINE:	0.04	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (mS/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	8.37	6.2	0.18	13.8	3.53	93	317
5	8.44	5.9	0.18	13.6	1.46	65	305
10	8.51	5.9	0.18	13.9	0.82	51	295
15	8.57	6.0	0.18	14.0	1.23	44	291
20	8.59	6.0	0.18	13.8	1.25	34	284
25	8.60	6.1	0.18	13.8	1.19	33	279
30	8.62	6.1	0.18	13.9	1.18	33	277

PURGE START TIME: 12:05 PURGE END TIME: 12:35 TOTAL VOLUME PURGED: ~1.98 gal

APPROXIMATE PURGE RATE: 250 ml/min PURGED/SAMPLED BY: MAL

WEATHER CONDITIONS: cold / Partly cloudy

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: Whale Pump (500)

DATE: 2/5/04

WELL I.D.: E-28D

TUBING DIAMETER: 3/8 inches

DEPTH TO WATER: 17.33 ft TOR

~~DEPTH TO PUMP:~~ Well Depth: 55.60 ft TOR

FEET OF WATER IN LINE: 38.27 feet

VOLUME OF WATER IN LINE: 0.19 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

1st well volume = 6.12 gal (2" well)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	17.59	6.87	0.15	12.5	1.56	300	4
5	17.53	7.46	0.15	13.7	0.92	480	-47
10	17.53	7.58	0.15	14.0	0.74	280	-77
15	17.54	7.51	0.15	14.2	0.73	240	-76
20	17.53	7.56	0.15	14.2	0.72	210	-90
25	17.53	7.66	0.14	14.2	0.53	130	-105
30	17.53	7.65	0.14	14.2	0.46	89	-109
35	17.53	7.67	0.14	14.2	0.42	65	-115
40	17.53	7.68	0.14	14.2	0.40	69	-117
45	17.54	7.69	0.14	14.2	0.38	70	-120

PURGE START TIME: 8:50 PURGE END TIME: 9:35 TOTAL VOLUME PURGED: ~5.94 gal

APPROXIMATE PURGE RATE: 500 ml/min PURGED/SAMPLED BY: MAC

WEATHER CONDITIONS: Cold/Partly cloudy

COMMENTS: Began purging 1st well ~~[illegible]~~ volume at 8:40am
End purging 1st well volume at 8:47am

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	19.08 ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	32.00 ft TOR
DATE:	1/29/04	**FEET OF WATER IN LINE:**	12.92 feet
WELL I.D.:	E-14	**VOLUME OF WATER IN LINE:**	0.030 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	19.09	5.45	62	9.4	9.6	0	269
10	19.10	5.30	62	10.4	6.6	0	283
15	19.11	5.14	62	10.5	6.4	0	286
20	19.11	5.10	61	10.6	5.7	0	287
25	19.11	5.10	61	10.6	5.7	0	287
30	19.12	5.09	61	10.6	5.7	0	287

PURGE START TIME: 1435 **PURGE END TIME:** 1505 **TOTAL VOLUME PURGED:** ~0.95 gal

APPROXIMATE PURGE RATE: 120 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold/clear

COMMENTS: Total depth =

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4	inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	25.31	ft TOR
SAMPLING DEVICE:	peristaltic pump	DEPTH TO PUMP:	40	ft TOR
DATE:	1/27/04	FEET OF WATER IN LINE:	14.69	feet
WELL I.D.:	E-23	VOLUME OF WATER IN LINE:	0.034	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	25.34	5.03	69.4	6.82	0.00	0	208
10	25.34	4.71	69.7	7.34	0.00	0	229
15	25.35	4.28	69.9	7.64	0.00	0	237
20	25.35	4.27	69.9	7.70	0.00	0	238
25	25.35	4.28	70.1	7.70	0.00	0	238
30	25.36	4.28	70.1	7.71	0.00	0	239
35	25.36	4.27	70.0	7.71	0.00	0	239

PURGE START TIME: 1600 PURGE END TIME: 1635 TOTAL VOLUME PURGED: ~1.11 gal

APPROXIMATE PURGE RATE: 120 ml/min PURGED/SAMPLED BY: CGK

WEATHER CONDITIONS: cold / snow flurry

COMMENTS: Total depth = 44.9 ft TOR

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CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	17.20 ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	32 ft TOR
DATE:	1 / 30 / 04	**FEET OF WATER IN LINE:**	14.80 feet
WELL I.D.:	E-24	**VOLUME OF WATER IN LINE:**	0.034 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	17.25	5.22	93	10.3	8.5	0	269
10	17.24	5.28	93	12.3	5.2	0	280
15	17.24	5.32	98	12.5	4.0	0	286
20	17.23	5.37	96	12.9	3.5	0	285
25	17.23	5.40	97	12.9	3.4	0	285
30	17.23	5.40	97	12.9	3.4	0	285
35	17.23	5.41	96	12.8	3.4	0	285

PURGE START TIME: 1010 **PURGE END TIME:** 1045 **TOTAL VOLUME PURGED:** ~1.39 gal

APPROXIMATE PURGE RATE: 150 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold / overcast

COMMENTS: total depth = 32.46

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	14.51 ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	26 ft TOR
DATE:	2/4/04	**FEET OF WATER IN LINE:**	11.49 feet
WELL I.D.:	E-27	**VOLUME OF WATER IN LINE:**	0.026 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	14.55	5.20	0.31	13.10	9.1	above detection limits	-57
10	14.56	5.22	0.32	14.21	6.1	610.0	-68
15	14.56	5.24	0.32	14.40	5.6	110.0	-75
20	14.56	5.23	0.32	14.41	5.1	0	-81
25	14.57	5.22	0.32	14.40	4.7	0	-87
30	14.57	5.23	0.32	14.40	4.6	0	-87
35	14.57	5.23	0.32	14.40	4.6	0	-88

PURGE START TIME: 1025 **PURGE END TIME:** 1100 **TOTAL VOLUME PURGED:** ~1.39 gal

APPROXIMATE PURGE RATE: 150 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold/overcast

COMMENTS: total depth = 26.80

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 2/2/04
WELL I.D.: E-34

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 3.50 ft TOR
DEPTH TO PUMP: 9 ft TOR
FEET OF WATER IN LINE: 5.5 feet
VOLUME OF WATER IN LINE: 0.013 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	3.52	2.34	1.9	7.0	14.8	above detection limits	88
10	3.52	2.88	1.9	10.6	14.2	820	88
15	3.52	2.79	1.9	11.7	12.7	110	85
20	3.53	2.74	1.9	12.3	10.8	0	84
25	3.53	2.74	1.9	12.3	10.8	0	84
30	3.53	2.74	1.9	12.2	10.7	0	84

PURGE START TIME: 1430 **PURGE END TIME:** 1500 **TOTAL VOLUME PURGED:** ~1.19 gal
APPROXIMATE PURGE RATE: 150 ml/min **PURGED/SAMPLED BY:** CGK
WEATHER CONDITIONS: cool/overcast
COMMENTS: Total depth = 9.65 ft-tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 1 / 27 / 04
WELL I.D.: E-31

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 7.85 ft TOR
DEPTH TO PUMP: 27 ft TOR
FEET OF WATER IN LINE: 19.15 feet
VOLUME OF WATER IN LINE: 0.044 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
3	7.85	11.84	0.173	10.74	0.00	above detection limits	-254
6	7.93	12.01	0.167	10.93	0.00	" "	-262
9	7.93	12.34	0.150	11.19	-0.00	" "	-283
12	7.94	12.08	0.134	11.65	0.00	490	-283
15	7.93	12.16	0.130	12.12	0.00	340	-279
18	7.91	12.38	0.134	11.01	0.00	250	-301
21	7.91	12.45	0.134	10.65	0.00	190	-307
24	7.91	12.46	0.134	10.64	0.00	190	-309
27	7.91	12.46	0.134	10.64	0.00	190	-309
30	7.91	12.45	0.134	10.65	0.00	170	-287
33	7.91	12.44	0.133	10.64	0.00	120	-287
36	7.91	12.44	0.133	10.64	0.00	120	-307
39	7.91	12.45	0.134	10.63	0.00	120	-307
42	7.91	12.45	0.134	10.63	0.00	120	-307
45	7.91	12.45	0.134	10.64	0.00	120	-307

PURGE START TIME: 0830 **PURGE END TIME:** 0915 **TOTAL VOLUME PURGED:** ~1.43 gal
APPROXIMATE PURGE RATE: 120 ml/min **PURGED/SAMPLED BY:** CGK
WEATHER CONDITIONS: cold / overcast
COMMENTS: Strong sulfur odor ; No LNAPL present in well

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	7.56 ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	30 ft TOR
DATE:	1/27/04	**FEET OF WATER IN LINE:**	22.44 feet
WELL I.D.:	E-33	**VOLUME OF WATER IN LINE:**	0.052 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	7.56	9.61	0.278	10.11	0.00	150	-139
10	7.56	9.66	0.275	9.91	0.00	140	-140
15	7.56	9.54	0.387	9.86	0.00	310	-128
20	7.56	9.44	0.399	9.84	0.00	300	-115
25	7.56	9.17	0.560	10.06	0.00	320	-92
30	7.56	8.73	0.886	10.64	0.00	410	-61
35	7.56	8.72	0.959	11.01	0.83	410	-59
40	7.56	8.67	0.981	11.88	2.14	410	-53
45	7.56	8.64	1.05	12.56	3.82	410	-50
50	7.56	8.64	1.04	12.56	3.84	410	-49
55	7.56	8.65	1.04	12.57	3.84	410	-50
60	7.56	8.65	1.04	12.57	3.83	410	-50

PURGE START TIME: 1050 **PURGE END TIME:** 1150 **TOTAL VOLUME PURGED:** ~1.90 **gal**

APPROXIMATE PURGE RATE: 120 **ml/min** **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold/rain

COMMENTS: total depth = 31.97 ft-tor;

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CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	10.49	ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	21.90	ft TOR
DATE:	1 / 28 / 04	**FEET OF WATER IN LINE:**	11.41	feet
WELL I.D.:	E-35	**VOLUME OF WATER IN LINE:**	0.026	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	10.49	6.61	0.095	8.23	0.00	0	122
10	10.50	7.48	0.094	8.36	0.00	0	65
15	10.50	8.00	0.094	8.23	0.00	0	27
20	10.50	8.17	0.095	8.23	0.00	0	10
25	10.50	8.26	0.094	8.24	0.00	0	4
30	10.50	8.40	0.094	8.49	0.00	0	-8
35	10.51	8.39	0.094	8.48	0.00	0	-9
40	10.51	8.40	0.094	8.49	0.00	0	-10
45	10.51	8.40	0.093	8.49	0.00	0	-10

PURGE START TIME: 0940 **PURGE END TIME:** 1025 **TOTAL VOLUME PURGED:** ~ 1.78 gal

APPROXIMATE PURGE RATE: 150 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold / snow flurries

COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 1/28/04
WELL I.D.: E-37

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 14.16 ft TOR
DEPTH TO PUMP: 25 ft TOR
FEET OF WATER IN LINE: 10.84 feet
VOLUME OF WATER IN LINE: 0.025 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	14.21	5.43	0.095	12.05	0.00	above detection limit	222
10	14.20	4.95	0.092	11.76	0.00	"	268
15	14.19	5.02	0.091	12.13	0.00	"	269
20	14.19	5.11	0.091	12.26	0.00	"	268
25	14.19	5.23	89.5	12.27	0.00	310	261
30	14.19	5.24	89.6	12.26	0.00	0	262
35	14.18	5.25	89.5	12.27	0.00	0	262
40	14.18	5.24	89.5	12.27	0.00	0	262

PURGE START TIME: 1255 PURGE END TIME: 1335 TOTAL VOLUME PURGED: ~1.59 gal
APPROXIMATE PURGE RATE: 150 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: cold/snow flurries
COMMENTS: total depth = 20.24 ft-tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	17.24 ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	26 ft TOR
DATE:	2 / 2 / 04	**FEET OF WATER IN LINE:**	8.76 feet
WELL I.D.:	E-40	**VOLUME OF WATER IN LINE:**	0.020 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	17.26	3.51	0.15	12.9	19.1	122	-69
10	17.26	3.40	0.15	13.1	13.8	177	-80
15	17.26	3.30	0.15	13.4	9.5	0	-90
20	17.27	3.28	0.15	13.4	8.5	0	-94
25	17.27	3.29	0.15	13.5	8.4	0	-95
30	17.27	3.29	0.15	13.5	8.4	0	-95

PURGE START TIME: 1235 **PURGE END TIME:** 1305 **TOTAL VOLUME PURGED:** ~ 1.59 gal

APPROXIMATE PURGE RATE: 200 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cool / overcast

COMMENTS: total depth = 26.40 ft-tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4 inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	21.06 ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	28 ft TOR
DATE:	1/26/04	**FEET OF WATER IN LINE:**	6.94 feet
WELL I.D.:	E-43	**VOLUME OF WATER IN LINE:**	0.016 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	21.06	4.51	30.7	9.45	0.00	0	298
3	21.10	4.69	30.9	9.92	0.00	0	287
6	21.10	4.81	30.7	10.46	0.00	0	264
9	21.17	4.89	30.4	11.32	0.00	0	260
12	21.11	5.05	30.2	11.77	0.00	0	249
15	21.11	5.34	30.2	12.14	0.00	0	247
18	21.11	5.45	30.2	12.14	0.00	0	243
21	21.12	5.66	30.0	12.15	0.00	0	228
24	21.12	5.69	30.1	12.15	0.00	0	229
27	21.12	5.69	30.0	12.15	0.00	0	229
30	21.12	5.69	30.0	12.14	0.00	0	221
33	21.12	5.70	30.1	12.15	0.00	0	228
36	21.13	5.69	30.0	12.15	0.00	0	228

PURGE START TIME: 1625 **PURGE END TIME:** 1701 **TOTAL VOLUME PURGED:** ~0.95 gal

APPROXIMATE PURGE RATE: 100 ml/min **PURGED/SAMPLED BY:** CGA

WEATHER CONDITIONS: cold/overcast

COMMENTS:

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	13.35	ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	22	ft TOR
DATE:	1/30/04	**FEET OF WATER IN LINE:**	8.65	feet
WELL I.D.:	E-51	**VOLUME OF WATER IN LINE:**	0.020	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	13.63	5.90	0.09	12.8	9.4	0	161
10	13.71	5.68	0.09	12.6	6.0	0	186
15	13.73	5.61	0.09	12.6	5.0	0	204
20	13.76	5.61	0.09	12.5	4.5	0	214
25	13.84	5.61	0.09	12.5	0	0	219
30	13.86	5.60	0.09	12.6	0	0	220
35	13.89	5.61	0.09	12.6	0	0	220

PURGE START TIME: 1520 **PURGE END TIME:** 1555 **TOTAL VOLUME PURGED:** ~0.92 gal

APPROXIMATE PURGE RATE: 100 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold/overcast

COMMENTS: total depth = 23.6 ft tor

23.6

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4 inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	17.68 ft TOR
SAMPLING DEVICE:	peristaltic pump	DEPTH TO PUMP:	27.0 ft TOR
DATE:	1/26/04	FEET OF WATER IN LINE:	9.32 feet
WELL I.D.:	E-52	VOLUME OF WATER IN LINE:	0.021 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S /m)	TEMPER-ATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	17.68	4.69	89.3	11.75	0.00	0	334
3	17.64	4.88	88.0	12.59	0.00	0	333
6	17.86	4.97	86.5	13.51	0.00	0	335
9	17.88	4.95	86.1	13.71	0.00	0	335
12	17.89	4.95	86.0	13.86	0.00	0	334
15	17.90	4.84	85.9	13.90	0.00	0	334
18	17.90	4.82	85.8	13.89	0.00	0	332
21	17.90	4.83	85.8	13.88	0.00	0	332
24	17.90	4.81	85.9	13.89	0.00	0	332
27	17.90	4.82	86.0	13.89	0.00	0	332
30	17.90	4.82	86.0	13.89	0.00	0	332
33	17.90	4.82	85.9	13.90	0.00	0	332

PURGE START TIME: 1400 PURGE END TIME: 1433 TOTAL VOLUME PURGED: ~1.74 gal

APPROXIMATE PURGE RATE: 200 ml/min PURGED/SAMPLED BY: CGK

WEATHER CONDITIONS: cold / freezing rain

COMMENTS:

f52/corp

24.20 4.1.14,11

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 2/13/04
WELL I.D.: E-53

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 13.78 ft TOR
DEPTH TO PUMP: 20 ft TOR
FEET OF WATER IN LINE: 6.22 feet
VOLUME OF WATER IN LINE: 0.14 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	13.81	4.19	0.38	11.00	12.8	618.0	127
10	13.81	4.50	0.38	11.56	10.0	408.0	111
15	13.82	4.62	0.38	12.01	7.5	107.4	96
20	13.83	5.04	0.38	12.01	7.4	0	84
25	13.83	5.04	0.38	12.00	7.4	0	84
30	13.83	5.03	0.38	12.01	7.4	0	85

PURGE START TIME: 1400 PURGE END TIME: 1430 TOTAL VOLUME PURGED: ~1.19 gal
APPROXIMATE PURGE RATE: 150 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: cool/rain
COMMENTS: total depth = 21.76 ft-tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 1/30/04
WELL I.D.: E-59

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 17.84 ft TOR
DEPTH TO PUMP: 27 ft TOR
FEET OF WATER IN LINE: 9.16 feet
VOLUME OF WATER IN LINE: 0.021 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	17.84	6.05	73	10.3	12.5	59.0	198
10	17.85	6.16	66	10.1	6.6	0	190
15	17.86	6.22	64	10.1	5.3	0	189
20	17.86	6.27	64	10.0	4.4	0	187
25	17.86	6.28	64	10.0	4.3	0	187
30	17.86	6.27	64	10.0	4.3	0	186

PURGE START TIME: 0845 PURGE END TIME: 0915 TOTAL VOLUME PURGED: ~1.19 gal
APPROXIMATE PURGE RATE: 150 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: Cold/overcast
COMMENTS: Depth to water = 28.40 ft tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: peristaltic pump

DATE: 1 / 30 / 04

WELL I.D.: E-55

TUBING DIAMETER: 1/4 inches

DEPTH TO WATER: 11.22 ft TOR

DEPTH TO PUMP: 20 ft TOR

FEET OF WATER IN LINE: 8.78 feet

VOLUME OF WATER IN LINE: 0.020 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	11.22	7.48	0.13	12.2	[illegible]	171.0	-151
10	11.30	7.63	0.13	11.9	[illegible]	132.0	-162
15	11.30	7.66	0.13	12.0	4.6	145.0	-167
20	12.24	7.66	0.13	12.0	0.0	145.0	-168
25	12.30	7.67	0.13	12.0	0.0	74.7	-170
30	12.51	7.68	0.13	11.9	0.0	0	-170
35	12.75	7.68	0.13	11.9	0.0	0	-170
40	12.78	7.67	0.13	11.8	0.0	0	-170

PURGE START TIME: 1400 **PURGE END TIME:** 1440 **TOTAL VOLUME PURGED:** ~1.06 gal

APPROXIMATE PURGE RATE: 100 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS:

COMMENTS: Total depth = 20.15

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	10.07	ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	18	ft TOR
DATE:	2/13/04	**FEET OF WATER IN LINE:**	7.93	feet
WELL I.D.:	E-56	**VOLUME OF WATER IN LINE:**	0.018	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	10.10	4.17	0.52	9.75	16.2	303.0	-62
10	10.11	4.40	0.53	11.41	13.1	180.4	-80
15	10.11	4.45	0.53	11.68	6.9	0	-86
20	10.12	4.48	0.63	11.94	5.7	0	-86
25	10.12	4.49	0.63	11.95	5.5	0	-86
30	10.13	4.50	0.63	11.95	5.5	0	-86
35	10.14	4.50	0.63	11.94	5.5	0	-87

PURGE START TIME: 1525 **PURGE END TIME:** 1600 **TOTAL VOLUME PURGED:** ~ 1.39 gal

APPROXIMATE PURGE RATE: 150 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cool/rain

COMMENTS: total depth = 18.20 ft-tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	**TUBING DIAMETER:**	1/4	inches
PROJECT NO.:	01305.40	**DEPTH TO WATER:**	10.61	ft TOR
SAMPLING DEVICE:	peristaltic pump	**DEPTH TO PUMP:**	19	ft TOR
DATE:	1/29/04	**FEET OF WATER IN LINE:**	8.39	feet
WELL I.D.:	E-57	**VOLUME OF WATER IN LINE:**	0.019	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	10.65	6.64	96	11.6	5.2	0	137
10	10.64	6.68	95	11.6	4.6	0	131
15	10.63	6.74	96	11.9	4.2	0	122
20	10.62	6.79	96	12.1	4.1	0	114
25	10.62	6.80	96	12.1	4.1	0	114
30	10.62	6.80	96	12.1	4.1	0	113
~~35~~							

PURGE START TIME: 1135 **PURGE END TIME:** 1205 **TOTAL VOLUME PURGED:** ~0.95 gal

APPROXIMATE PURGE RATE: 120 ml/min **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS:

COMMENTS: total depth: 21.12 ft-tor

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4 inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	21.25 ft TOR
SAMPLING DEVICE:	peristaltic pump	DEPTH TO PUMP:	28 ft TOR
DATE:	1/26/04	FEET OF WATER IN LINE:	6.75 feet
WELL I.D.:	E-58	VOLUME OF WATER IN LINE:	0.016 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	21.25	6.61	31.6	11.13	4.50	0	274
3	24.60	7.06	31.3	11.30	3.88	0	275
6	24.66	7.60	31.3	11.32	3.89	0	266
9	24.61	7.16	34.2	11.32	6.05	0	274
12	24.58	6.90	36.8	11.33	6.10	0	274
15	24.53	6.87	36.8	11.33	6.11	0	274
18	24.52	6.86	36.8	11.33	6.12	0	274
21	24.52	6.86	36.8	11.32	6.11	0	274
24	24.51	6.86	36.8	11.32	6.11	0	274
27	24.51	6.86	36.9	11.32	6.11	0	274
30	24.51	6.85	36.8	11.32	6.11	0	274

PURGE START TIME: 1130 PURGE END TIME: 1200 TOTAL VOLUME PURGED: ~0.81 gal

APPROXIMATE PURGE RATE: 125 ml/min PURGED/SAMPLED BY: CGK

WEATHER CONDITIONS: cold / freezing rain

COMMENTS: cut flow rate back to 100 mL/min after 3 minutes

?7;

f52/corp

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson

PROJECT NO.: 01305.40

SAMPLING DEVICE: peristaltic pump

DATE: 1/29/04

WELL I.D.: W-15

TUBING DIAMETER: 1/4 inches

DEPTH TO WATER: 5.50 ft TOR

DEPTH TO PUMP: 18 ft TOR

FEET OF WATER IN LINE: 12.5 feet

VOLUME OF WATER IN LINE: 0.29 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S / m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	5.51	6.71	0.27	5.2	7.4	0	-31
10	5.51	6.73	0.27	5.7	6.9	0	-34
15	5.51	6.80	0.27	5.8	5.6	0	-46
20	5.51	6.82	0.27	6.0	5.0	0	-50
25	5.51	6.82	0.27	6.1	5.0	0	-51
30	5.51	6.82	0.27	6.1	5.1	0	-51

PURGE START TIME: 1540 **PURGE END TIME:** 1610 **TOTAL VOLUME PURGED:** ~0.95 **gal**

APPROXIMATE PURGE RATE: 120 **ml/min** **PURGED/SAMPLED BY:** CGK

WEATHER CONDITIONS: cold/clear

COMMENTS: Total depth = 19.20

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules/Jefferson	TUBING DIAMETER:	1/4 inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	8.74 ft TOR
SAMPLING DEVICE:	peristaltic pump	DEPTH TO PUMP:	22 ft TOR
DATE:	2/4/04	FEET OF WATER IN LINE:	13.26 feet
WELL I.D.:	MW-F2	VOLUME OF WATER IN LINE:	0.030 gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	8.77	4.13	0.45	9.57	9.1	0	-86
10	8.77	4.46	0.50	10.47	6.6	0	-145
15	8.77	4.60	0.52	10.48	5.4	0	-153
20	8.76	4.91	0.53	10.48	5.3	0	-162
25	8.76	4.92	0.53	10.47	5.3	0	-162
30	8.76	4.92	0.53	10.48	5.2	0	-161

PURGE START TIME: 0850 PURGE END TIME: 0920 TOTAL VOLUME PURGED: ~1.59 gal

APPROXIMATE PURGE RATE: 200 ml/min PURGED/SAMPLED BY: CGK

WEATHER CONDITIONS: cold/overcast

COMMENTS: total depth = 24.60

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 1/30/04
WELL I.D.: MW-F3

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 10.20 ft TOR
DEPTH TO PUMP: 25 ft TOR
FEET OF WATER IN LINE: 14.80 feet
VOLUME OF WATER IN LINE: 0.034 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	10.23	5.41	0.16	11.3	18.5	0	263
10	10.23	5.35	0.16	9.9	10.1	0	275
15	10.22	5.33	0.16	9.6	7.4	0	276
20	10.22	5.32	0.16	9.5	6.0	0	279
25	10.22	5.32	0.16	9.6	0.0	0	279
30	10.22	5.32	0.16	9.7	0.0	0	280
35	10.22	5.32	0.16	9.7	0.0	0	280

PURGE START TIME: 1205 PURGE END TIME: 1240 TOTAL VOLUME PURGED: ~1.39 gal
APPROXIMATE PURGE RATE: 150 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: cold/overcast
COMMENTS: total depth = 27.19

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE: Hercules/Jefferson
PROJECT NO.: 01305.40
SAMPLING DEVICE: peristaltic pump
DATE: 2/4/04
WELL I.D.: MW-5

TUBING DIAMETER: 1/4 inches
DEPTH TO WATER: 8.47 ft TOR
DEPTH TO PUMP: 13 ft TOR
FEET OF WATER IN LINE: 4.53 feet
VOLUME OF WATER IN LINE: 0.010 gallons
(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	pH (s.u.)	SPECIFIC CONDUCTANCE (S/m)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
5	8.48	4.43	0.17	8.37	12.7	0	-121
10	8.48	4.98	0.17	9.21	8.1	0	-121
15	8.48	4.99	0.17	10.48	7.4	0	-140
20	8.47	6.05	0.18	10.47	6.5	0	-145
25	8.47	6.06	0.18	10.47	6.5	0	-145
30	8.47	6.05	0.18	10.48	6.4	0	-145

PURGE START TIME: 1405 PURGE END TIME: 1435 TOTAL VOLUME PURGED: ~1.59 gal
APPROXIMATE PURGE RATE: 200 ml/min PURGED/SAMPLED BY: CGK
WEATHER CONDITIONS: cold/overcast
COMMENTS: Total depth = 13.89

CUMMINGS RITER CONSULTANTS, INC.

WELL PURGING RECORD
LOW-FLOW SAMPLING METHOD

SITE:	Hercules - Jefferson	TUBING DIAMETER:	3/8 inches
PROJECT NO.:	01305.40	DEPTH TO WATER:	18.26' TOR ft TOR
SAMPLING DEVICE:	Whale Pump	DEPTH TO PUMP:	ft TOR
DATE:	2/11/04	FEET OF WATER IN LINE:	feet
WELL I.D.:	E-28D	VOLUME OF WATER IN LINE:	gallons

(0.005 gal/ft for 3/8" tubing, 0.0023 gal/ft for ¼" tubing)

ELAPSED TIME (min)	DEPTH TO WATER (ft TOR)	PH (s.u.)	SPECIFIC CONDUCTANCE (µS/cm)	TEMPERATURE (°C)	DISSOLVED OXYGEN (ppm)	TURBIDITY (NTU)	REDOX (mV)
0	16.34	4.91	1646	11.9	—	458	0.6
5	18.32	5.34	1586	11.8	—	431	-94
10	18.35	5.58	1574	12.4	—	394	-89
15	18.36	5.64	1564	12.7	—	140	-92
20	18.37	5.72	1577	13.6	—	40.4	-100
25	18.38	5.83	1571	13.6	—	16.5	-105
30	18.38	5.89	1554	13.2	—	8.28	-106
35	18.36	5.98	1544	13.6	—	4.92	-105
40	18.34	6.02	1546	13.4	—	3.35	-104

PURGE START TIME: 13:04 PURGE END TIME: ______ TOTAL VOLUME PURGED: ~ ______ gal

APPROXIMATE PURGE RATE: 200 ml/min PURGED/SAMPLED BY: CLN / CGK

WEATHER CONDITIONS: Sunny, 30's

COMMENTS: ______

f52/corn

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

ROJECT Hercules/Jefferson

SAMPLE ID E-12

PROJECT NO. 01305.40

WELL NO. E-12

SAMPLE DATE 1/26/04

SAMPLED BY MAL

SAMPLE TIME (START/END) 12:00/ 12:15

SAMPLE SEQUENCE NO. 1

SAMPLE COLLECTION EQUIPMENT Grundfos Pump with dedicated tubing

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 18.71 / 20.53

RECHARGE TIME 5 min

MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	4.82
Specific Conductance	~~mmho/cm~~ mS/m	49
Water Temperature	°C	17.3
Dissolved Oxygen	ppm	6.0
Redox	mV	193
Turbidity	NTU	25.3

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/26/04

VATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Slightly cloudy

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX VOC	40 mL	4	Y ☐	N ☑	Y ■	HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☑	Y ☐		N ■
APIX (diss) METALS	250 mL	1	Y ☑	N ☐	Y ■	HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☑	Y ☐		N ■
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS 8

FILTRATION METHOD .45 micron Filter

LABORATORY STL-Savannah

DELIVERED VIA FedEx

DATE 1/26/04

WEATHER CONDITIONS Cold / Freezing Rain

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson
SAMPLE ID E-58
PROJECT NO. 01305.40
WELL NO. E-58
SAMPLE DATE 1/26/04
SAMPLED BY CGK
SAMPLE TIME (START/END) 1200 / 1220
SAMPLE SEQUENCE NO. 2
SAMPLE COLLECTION EQUIPMENT peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 21.25 / 24.51
RECHARGE TIME 5 minutes
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.85
Specific Conductance	umho/cm	36.8
Water Temperature	°C	11.32
Dissolved Oxygen	ppm	6.11
Redox	mV	274
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/26/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ ___ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ ___ N ■
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD 0.45 micron filter
LABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/27/04
WEATHER CONDITIONS cold/freezing rain
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson

SAMPLE ID E-52

PROJECT NO. 01305.40

WELL NO. E-52

SAMPLE DATE 1/26/04

SAMPLED BY CGK

SAMPLE TIME (START/END) 1436 / 1455

SAMPLE SEQUENCE NO. 3

SAMPLE COLLECTION EQUIPMENT peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 17.68 / 17.71

RECHARGE TIME 5 min.

MEASURED FROM ☒ TOC ☐ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	4.82
Specific Conductance	umho/cm	85.9
Water Temperature	°C	13.90
Dissolved Oxygen	ppm	0.00
Redox	mV	332
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/26/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS 8

FILTRATION METHOD 0.45 micron filter

LABORATORY STL-Savannah

DELIVERED VIA FedEx

DATE 1/27/04

WEATHER CONDITIONS cold/ freezing rain

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-63
PROJECT NO.: 01305.40
WELL NO.: E-63
SAMPLE DATE: 1/26/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 14:50 / 15:10
SAMPLE SEQUENCE NO.: 4
SAMPLE COLLECTION EQUIPMENT: Grundfos Sub. Pump with Dedicated Tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 24.00 / 24.08
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.49
Specific Conductance	~~umho/cm~~ S/m	43
Water Temperature	°C	16.4
Dissolved Oxygen	ppm	0.0
Redox	mV	-168
Turbidity	NTU	out of range

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/26/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Very cloudy, Turbid

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ☑	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ☑	Y ☐ N ■
APIX (Diss) METALS	250 mL	1	Y ☑ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ☑	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE:
WEATHER CONDITIONS: cold / freezing rain
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-43
PROJECT NO.	01305.40	WELL NO.	E-43
SAMPLE DATE	1/26/04	SAMPLED BY	CGK
SAMPLE TIME (START/END)	1701 / 1730	SAMPLE SEQUENCE NO.	5

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 21.06 / 21.31

RECHARGE TIME: 5 min MEASURED FROM ☒ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	5.69
Specific Conductance	umho/cm	30.0
Water Temperature	°C	12.15
Dissolved Oxygen	ppm	0.00
Redox	mV	228
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/26/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: ____

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ ____ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ ____ N ■
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐

NUMBER OF CONTAINERS: 8 FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/27/04

WEATHER CONDITIONS: cold / overcast

COMMENTS: ____

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-15
PROJECT NO.: 01305.40
WELL NO.: E-15
SAMPLE DATE: 1/26/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 17:45 / 18:15
SAMPLE SEQUENCE NO.: 6
SAMPLE COLLECTION EQUIPMENT: Peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 14.58 / 16.13
RECHARGE TIME: 7 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.52
Specific Conductance	~~umho/cm~~ mS/m	74
Water Temperature	°C	13.5
Dissolved Oxygen	ppm	3.8
Redox	mV	23
Turbidity	NTU	10.1

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/26/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐	N ■
APIX Diss. METALS	250 mL	1	Y ☒	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: .45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE:
WEATHER CONDITIONS: cold
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

OJECT Hercules/Jefferson
SAMPLE ID E-59
PROJECT NO. 01305.40
WELL NO. E-59
SAMPLE DATE 1/27/04
SAMPLED BY MAL
SAMPLE TIME (START/END) 9:20 / 9:35
SAMPLE SEQUENCE NO. 7
SAMPLE COLLECTION EQUIPMENT Grundfos subpump + dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 8.86 / 9.01
RECHARGE TIME 5 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.22
Specific Conductance	~~umho/cm~~ S/m	91
Water Temperature	°C	16.0
Dissolved Oxygen	ppm	3.3
Redox	mV	-40
Turbidity	NTU	out of range

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/27/04

ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Very cloudy, turbid

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX Diss. METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD .45 micron filter
ABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/27/04
VEATHER CONDITIONS cold, icy
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-31 / DUP-1
PROJECT NO.	01305.40	WELL NO.	E-31
SAMPLE DATE	1/27/04	SAMPLED BY	CGK
SAMPLE TIME (START/END)	0920 / 0950	SAMPLE SEQUENCE NO.	8

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 7.85 / 7.91

RECHARGE TIME: 5 min

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	12.45
Specific Conductance	umho/cm	0.134
Water Temperature	°C	10.64
Dissolved Oxygen	ppm	0.00
Redox	mV	-307
Turbidity	NTU	120

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/27/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear; strong sulfur odor

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	8	Y ☐	N ■	Y ■ HCL	N ☐
APIX SVOC	1 L	4	Y ☐	N ■	Y ☐	N ■
APIX METALS	250 mL	2	Y ■	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	2	Y ☐	N ■	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 16 FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/27/04

WEATHER CONDITIONS: cold/overcast

COMMENTS: Dup-01 collected

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-60
PROJECT NO.: 01305.40
WELL NO.: E-60
SAMPLE DATE: 1/27/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 11:15 / 11:30
SAMPLE SEQUENCE NO.: 9
SAMPLE COLLECTION EQUIPMENT: Grundfos sub pump + dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 13.97 / 13.99
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.32
Specific Conductance	~~umho/cm~~ S/m	83
Water Temperature	°C	16.1
Dissolved Oxygen	ppm	2.7
Redox	mV	-115
Turbidity	NTU	OUT OF RANGE

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/27/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Very cloudy, Turbid

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ☐	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ☐	Y ☐ N ■
APIX Diss. METALS	250 mL	1	Y ☐ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ☐	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/27/04
WEATHER CONDITIONS: cold, icy, Steady Rain
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-33
PROJECT NO.: 01305.40
WELL NO.: E-33
SAMPLE DATE: 1/27/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1155 / 1210
SAMPLE SEQUENCE NO.: 10
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 7.56 / 7.56
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	8.65
Specific Conductance	umho/cm	1.04
Water Temperature	°C	12.57
Dissolved Oxygen	ppm	3.83
Redox	mV	-50
Turbidity	NTU	410

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/27/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: cloudy
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/27/04
WEATHER CONDITIONS: cold / rain
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

ROJECT Hercules/Jefferson
SAMPLE ID E-13-D
PROJECT NO. 01305.40
WELL NO. E-13-D
SAMPLE DATE 1/27/04
SAMPLED BY MAL
SAMPLE TIME (START/END) 13:35 / 14:00
SAMPLE SEQUENCE NO. 11
SAMPLE COLLECTION EQUIPMENT Grundfos sub pump with dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 22.03 / 22.19
RECHARGE TIME 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.44
Specific Conductance	~~umho/cm~~ S/m	86
Water Temperature	°C	15.8
Dissolved Oxygen	ppm	5.4
Redox	mV	-62
Turbidity	NTU	OUT OF RANGE

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/27/04
'ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: VERY CLOUDY, EXTREMELY TURBID
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX Diss. METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD .45 micron filter
'LABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/27/04
WEATHER CONDITIONS cold, rain
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-49
PROJECT NO.: 01305.40
WELL NO.: E-49
SAMPLE DATE: 1/27/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 17:05 / 17:40
SAMPLE SEQUENCE NO.: 12
SAMPLE COLLECTION EQUIPMENT: Peristaltic Pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 5.85 / 14:54
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	7.91
Specific Conductance	~~umho/cm~~ mS/cm	76
Water Temperature	°C	7.8
Dissolved Oxygen	ppm	12.7
Redox	mV	141
Turbidity	NTU	OUT OF RANGE

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/27/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Very cloudy, muddy, Turbid
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 45 micron Filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/27/04
WEATHER CONDITIONS: cold, rainy
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

.OJECT Hercules/Jefferson
SAMPLE ID E-23
PROJECT NO. 01305.40
WELL NO. E-23
SAMPLE DATE 1/27/04
SAMPLED BY CGK
SAMPLE TIME (START/END) 1640 / 1655
SAMPLE SEQUENCE NO. 13
SAMPLE COLLECTION EQUIPMENT peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 25.31 / 25.42
RECHARGE TIME 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	4.27
Specific Conductance	umho/cm	70.0
Water Temperature	°C	7.71
Dissolved Oxygen	ppm	0.00
Redox	mV	239
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/27/04

ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐	N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD 40 micron filter
ABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/28/04
WEATHER CONDITIONS cold / snow showers
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-61 / MS / MSD
PROJECT NO.	01305.40	WELL NO.	E-61
SAMPLE DATE	1/28/04	SAMPLED BY	MAL
SAMPLE TIME (START/END)	10:55 / 11:20	SAMPLE SEQUENCE NO.	14

SAMPLE COLLECTION EQUIPMENT: Grundfos sub pump & dedicated tubing

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 16.10 / 18.18

RECHARGE TIME: 15 min

MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.38
Specific Conductance	~~umho/cm~~ mS/m	90
Water Temperature	°C	14.8
Dissolved Oxygen	ppm	6.6
Redox	mV	-173
Turbidity	NTU	Out of Range

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/28/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Extremely Turbid, Muddy

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	~~4~~ 12	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	~~2~~ 6	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: ~~8~~ 20 FILTRATION METHOD: 45 micronfilter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/28/04

WEATHER CONDITIONS: very cold, windy

COMMENTS: An MS/MSD was collected on this sample.

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-35
PROJECT NO.	01305.40	WELL NO.	E-35
SAMPLE DATE	1/28/04	SAMPLED BY	CGK
SAMPLE TIME (START/END)	1030 / 1055	SAMPLE SEQUENCE NO.	15

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 10.49 / 10.51

RECHARGE TIME: 5 min

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	8.40
Specific Conductance	umho/cm	0.093
Water Temperature	°C	8.49
Dissolved Oxygen	ppm	0.00
Redox	mV	-10
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/28/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ ___ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ ___ N ■
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐

NUMBER OF CONTAINERS: 8 FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/28/04

WEATHER CONDITIONS: cold / snow flurries

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson
SAMPLE ID E-37
PROJECT NO. 01305.40
WELL NO. E-37
SAMPLE DATE 1/28/04
SAMPLED BY CGK
SAMPLE TIME (START/END) 1340 / 1355
SAMPLE SEQUENCE NO. 16
SAMPLE COLLECTION EQUIPMENT peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 14.16 / 14.18
RECHARGE TIME 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	5.24
Specific Conductance	umho/cm	89.5
Water Temperature	°C	12.27
Dissolved Oxygen	ppm	0.00
Redox	mV	262
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/28/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ ___ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ ___ N ■
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD 0.45 micron filter
LABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/28/04
WEATHER CONDITIONS cold / snow flurry
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-62
PROJECT NO.	01305.40	WELL NO.	E-62
SAMPLE DATE	1/29/04	SAMPLED BY	MAL
SAMPLE TIME (START/END)	10:20 / 10:40	SAMPLE SEQUENCE NO.	17

SAMPLE COLLECTION EQUIPMENT: submersible whale pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 24.46 / 26.45

RECHARGE TIME: 5 min

MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	10.41
Specific Conductance	~~umho/cm~~ S/m	86.2
Water Temperature	°C	13.42
Dissolved Oxygen	ppm	0.00
Redox	mV	-189
Turbidity	NTU	OUT OF RANGE

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/29/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: VERY CLOUDY, EXTREMELY TURBID

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8 FILTRATION METHOD: 45 micron filter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/29/04

WEATHER CONDITIONS: Cold / CLEAR

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-3AD
PROJECT NO.: 01305.40
WELL NO.: E-3AD
SAMPLE DATE: 1/29/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 13:10 / 13:25
SAMPLE SEQUENCE NO.: 18
SAMPLE COLLECTION EQUIPMENT: submersible whale pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 5.70 / 6.58
RECHARGE TIME: 15 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	9.98
Specific Conductance	~~umho/cm~~ S/m	0.115
Water Temperature	°C	13.01
Dissolved Oxygen	ppm	0.00
Redox	mV	-142
Turbidity	NTU	40

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/29/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: slightly cloudy
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: .45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/29/04
WEATHER CONDITIONS: cold
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson
SAMPLE ID E-57
PROJECT NO. 01305.40
WELL NO. E-57
SAMPLE DATE 1/29/04
SAMPLED BY CGK
SAMPLE TIME (START/END) 1210 / 1225
SAMPLE SEQUENCE NO. 19
SAMPLE COLLECTION EQUIPMENT peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 10.61 / 10.62
RECHARGE TIME 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.80
Specific Conductance	umho/cm	96
Water Temperature	°C	12.1
Dissolved Oxygen	ppm	4.1
Redox	mV	113
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/29/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐	N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD 0.45 micron filter
LABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/29/04
WEATHER CONDITIONS cold / clear
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-140
PROJECT NO.: 01305.40
WELL NO.: E-14
SAMPLE DATE: 1/29/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1510 / 1525
SAMPLE SEQUENCE NO.: 20
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 17.08 / 19.12
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	5.09
Specific Conductance	umho/cm	61
Water Temperature	°C	10.6
Dissolved Oxygen	ppm	5.7
Redox	mV	287
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/29/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■	HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐		N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■	HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐		N ■
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/29/04
WEATHER CONDITIONS: cold / clear
COMMENTS: [illegible]

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-54
PROJECT NO.	01305.40	WELL NO.	E-54
SAMPLE DATE	1/30/04	SAMPLED BY	CGK
SAMPLE TIME (START/END)	0920 / 0935	SAMPLE SEQUENCE NO.	21

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 17.84 / 17.86

RECHARGE TIME: 5 min.

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	6.27
Specific Conductance	umho/cm	64
Water Temperature	°C	10.0
Dissolved Oxygen	ppm	4.3
Redox	mV	186
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/30/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐	N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8 FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/30/04

WEATHER CONDITIONS: cold / overcast

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-24
PROJECT NO.: 01305.40
WELL NO.: E-24
SAMPLE DATE: 1/30/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1055 / 1110
SAMPLE SEQUENCE NO.: 22
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 17.20 / 17.23
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	5.41
Specific Conductance	umho/cm	96
Water Temperature	°C	12.8
Dissolved Oxygen	ppm	3.4
Redox	mV	285
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/30/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ ____ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ ____ N ■
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐
			Y ☐ N ☐	Y ☐ ____ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/30/04
WEATHER CONDITIONS: cold / overcast
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

ROJECT	Hercules/Jefferson	SAMPLE ID	E-17D
PROJECT NO.	01305.40	WELL NO.	E-17D
SAMPLE DATE	1/30/04	SAMPLED BY	MAL
SAMPLE TIME (START/END)	13:05 / 13:20	SAMPLE SEQUENCE NO.	23

SAMPLE COLLECTION EQUIPMENT submersible whale pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 20.37 / 20.74

RECHARGE TIME 5 min

MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	7.02
Specific Conductance	~~umho/cm~~ mS/m	0.098
Water Temperature	°C	14.85
Dissolved Oxygen	ppm	0.00
Redox	mV	59
Turbidity	NTU	76

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/30/04

ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Slightly cloudy

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8 FILTRATION METHOD .45 micron filter

BORATORY STL-Savannah DELIVERED VIA FedEx DATE 1/30/04

WEATHER CONDITIONS cold

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-46D
PROJECT NO.: 01305.40
WELL NO.: E-46D
SAMPLE DATE: 1/29/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 16:55 / 17:15
SAMPLE SEQUENCE NO.: 24
SAMPLE COLLECTION EQUIPMENT: submersible whale pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 20.90 / 20.30
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	9.04
Specific Conductance	~~umho/cm~~ mS/m	0.377
Water Temperature	°C	13.83
Dissolved Oxygen	ppm	0.00
Redox	mV	-70
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/29/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/30/04
WEATHER CONDITIONS: cold / Partly Cloudy
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	W-15
PROJECT NO.	01305.40	WELL NO.	PW-15
SAMPLE DATE	1/29/04	SAMPLED BY	CGK
SAMPLE TIME (START/END)	1820 / 1835	SAMPLE SEQUENCE NO.	25

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 5.50 / 5.51

RECHARGE TIME: 5 min.

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	6.82
Specific Conductance	umho/cm	0.27
Water Temperature	°C	6.1
Dissolved Oxygen	ppm	5.1
Redox	mV	-51
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/29/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■	HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐		N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■	HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐		N ■
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 8 FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah DELIVERED VIA: FedEx DATE: 1/30/04

WEATHER CONDITIONS: cold/clear

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson
SAMPLE ID E-8D
PROJECT NO. 01305.40
WELL NO. E-8D
SAMPLE DATE 1/30/04
SAMPLED BY MAL
SAMPLE TIME (START/END) 15:10 /
SAMPLE SEQUENCE NO. 26
SAMPLE COLLECTION EQUIPMENT submersible whale pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 16.48 / 16.71
RECHARGE TIME 5 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	9.56
Specific Conductance	~~umho/cm~~ S/m	0.116
Water Temperature	°C	12.87
Dissolved Oxygen	ppm	0.00
Redox	mV	-140
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/30/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: CLEAN

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX Diss. METALS	250 mL	1	Y ☑	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8
FILTRATION METHOD 45 micron filter
LABORATORY STL-Savannah
DELIVERED VIA FedEx
DATE 1/30/04
WEATHER CONDITIONS cold
COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

.OJECT Hercules/Jefferson

SAMPLE ID MW-F3

PROJECT NO. 01305.40

WELL NO. MW-F3

SAMPLE DATE 1/30/04

SAMPLED BY CGK

SAMPLE TIME (START/END) 1245 / 1300

SAMPLE SEQUENCE NO. 27

SAMPLE COLLECTION EQUIPMENT peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 10.20 / 10.22

RECHARGE TIME 5 min.

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	5.32
Specific Conductance	umho/cm	0.16
Water Temperature	°C	9.7
Dissolved Oxygen	ppm	0.0
Redox	mV	280
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/30/04

ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■	HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐		N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■	HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐		N ■
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS 8

FILTRATION METHOD 0.45 micron filter

ABORATORY STL-Savannah

DELIVERED VIA FedEx

DATE 1/30/04

WEATHER CONDITIONS cold / overcast

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-55
PROJECT NO.: 01305.40
WELL NO.: E-55
SAMPLE DATE: 1/30/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1445 /
SAMPLE SEQUENCE NO.: 28
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 11.22 / 12.78
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.67
Specific Conductance	umho/cm	0.13
Water Temperature	°C	11.8
Dissolved Oxygen	ppm	0.0
Redox	mV	-170
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 1/30/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX VOC	40 mL	4	Y ☐	N ■	Y ■	HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ■	Y ☐		N ■
APIX METALS	250 mL	1	Y ■	N ☐	Y ■	HNO3	N ☐
TDS	500 mL	1	Y ☐	N ■	Y ☐		N ■
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/30/04
WEATHER CONDITIONS: cold / overcast
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-45D
PROJECT NO.: 01305.40
WELL NO.: E-45D
SAMPLE DATE: 1/30/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 16:25 / 16:40
SAMPLE SEQUENCE NO.: 29
SAMPLE COLLECTION EQUIPMENT: submersible whale pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 6.15 / 36.10
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	9.34
Specific Conductance	~~umho/cm~~ mS/m	1.21
Water Temperature	°C	12.75
Dissolved Oxygen	ppm	0.00
Redox	mV	-97
Turbidity	NTU	450

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 1/30/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Very cloudy, Turbid

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 1/30/04
WEATHER CONDITIONS: cold
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson — SAMPLE ID: E-51

PROJECT NO.: 01305.40 — WELL NO.: E-51

SAMPLE DATE: 1/30/04 — SAMPLED BY: CGK

SAMPLE TIME (START/END): 1600 / 1610 — SAMPLE SEQUENCE NO.: 30

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 13.35 / 13.89

RECHARGE TIME: 5 min. — MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	5.61
Specific Conductance	umho/cm	0.09
Water Temperature	°C	12.6
Dissolved Oxygen	ppm	0
Redox	mV	220
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ — DATE 1/30/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8 — FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah — DELIVERED VIA: FedEx — DATE: 1/30/04

WEATHER CONDITIONS: cold / overcast

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-29
PROJECT NO.: 01305.40
WELL NO.: E-29
SAMPLE DATE: 2/2/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 13:55 / 14:30
SAMPLE SEQUENCE NO.: 31
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 17.90 / 18.66
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.31
Specific Conductance	umho/cm	0.117
Water Temperature	°C	13.03
Dissolved Oxygen	ppm	0.00
Redox	mV	193
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/2/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clean
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX (diss) METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/2/04
WEATHER CONDITIONS: 30's, partly cloudy
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson

SAMPLE ID E-48

PROJECT NO. 01305.40

WELL NO. E-48

SAMPLE DATE 2/2/04

SAMPLED BY MAL

SAMPLE TIME (START/END) 15:25 / 16:00

SAMPLE SEQUENCE NO. 32

SAMPLE COLLECTION EQUIPMENT peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 17.53 / 18.32

RECHARGE TIME 5 min

MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	4.53
Specific Conductance	~~umho/cm~~ S/m	0.319
Water Temperature	°C	14.25
Dissolved Oxygen	ppm	0.00
Redox	mV	286
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 2/2/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8

FILTRATION METHOD 45 micron filter

LABORATORY STL-Savannah

DELIVERED VIA FedEx

DATE 2/2/04

WEATHER CONDITIONS 30's, partly cloudy

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

:OJECT Hercules/Jefferson SAMPLE ID E-40

PROJECT NO. 01305.40 WELL NO. E-40

SAMPLE DATE 2/2/04 SAMPLED BY CGK

SAMPLE TIME (START/END) 1310 / 1325 SAMPLE SEQUENCE NO. 33

SAMPLE COLLECTION EQUIPMENT peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 17.24 / 17.27

RECHARGE TIME 5 min. MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	3.29
Specific Conductance	umho/cm	0.15
Water Temperature	°C	13.5
Dissolved Oxygen	ppm	8.4
Redox	mV	-95
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/2/04

ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS 8 FILTRATION METHOD 0.45 micron filter

ABORATORY STL-Savannah DELIVERED VIA FedEx DATE 2/3/04

WEATHER CONDITIONS cool/overcast

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules/Jefferson

SAMPLE ID E-34

PROJECT NO. 01305.40

WELL NO. E-34

SAMPLE DATE 2/2/04

SAMPLED BY CGK

SAMPLE TIME (START/END) 1505 / 1520

SAMPLE SEQUENCE NO. 34

SAMPLE COLLECTION EQUIPMENT peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 3.50 / 3.53

RECHARGE TIME 5 min.

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	2.74
Specific Conductance	umho/cm	1.9
Water Temperature	°C	12.2
Dissolved Oxygen	ppm	10.7
Redox	mV	84
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/2/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☒	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐	N ■
APIX METALS	250 mL	1	Y ☒	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8

FILTRATION METHOD 0.45 micron filter

LABORATORY STL-Savannah

DELIVERED VIA FedEx

DATE 2/3/04

WEATHER CONDITIONS cool / overcast

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

ROJECT: Hercules/Jefferson
SAMPLE ID: W-2A / DUP-2
PROJECT NO.: 01305.40
WELL NO.: W-2A
SAMPLE DATE: 2/3/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 15:10 / 15:50
SAMPLE SEQUENCE NO.: 35
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 17.26 / 17.54
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	9.70
Specific Conductance	~~umho/cm~~ S/m	0.141
Water Temperature	°C	13.51
Dissolved Oxygen	ppm	0.00
Redox	mV	-93
Turbidity	NTU	/

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 2/3/04
'ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clean
SAMPLING FLOW RATE: 100ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☑	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☑	Y ☐	N ■
APIX METALS	250 mL	1	Y ☑	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☑	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 16
FILTRATION METHOD: 45 micron filter
'ABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/3/04
WEATHER CONDITIONS: rainy / cold
COMMENTS: Duplicate "2" was collected on this sample.

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-53
PROJECT NO.: 01305.40
WELL NO.: E-53
SAMPLE DATE: 2/3/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1435 / 1450
SAMPLE SEQUENCE NO.: 36
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 13.78 / 13.83
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	5.03
Specific Conductance	umho/cm	0.38
Water Temperature	°C	12.01
Dissolved Oxygen	ppm	7.4
Redox	mV	85
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/3/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ■	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ■	Y ☐	N ■
APIX METALS	250 mL	1	Y ■	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ■	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/3/04
WEATHER CONDITIONS: cool / rain
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-56
PROJECT NO.: 01305.40
WELL NO.: E-56
SAMPLE DATE: 2/3/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1605 / 1615
SAMPLE SEQUENCE NO.: 37
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 10.07 / 10.14
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	4.50
Specific Conductance	umho/cm	0.63
Water Temperature	°C	11.94
Dissolved Oxygen	ppm	5.5
Redox	mV	-87
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/3/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS:

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ■	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ■	Y ☐ N ■
APIX METALS	250 mL	1	Y ■ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ■	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/3/04
WEATHER CONDITIONS: cool/rain
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: MW-F2
PROJECT NO.: 01305.40
WELL NO.: MW-F2
SAMPLE DATE: 2/4/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 0925 / 0940
SAMPLE SEQUENCE NO.: 38
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 8.74 / 8.76
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	4.92
Specific Conductance	umho/cm	0.53
Water Temperature	°C	10.48
Dissolved Oxygen	ppm	5.2
Redox	mV	-161
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/4/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ☒	Y ■ HCL N ☐
APIX SVOC	1 L	2	Y ☐ N ☒	Y ☐ N ■
APIX METALS	250 mL	1	Y ☒ N ☐	Y ■ HNO3 N ☐
TDS	500 mL	1	Y ☐ N ☒	Y ☐ N ■
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/4/04
WEATHER CONDITIONS: cold/overcast
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

ROJECT: Hercules/Jefferson
SAMPLE ID: E-47D /ms/msd
PROJECT NO.: 01305.40
WELL NO.: E-47D
SAMPLE DATE: 2/4/04
SAMPLED BY: MAL
SAMPLE TIME (START/END): 9:55 / 10:10
SAMPLE SEQUENCE NO.: 39
SAMPLE COLLECTION EQUIPMENT: submersible whale pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 18.30 / 18.45
RECHARGE TIME: 10 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	9.54
Specific Conductance	~~umho/cm~~ S/m	0.150
Water Temperature	°C	13.77
Dissolved Oxygen	ppm	0.00
Redox	mV	-110
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/4/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	~~4~~ 12	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	~~2~~ 6	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 20
FILTRATION METHOD: 45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/4/04
WEATHER CONDITIONS: cold
COMMENTS: An ms/msd was collected on this sample

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: E-27
PROJECT NO.: 01305.40
WELL NO.: E-27
SAMPLE DATE: 2/4/04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1105 / 1115
SAMPLE SEQUENCE NO.: 40
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 14.51 / 14.57
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	5.23
Specific Conductance	umho/cm	0.32
Water Temperature	°C	14.40
Dissolved Oxygen	ppm	4.6
Redox	mV	-88
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 2/4/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ■	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ■	Y ☐	N ■
APIX METALS	250 mL	1	Y ■	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ■	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 2/4/04
WEATHER CONDITIONS: cold / overcast
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

ROJECT	Hercules/Jefferson	SAMPLE ID	MW-F1
PROJECT NO.	01305.40	WELL NO.	MW-F1
SAMPLE DATE	2/4/04	SAMPLED BY	MAL
SAMPLE TIME (START/END)	12:40 / 13:05	SAMPLE SEQUENCE NO.	41

SAMPLE COLLECTION EQUIPMENT peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 7.99 / 8.62

RECHARGE TIME 5 min MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	6.1
Specific Conductance	~~umho/cm~~ S/m	0.18
Water Temperature	°C	13.9
Dissolved Oxygen	ppm	1.18
Redox	mV	277
Turbidity	NTU	33

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 2/4/04

'ATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear

SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 8 FILTRATION METHOD .45 micron filter

ABORATORY STL-Savannah DELIVERED VIA FedEx DATE 2/4/04

WEATHER CONDITIONS cold / Partly cloudy

COMMENTS

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	MW-5/MS/MSD/Dup-03
PROJECT NO.	01305.40	WELL NO.	MW-5
SAMPLE DATE	2/4/04	SAMPLED BY	CGK
SAMPLE TIME (START/END)	1440 / 1530	SAMPLE SEQUENCE NO.	42

SAMPLE COLLECTION EQUIPMENT: peristaltic pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 8.47 / 8.47

RECHARGE TIME: 5 min   MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.05
Specific Conductance	umho/cm	0.18
Water Temperature	°C	10.48
Dissolved Oxygen	ppm	6.4
Redox	mV	-145
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒   DATE 2/4/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	~~4~~ 16	Y ☐	N ■	Y ■ HCL	N ☐
APIX SVOC	1 L	~~2~~ 8	Y ☐	N ■	Y ☐ ____	N ■
APIX METALS	250 mL	~~1~~ 4	Y ■	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	~~4~~ 4	Y ☐	N ■	Y ☐ ____	N ■
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐

NUMBER OF CONTAINERS: 32   FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL-Savannah   DELIVERED VIA: FedEx   DATE: 2/4/04

WEATHER CONDITIONS: cold / overcast

COMMENTS: ______

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT	Hercules/Jefferson	SAMPLE ID	E-28-D
PROJECT NO.	01305.40	WELL NO.	E-28-D
SAMPLE DATE	2/5/04	SAMPLED BY	MAL
SAMPLE TIME (START/END)	9:40 / 9:55	SAMPLE SEQUENCE NO.	43

SAMPLE COLLECTION EQUIPMENT: Submersible Whale Pump

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 17.33 / 17.54

RECHARGE TIME: 5 min — MEASURED FROM ☐ TOC ☑ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.69
Specific Conductance	~~umho/cm~~ S/m	0.14
Water Temperature	°C	14.2
Dissolved Oxygen	ppm	0.38
Redox	mV	-120
Turbidity	NTU	70

METER CALIBRATION PERFORMED? N ☐ Y ☑ DATE 2/5/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Slightly Cloudy

SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☐	Y ■ HCL	N ☐
APIX SVOC	1 L	2	Y ☐	N ☐	Y ☐	N ■
APIX METALS	250 mL	1	Y ☐	N ☐	Y ■ HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☐	Y ☐	N ■
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8 — FILTRATION METHOD: .45 micron Filter

LABORATORY: STL-Savannah — DELIVERED VIA: FedEx — DATE: 2/5/04

WEATHER CONDITIONS: Cold / Partly cloudy

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson
SAMPLE ID: E-21
PROJECT NO.: 01305.4.0
WELL NO.: E-21
SAMPLE DATE: 3 / 1 / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 0925 / 0935
SAMPLE SEQUENCE NO.: 1
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 2.08 / 2.09
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.87
Specific Conductance	umho/cm	1.7
Water Temperature	°C	9.3
Dissolved Oxygen	ppm	0.00
Redox	mV	-42
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear; sulfur odor
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX vols	40 mL	4	Y ☐	N ☒	Y ☒	HCl	N ☐
APIX svocs	1L	2	Y ☐	N ☒	Y ☐		N ☒
APIX metals	250 mL	1	Y ☒	N ☐	Y ☒	HNO3	N ☐
TDS	500 mL	1	Y ☐	N ☒	Y ☐		N ☒
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL - Savannah
DELIVERED VIA: Fed Ex
DATE: 3/2/04
WEATHER CONDITIONS: clear - 45°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules-Jefferson Plant
SAMPLE ID: E-28D
PROJECT NO.: 01305.40
WELL NO.: E-28D
SAMPLE DATE: 3/1/04
SAMPLED BY: CLN
SAMPLE TIME (START/END): 09:47 / 10:02
SAMPLE SEQUENCE NO.: 2
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 23.20 / 23.24
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.86
Specific Conductance	~~umho/cm~~ S/m	0.16
Water Temperature	°C	14.5
Dissolved Oxygen	ppm	0.35
Redox	mV	-132
Turbidity	NTU	70

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: ~ 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
App IX VOCs	40ml	4	Y ☐	N ☒	Y ☒ HCl	N ☐
App IX SVOCs	1L	2	Y ☐	N ☒	Y ☐	N ☒
App IX Inorganics	500ml	1	Y ☒	N ☐	Y ☒ HNO3	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45µ Filter
LABORATORY: STL-Savannah, GA
DELIVERED VIA: Fedex
DATE: 3/2/04
WEATHER CONDITIONS: Sunny, 40°'s
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules/Jefferson
SAMPLE ID: W-1A
PROJECT NO.: 01305.40
WELL NO.: W-1A
SAMPLE DATE: 3 / 1 / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1020 / 1030
SAMPLE SEQUENCE NO.: 3
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 7.63 / 7.70
RECHARGE TIME: 5 min
MEASURED FROM ☒ TOC ☐ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.10
Specific Conductance	umho/cm	67
Water Temperature	°C	10.4
Dissolved Oxygen	ppm	0.00
Redox	mV	18
Turbidity	NTU	10

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40mL	4	Y ☐	N ☒	Y ☒ HCl	N ☐
APIX SVOC	1L	2	Y ☐	N ☒	Y ☐	N ☒
APIX metals	250mL	1	Y ☒	N ☐	Y ☒ HNO_3	N ☐
TDS	300mL	1	Y ☐	N ☒	Y ☐	N ☒
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: Fed Ex
DATE: 3/2/04
WEATHER CONDITIONS: clear - 50°F
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules-Jefferson
SAMPLE ID: E-59
PROJECT NO.: 01305
WELL NO.: E-59
SAMPLE DATE: 3/1/04
SAMPLED BY: CLN
SAMPLE TIME (START/END): 11:40 / 12:00
SAMPLE SEQUENCE NO.: 4
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 10.70/ 10.75
RECHARGE TIME: 5 minutes
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.91
Specific Conductance	~~umho/cm~~ S/m	0.11
Water Temperature	°C	15.3
Dissolved Oxygen	ppm	0.30
Redox	mV	-31
Turbidity	NTU	340

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Cloudy, brown
SAMPLING FLOW RATE: ~200

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
App IX VOCs	40ml	4	Y ☐	N ☒	Y ☒	HCl	N ☐
App IX SVOCs	1L	2	Y ☐	N ☒	Y ☐		N ☒
App IX Inorganics	500ml	1	Y ☒	N ☐	Y ☒	HNO3	N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45 µ Filter
LABORATORY: STL-Savannah, GA
DELIVERED VIA: Fedex
DATE: 3/2/04
WEATHER CONDITIONS: Sunny, 50's
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson
SAMPLE ID: W-7
PROJECT NO.: 01305.40
WELL NO.: W-7
SAMPLE DATE: 3 / 1 / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1125 / 1140
SAMPLE SEQUENCE NO.: 5
SAMPLE COLLECTION EQUIPMENT: peristaltic pump
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 13.19 / 13.29
RECHARGE TIME: 5 min.
MEASURED FROM ☒ TOC ☐ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.12
Specific Conductance	umho/cm	0.16
Water Temperature	°C	10.4
Dissolved Oxygen	ppm	0.00
Redox	mV	-142
Turbidity	NTU	15

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: gray; sulfur odor
SAMPLING FLOW RATE: 100mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40mL	4	Y ☐ N ☒	Y ☒ HCl N ☐
APIX metals	250mL	1	Y ☒ N ☐	Y ☒ HNO3 N ☐
APIX SVOC	1L	2	Y ☐ N ☒	Y ☐ N ☒
TDS	500mL	1	Y ☐ N ☒	Y ☐ N ☒
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 8
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: Fed Ex
DATE: 3/2/04
WEATHER CONDITIONS: misty cloudy ~ 56°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson
SAMPLE ID: E-47D
PROJECT NO.: 01305.40
WELL NO.: E-47D
SAMPLE DATE: 3 / 1 / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1310 / 1325
SAMPLE SEQUENCE NO.: 6
SAMPLE COLLECTION EQUIPMENT: whale pump / dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 20.55 / 20.70
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.05
Specific Conductance	umho/cm	0.14
Water Temperature	°C	15.2
Dissolved Oxygen	ppm	0.00
Redox	mV	-86
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOCs	40 mL	4	Y ☐	N ☒	Y ☒ HCl	N ☐
APIX SVOCs	1 L	2	Y ☐	N ☒	Y ☐	N ☒
APIX Metals	250 mL	1	Y ☒	N ☐	Y ☒ HNO3	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL- Savannah
DELIVERED VIA: Fed Ex
DATE: 3/2/04
WEATHER CONDITIONS: clear - 60°F
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules - Jefferson
SAMPLE ID: E-46D
PROJECT NO.: 01305.40
WELL NO.: E-46D
SAMPLE DATE: 3 / 1 / 04
SAMPLED BY: CLN
SAMPLE TIME (START/END): 13:40 / 14:00
SAMPLE SEQUENCE NO.: 7
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 23.03 / 23.09
RECHARGE TIME: 5 minutes
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.10
Specific Conductance	~~umho/cm~~ S/m	0.28
Water Temperature	°C	14.6
Dissolved Oxygen	ppm	0.89
Redox	mV	-69
Turbidity	NTU	20

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: ~ 200ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
App IX VOCs	40ml	4	Y ☐	N ☒	Y ☒ HCl	N ☐
App IX SVOCs	1L	2	Y ☐	N ☒	Y ☐	N ☒
App IX Inorganics	500ml	1	Y ☒	N ☐	Y ☒ HNO3	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45μ Filter
LABORATORY: STL - Savannah
DELIVERED VIA: Fedex
DATE: 3/2/04
WEATHER CONDITIONS: Sunny, 50's
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson
SAMPLE ID: E-17D
PROJECT NO.: 01305.40
WELL NO.: E-17D
SAMPLE DATE: 3 / 1 / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1505 / 1520
SAMPLE SEQUENCE NO.: 8
SAMPLE COLLECTION EQUIPMENT: whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 20.18 / 20.25
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	5.75
Specific Conductance	umho/cm	91
Water Temperature	°C	16.7
Dissolved Oxygen	ppm	6.39
Redox	mV	48
Turbidity	NTU	40

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40mL	4	Y ☐	N ☒	Y ☒ HCl	N ☐
APIX SVOC	1L	2	Y ☐	N ☒	Y ☐	N ☒
APIX metals	250mL	1	Y ☒	N ☐	Y ☒ HNO_3	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: FedEx
DATE: 3/2/04
WEATHER CONDITIONS: Clear 60°F
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules-Jefferson Plant SAMPLE ID: E-60
PROJECT NO.: 01305.40 WELL NO.: E-60
SAMPLE DATE: 3/1/04 SAMPLED BY: CLN
SAMPLE TIME (START/END): 15:12 / 15:32 SAMPLE SEQUENCE NO.: 9
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 15.76 / 15.80
RECHARGE TIME: 5 minutes MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.93
Specific Conductance	~~umho/cm~~ S/m	0.12
Water Temperature	°C	16.3
Dissolved Oxygen	ppm	0.27
Redox	mV	-131
Turbidity	NTU	940

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3-1-04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Cloudy, brown
SAMPLING FLOW RATE: ~ 200 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
App IX VOCs	40ml	4	Y ☐	N ☒	Y ☒	HCl	N ☐
App IX SVOCs	1L	2	Y ☐	N ☒	Y ☐		N ☒
App IX Inorganics	500ml	1	Y ☒	N ☐	Y ☒	HNO3	N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 7 FILTRATION METHOD: 0.45µ Filter
LABORATORY: STL-Savannah, GA DELIVERED VIA: Fedex DATE: 3/2/04
WEATHER CONDITIONS: Sunny, 60°'s
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson
SAMPLE ID: E-13D
PROJECT NO.: 01305.40
WELL NO.: E-13D
SAMPLE DATE: 3 / 1? / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1635 / 1650
SAMPLE SEQUENCE NO.: 10
SAMPLE COLLECTION EQUIPMENT: whale pump - dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 21.69 / 21.74
RECHARGE TIME: 5 min
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.98
Specific Conductance	umho/cm	0.11
Water Temperature	°C	15.5
Dissolved Oxygen	ppm	0.00
Redox	mV	-102
Turbidity	NTU	above detection limit

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1?/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
APIX VOC	40 mL	4	Y ☐ N ☒	Y ☒ HCl N ☐
APIX SVOC	1 L	2	Y ☐ N ☒	Y ☐ N ☒
APIX metals	250 mL	1	Y ☒ N ☐	Y ☒ HNO3 N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐
			Y ☐ N ☐	Y ☐ N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL-Savannah
DELIVERED VIA: Fed Ex
DATE: 3/2/04
WEATHER CONDITIONS: overcast - 56°F
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules - Jefferson
SAMPLE ID: E-45D
PROJECT NO.: 01305.40
WELL NO.: E-45D
SAMPLE DATE: 3/1/04
SAMPLED BY: CLN
SAMPLE TIME (START/END): 16:35 / 16:50
SAMPLE SEQUENCE NO.: 11
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 12.80 / 14.94
RECHARGE TIME: 5 minutes
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.50
Specific Conductance	~~umho/cm~~ S/m	1.6
Water Temperature	°C	14.3
Dissolved Oxygen	ppm	0.26
Redox	mV	-126
Turbidity	NTU	380

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/1/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Cloudy, gray
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
App IX VOCs	40ml	4	Y ☐	N ☒	Y ☒ HCl	N ☐
App IX SVOCs	1L	2	Y ☐	N ☒	Y ☐ ____	N ☒
App IX Inorganics	500ml	1	Y ☒	N ☐	Y ☒ HNO3	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐
			Y ☐	N ☐	Y ☐ ____	N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45 μ Filter
LABORATORY: STL-Savannah
DELIVERED VIA: Fedex
DATE: 3/2/04
WEATHER CONDITIONS: Cloudy, breezy, 50°s
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules - Jefferson
SAMPLE ID: E-62
PROJECT NO.: 01305.40
WELL NO.: E-62
SAMPLE DATE: 3/2/04
SAMPLED BY: CLN
SAMPLE TIME (START/END): 09:48 /
SAMPLE SEQUENCE NO.: 12
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 21.30'
RECHARGE TIME: 5 minutes
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.34
Specific Conductance	~~umho/cm~~ mS/m	63
Water Temperature	°C	15.0
Dissolved Oxygen	ppm	0.35
Redox	mV	-206
Turbidity	NTU	220

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/2/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 ml/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?	PRESERVED?
App IX VOCs	40ml	4	Y ☐ N ☒	Y ☒ HCl N ☐
App IX SVOCs	1L	2	Y ☐ N ☒	Y ☐ ___ N ☒
App IX Inorganics	500ml	1	Y ☒ N ☐	Y ☒ HNO3 N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐
			Y ☐ N ☐	Y ☐ ___ N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45µ Filter
LABORATORY: STL-Savannah
DELIVERED VIA: Fedex
DATE: 3/3/04
WEATHER CONDITIONS: Cloudy, windy, 50's
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson

SAMPLE ID: E-3AD / Dup-1

PROJECT NO.: 01305.40

WELL NO.: E-3AD

SAMPLE DATE: 3 / 2 / 04

SAMPLED BY: CGK

SAMPLE TIME (START/END): 0955 / 1010

SAMPLE SEQUENCE NO.: 13

SAMPLE COLLECTION EQUIPMENT: whale pump w/ dedicated tubing

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 5.25 /

RECHARGE TIME: 5 min

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.27
Specific Conductance	umho/cm	87
Water Temperature	°C	14.4
Dissolved Oxygen	ppm	0.00
Redox	mV	-164
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/2/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: clear

SAMPLING FLOW RATE: 150 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
APIX VOC	40 mL	8	Y ☐	N ☒	Y ☒	HCl	N ☐
APIX SVOC	1 L	4	Y ☐	N ☒	Y ☐		N ☒
APIX Metals	250 mL	2	Y ☒	N ☐	Y ☒	HNO3	N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 14

FILTRATION METHOD: 0.45 micron filter

LABORATORY: STL - Savannah

DELIVERED VIA: Fed Ex

DATE: 3/3/04

WEATHER CONDITIONS: mostly cloudy 56°F

COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules / Jefferson
SAMPLE ID: E-8D
PROJECT NO.: 01305.40
WELL NO.: E-8D
SAMPLE DATE: 3 / 2 / 04
SAMPLED BY: CGK
SAMPLE TIME (START/END): 1120 / 1135
SAMPLE SEQUENCE NO.: 14
SAMPLE COLLECTION EQUIPMENT: whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 16.15 /
RECHARGE TIME: 5 min.
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	6.79
Specific Conductance	umho/cm	0.10
Water Temperature	°C	14.3
Dissolved Oxygen	ppm	0.00
Redox	mV	-146
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/2/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE: 100 mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40 mL	4	Y ☐	N ☒	Y ☒ HCl	N ☐
APIX SVOC	1 L	2	Y ☐	N ☒	Y ☐	N ☒
APIX Metals	250 mL	1	Y ☒	N ☐	Y ☒ HNO3	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS: 7
FILTRATION METHOD: 0.45 micron filter
LABORATORY: STL - Savannah
DELIVERED VIA: Fed Ex
DATE: 3/3/04
WEATHER CONDITIONS: mostly cloudy - 60°F
COMMENTS:

f21/corp

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT: Hercules-Jefferson Plant
SAMPLE ID: E-63/MS/MSD
PROJECT NO.: 01305.40
WELL NO.: E-63
SAMPLE DATE: 3/2/04
SAMPLED BY: CLN
SAMPLE TIME (START/END): 11:30 /
SAMPLE SEQUENCE NO.: 15
SAMPLE COLLECTION EQUIPMENT: Whale pump w/ dedicated tubing
DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT): 25.91/ 25.95
RECHARGE TIME: 5 minutes
MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS

pH	Standard Units	7.05
Specific Conductance	~~umho/cm~~ mS/m	71
Water Temperature	°C	13.4
Dissolved Oxygen	ppm	0.37
Redox	mV	-172
Turbidity	NTU	24

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/2/04
WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear
SAMPLING FLOW RATE:

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?		
App IX VOCs	40ml	12	Y ☐	N ☒	Y ☒	HCl	N ☐
App IX SVOCs	1L	6	Y ☐	N ☒	Y ☐		N ☒
App IX Inorganics	500ml	3	Y ☒	N ☐	Y ☒	HNO3	N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐
			Y ☐	N ☐	Y ☐		N ☐

NUMBER OF CONTAINERS: 21
FILTRATION METHOD: 0.45 µ Filter
LABORATORY: STL-Savannah, GA
DELIVERED VIA: Fedex
DATE: 3/3/04
WEATHER CONDITIONS: Sunny, windy, 50's
COMMENTS:

CUMMINGS RITER CONSULTANTS, INC.

WATER SAMPLE COLLECTION REPORT

PROJECT Hercules / Jefferson

SAMPLE ID E-61

PROJECT NO. 01305.4.0

WELL NO. E-61

SAMPLE DATE 3 / 21 / 04

SAMPLED BY CGK

SAMPLE TIME (START/END) 1220 / 1235

SAMPLE SEQUENCE NO. 16

SAMPLE COLLECTION EQUIPMENT whale pump w/ dedicated tubing

DEPTH TO WATER PRIOR TO PURGING/SAMPLING (FT) 15.85 / 15.85

RECHARGE TIME 5 min.

MEASURED FROM ☐ TOC ☒ TOR ☐ GS

FIELD MEASUREMENTS		
pH	Standard Units	7.29
Specific Conductance	umho/cm	0.11
Water Temperature	°C	14.8
Dissolved Oxygen	ppm	0.00
Redox	mV	-173
Turbidity	NTU	0

METER CALIBRATION PERFORMED? N ☐ Y ☒ DATE 3/2/04

WATER APPEARANCE, IMMISCIBLE PHASES OR ODORS: Clear

SAMPLING FLOW RATE: 100mL/min

SAMPLE TYPES COLLECTED

PARAMETER	VOLUME	# CONTAINERS	FIELD FILTERED?		PRESERVED?	
APIX VOC	40mL	4	Y ☐	N ☒	Y ☒ HCl	N ☐
APIX SVOC	1L	2	Y ☐	N ☒	Y ☐	N ☒
APIX Metals	250mL	1	Y ☒	N ☐	Y ☒ HNO3	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐
			Y ☐	N ☐	Y ☐	N ☐

NUMBER OF CONTAINERS 7

FILTRATION METHOD 0.45 micron filter

LABORATORY STL - Savannah

DELIVERED VIA Fed Ex

DATE 3/3/04

WEATHER CONDITIONS mostly cloudy - 60°F

COMMENTS

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
Hercules Jefferson	01305	PA	1	2

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
Betsy Beauchamp		

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Bill Baughman	412-241-4500	

CLIENT NAME: Cummings Riter ~~Hercules Jet~~
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

STANDARD REPORT DELIVERY ⊗ DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	VOC (Appendix 9)	SVOC (Appendix 9)	TDS	Dissolved metals (Appendix 9)	REMARKS
		PRESERVATIVE						HCL	—	—	HNO3	
1/26/04	12:00	E-12	G	✓				4	2	1	1	Additional VOC
1/26/04	12:00	E-58	G	✓				4	2	1	1	analysis for 3#
1/26/04	14:36	E-52	G	✓				4	2	1	1	compounds
1/26/04	14:50	E-63	G	✓				4	2	1	1	1,2,4-Trimethylbenzene
1/26/04	17:01	E-43	G	✓				4	2	1	1	1,3,5-Trimethylbenzene
1/26/04	17:45	E-15	G	✓				4	2	1	1	cis-1,2-Dichloroethene
1/27/04	09:20	E-59	G	✓				4	2	1	1	
1/27/04	09:20	E-31	G	✓				4	2	1	1	
1/27/04	11:15	E-60	G	✓				4	2	1	1	
1/27/04	11:55	E-33	G	✓				4	2	1	1	
1/27/04	13:35	~~E-7~~ CAC E-13D	G	✓				4	[illegible]	1	1	
~~1/27/04~~												

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Catherine Cavagnaro	1/27/04	15:55						

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
FedEx								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

- [x] STL Savannah
  5102 LaRoche Avenue
  Savannah, GA 31404
  Website: www.stl-inc.com
  Phone: (912) 354-7858
  Fax: (912) 352-0165
- [ ] Alternate Laboratory Name/Location
  Phone:
  Fax:

PROJECT REFERENCE: Hercules Jefferson	PROJECT NO.: 01305	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Bill Baughman	CLIENT PHONE: 412-241-4500	CLIENT FAX:
CLIENT NAME: Cummings Riter	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 2 OF 2

STANDARD REPORT DELIVERY: X
DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE): ○
DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: --

MATRIX TYPE / REQUIRED ANALYSIS

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	VOC (Appendix 9)	SVOC (Appendix 9)	TDS	Dissolved metals (Appendix 9)							REMARKS
		PRESERVATIVE						HCL	—		HNO3							
								NUMBER OF CONTAINERS SUBMITTED										
—	—	TB1 (trip blank 1)		/				4	-	-	-							Additional VOC analysis for 3# compounds
—	—	DUP-01	G	/				4	2	1	1							1,2,4-Trimethylbenzene 1,3,5 Trimethylbenzene cis-1,2-Dichloroethene

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Catherine Cavagnaro	1/27/04	15:55						
RECEIVED BY: (SIGNATURE) FedEx	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

STL8240-680 (12/02)

Serial Number 10004

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules Jefferson	PROJECT NO.: 41205	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Bill Baughman	CLIENT PHONE: 412-241-4500	CLIENT FAX:
CLIENT NAME: Cummings Riter	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 ... Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF 1

STANDARD REPORT DELIVERY: X — DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE): ○ — DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: VOC (Appendix 9) / SVOC (Appendix 9) / TLS / Dissolved metals (Appendix 9)
PRESERVATIVE: HCL / — / HNO3

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	VOC (Appendix 9)	SVOC (Appendix 9)	TLS	Dissolved metals (Appendix 9)	REMARKS
1/27/04	17:05	E-49	G	✓				4	2	1	1	Additional VOC
1/27/04	16:40	E-23	G	✓				4	2	1	1	analysis ... 3
1/28/04	10:55	E-61	G	✓				4	2	1	1	compounds
1/28/04	10:55	E-61 MS	G	✓				4	2			1,2,4-Trimethylbenzene
1/28/04	10:55	E-61 MSD	G	✓				4	2			1,3,5-Trimethylbenzene
1/28/04	10:30	E-35	G	✓				4	2	1	1	cis-1,2-Dichloroethene
1/28/04	13:40	E-37	G	✓				4	2	1	1	
—	—	TB2 (trip blank 2)		✓				4				

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Catherine Cavagnaro	1/28/04	16:05						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
FedEx								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

STL8240-680 (12/02)

Serial Number 18081

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT STL

☑ STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules Jefferson	PROJECT NO.: 013105.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Bill Baughman	CLIENT PHONE: 412-241-4500	CLIENT FAX:
CLIENT NAME: Cummings Riter	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd. Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ☒ DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: VOC (Appendix 9); SVOC (Appendix 9); TDS; Dissolved metals (Appendix 9)
PRESERVATIVE: HCL; -; [illegible]; HNO3

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G)	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID	VOC	SVOC	TDS	Dissolved metals	REMARKS
—	—	TB3 (trip blank 3)		✓				4				Additional VOC
1/29/04	10:20	E-62	G	✓				4	2	1	1	analysis for 3 compounds
1/29/04	13:10	E-3AD	G	✓				4	2	1	1	
1/29/04	12:10	E-57	G	✓				4	2	1	1	2,4-Trimethylbenzene
1/29/04	15:10	E-14	G	✓				4	2	1	1	1,3,5-Trimethylbenzene
1/29/04	15:45	EQB1	G	✓				4	2	1	1	cis-1,2-Dichloroethene

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Catherine Carragnaro	1/29/04	16:10						
RECEIVED BY: (SIGNATURE) EMPTY CONTAINERS	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

L8240-680 (12/02)

Serial Number 18068

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Hercules Jefferson	21305.40	PA
STL (LAB) PROJECT MANAGER	**P.O. NUMBER**	**CONTRACT NO.**
Betsy Beauchamp		
CLIENT (SITE) PM	**CLIENT PHONE**	**CLIENT FAX**
Bill Baughman	412-241-4500	
CLIENT NAME	**CLIENT E-MAIL**	
Cummins Riter		
CLIENT ADDRESS		
10 Duff Rd Suite 500 Pittsburgh PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable)		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ⊗
DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT,...)

REQUIRED ANALYSIS: VOC / Appendix 9; SVOC / Appendix 9; TDS; Dissolved metals (Appendix-9)

PRESERVATIVE: HCl; –; ; HNO3

NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	C/G	AQUEOUS	SOLID	AIR	NONAQ.	VOC / Appendix 9	SVOC / Appendix 9	TDS	Dissolved metals							REMARKS
~~1/29/04~~	—	TB4 (Appendix 4)	G	✓				4										Additional VOC
1/30/04	09:20	E-43 should be E-54	G	✓				4	2	1	1							analysis for 3
1/30/04	10:55	E-24	G	✓				4	2	1	1							compounds:
1/30/04	13:05	E-17D	G	✓				4	2	1	1							1,2,4-Trimethylbenzene
1/29/04	16:55	E-46D	G	✓				4	2	1	1							1,3,5-Trimethylbenzene
1/29/04	16:20	W-15	G	✓				4	2	1	1							cis-1,2-Dichloroethene
1/30/04	15:10	E-8D	G	✓				4	2	1	1							
1/30/04	13:45	MW-F3	G	✓				4	2	1	1							
1/30/04	14:45	E-55	G	✓				4	2	1	1							
1/30/04	16:25	E-45D	G	✓				4	2	1	1							
1/30/04	16:00	E-51	G	✓				4	2	1	1							

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Katherine Magnaro	1/30/04	16:45						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 10069

SEVERN TRENT **STL**

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah (checked)
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules Jefferson	PROJECT NO.: 21205.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Beauchamp	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM: Bill Baughman	CLIENT PHONE: 412-241-4500	CLIENT FAX
CLIENT NAME: Civil & Environmental Consultants Inc / Ritter	CLIENT E-MAIL	
CLIENT ADDRESS: Kill Rd Suite 500 Pittsburgh PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable)		

PAGE 1 OF 1

STANDARD REPORT DELIVERY (X) — DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ( ) — DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: ...

REQUIRED ANALYSIS: VOC (Appendix 9); SVOC (Appendix 9); TDS; Dissolved metals (Appendix 9)

PRESERVATIVE: HCL; -; HNO3

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	VOC (Appendix 9)	SVOC (Appendix 9)	TDS	Dissolved metals (Appendix 9)	REMARKS
2/2/04	13:55	E-29	G	✓				4	2	1	1	Additional VOC
2/2/04	15:25	E-48	G	✓				4	2	1	1	analysis for 3#
2/2/04	13:10	E-40	G	✓				4	2	1	1	compounds /
2/2/04	15:05	E-34	G	✓				4	2	1	1	1,2,4-Trimethylbenzene
—	—	TB5 (trip blanks)	G	✓				4				1,3,5-Trimethylbenzene
—	—	DUP-02	G	✓				4	2	1	1	cis-1,2-Dichloroethene
2/3/04	15:10	W-2A	G	✓				4	2	1	1	
2/3/04	14:35	E-53	G	✓				4	2	1	1	
2/3/04	16:05	E-56	G	✓				4	2	1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Cavagnaro	2/3/04	16:20						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ( ) NO ( )			

Serial Number 18070

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules Jefferson	PROJECT NO.: 01305	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Bill Baughman	CLIENT PHONE: 412-241-4500	CLIENT FAX:
CLIENT NAME: Cummings Riter	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF 2

STANDARD REPORT DELIVERY: X
DATE DUE:
EXPEDITED REPORT DELIVERY (SURCHARGE): ○
DATE DUE:
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: VOC (Appendix 9); SVOC (Appendix 9); TDS; Dissolved metals (Appendix 9)

PRESERVATIVE: HCL; –; –; HNO_3

Sample Date	Sample Time	Sample Identification	Composite (C) or Grab (G)	Aqueous (Water)	Solid or Semisolid	Air	Nonaqueous Liquid	VOC (Appendix 9)	SVOC (Appendix 9)	TDS	Dissolved metals (Appendix 9)	Remarks
2/4/04	09:25	MW-F2	G	✓				4	2	1	1	Additional VOC
2/4/04	09:55	E-47D	G	✓				4	2	1	1	analysis for 3#
2/4/04	09:55	E-47D MS	G	✓				4	2			compounds
2/4/04	09:55	E-47D MSD	G	✓				4	2			1,2,4-Trimethylbenzene
—	—	TB6 (tripblank6)	G	✓				4				1,3,5-Trimethylbenzene
2/4/04	11:05	E-27	G	✓				4	2	1	1	cis-1,2-Dichloroethene
2/4/04	12:40	EQB2	G	✓				4	2	1	1	
2/4/04	12:40	MW-F1	G	✓				4	2	1	1	
2/4/04	15:30	EQB3	G	✓				4	2	1	1	
—	—	DUP-03	G	✓				4	2	1	1	
2/4/04	14:40	MW-5	G	✓				4	2	1	1	
2/4/04	14:40	MW-5 MS	G	✓				4	2			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Catherine Cavagnaro	16:20	2/4/04						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Fed Ex								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

STL8240-680 (12/02)

Serial Number 18071

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

☒ **STL Savannah**
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

◯ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	Hercules Jefferson
PROJECT NO.	01305
PROJECT LOCATION (STATE)	PA
STL (LAB) PROJECT MANAGER	Betsy Beauchamp
P.O. NUMBER	
CONTRACT NO.	
CLIENT (SITE) PM	Bill Baughman
CLIENT PHONE	412-241-4500
CLIENT FAX	
CLIENT NAME	Cummings Riter
CLIENT E-MAIL	
CLIENT ADDRESS	10 Duff Rd Suite 500 Pittsburgh PA 15235
COMPANY CONTRACTING THIS WORK (if applicable)	
PAGE	2 OF 2
STANDARD REPORT DELIVERY	☒
DATE DUE	
EXPEDITED REPORT DELIVERY (SURCHARGE)	◯
DATE DUE	
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	

MATRIX TYPE / REQUIRED ANALYSIS

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	VOC (Appendix 9)	SVOC (Appendix 9)	TDS	Dissolved metals (Appendix 9)						REMARKS
		PRESERVATIVE						HCL	—		HNO3						
2/4/04	14:40	MW-5 MSD	G	✓				4	2								Additional VOC analysis for 3# compounds 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene cis-1,2-Dichloroethene

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[illegible signature]	2/4/04	16:20						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ◯ NO ◯			

L8240-680 (12/02)

Serial Number 18072

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules / Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: William Baughman	CLIENT PHONE: 412 241-4500	CLIENT FAX: 412 241-7500
CLIENT NAME: Consultants Cummings/Riter	CLIENT E-MAIL:	
CLIENT ADDRESS: 500 Duff Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY: X
DATE DUE ___
EXPEDITED REPORT DELIVERY (SURCHARGE): ○
DATE DUE ___
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

REQUIRED ANALYSIS: VOC's (Appendix IX) — Preservative: HCL; SVOC's (Appendix IX); Dissolved Metals (Appendix IX) — Preservative: HNO3; TDS

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT,...)

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	C/G	AQUEOUS	SOLID	AIR	NONAQ.	VOC's	SVOC's	Dissolved Metals	TDS	REMARKS
2/5/04	9:40	E-28-D	G	X				4	2	1	1	Additional VOC
—	—	TB-7 (Trip Blank 7")		X				4				Analysis for 3 Compounds
												1,2,4 Trimethylbenzene
												1,3,5 Trimethylbenzene
												Cis-1,2 Dichloroethene

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	2/5/04	13:15						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Fed-Ex F4497 5048899	2/5/04	13:15						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 23600

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules/Jefferson	PROJECT NO.: 01385.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM: Cameron Nix	CLIENT PHONE: (412) 241-4500	CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings Riter	CLIENT E-MAIL	
CLIENT ADDRESS: 10 Duff Rd, Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable)		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ● DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

REQUIRED ANALYSIS: APIX SVOC
PRESERVATIVE: 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	NUMBER OF CONTAINERS SUBMITTED (APIX SVOC)	REMARKS
2-11-04	1350	E-28D	G	X				3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature] EMPTY CONTAINERS	2/11/04	1600						
RECEIVED BY: (SIGNATURE) EMPTY CONTAINERS	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson Plant
PROJECT NO.: 01305.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: William Baughman
CLIENT PHONE: (412) 241-4500
CLIENT FAX: (412) 241-7500
CLIENT NAME: CRC for Hercules Inc
CLIENT E-MAIL: wbaughman@cummingsriter.com
CLIENT ADDRESS: 10 Duff Rd., Suite 500, Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 1
STANDARD REPORT DELIVERY ● DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE / AQUEOUS (WATER) / SOLID OR SEMISOLID / AIR / NONAQUEOUS LIQUID (OIL, SOLVENT,...)

REQUIRED ANALYSIS — NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G)	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID	App IX VOCs	App IX SVOCs	App IX Inorganic	TDS	REMARKS
3/1/04	09:25	E-21		X				4	2	1	1	App IX VOCs
3/1/04	09:47	E-28D		X				4	2	1		also to include
3/1/04	10:20	W-1A		X				4	2	1	1	1,2,4 & 1,3,5-
3/1/04	11:40	E-59		X				4	2	1		trimethylbenzene
3/1/04	11:25	W-7		X				4	2	1	1	and cis-1,2-DCE
3/1/04	13:40	E-46D		X				4	2	1		App IX inorganic
3/1/04	13:10	E-47D		X				4	2	1		samples have
3/1/04	15:05	E-17D		X				4	2	1		been field
3/1/04	15:12	E-60		X				4	2	1		filtered.
3/1/04	16:35	E-13D		X				4	2	1		
3/1/04	16:35	E-45D		X				4	2	1		
—	—	TB-		X				4				

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			[signature]	3-1-04	16:15			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS			FedEx	3-1-04	18:15			

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 34974

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT STL

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson
PROJECT NO.: 01305.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: William Baughman
CLIENT PHONE: (412) 241-4500
CLIENT FAX: (412) 241-0500
CLIENT NAME: Hercules Inc
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Road Suite 500, Pittsburgh
COMPANY CONTRACTING THIS WORK (if applicable): Cummings / Riter

PAGE 1 OF 1

STANDARD REPORT DELIVERY: ● DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE): ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	App IX VOCs	App IX SVOCs	App IX Inorganics							REMARKS
3-2-04	09:48	E-62	G	X				4	2	1							App IX Inorganics have
3-2-04	11:30	E-63	G	X				4	2	1							been field filtered
3-2-04	11:30	E-63 / MS	G	X				4	2	1							Matrix Spike
3-2-04	11:30	E-63 / MSD	G	X				4	2	1							Matrix Spike Dup
3-2-04	09:55	E-3AD	G	X				4	2	1							App IX VOCs to also
3-2-04	11:20	E-8D	G	X				4	2	1							include 1,2,4 & 1,3,5-
3-2-04	12:20	E-61	G	X				4	2	1							trimethylbenzene &
3-2-04	13:00	FB-1	G	X				4	2	1							cis-1,2-DCE
—	—	TB-2		X				4									Trip Blank #2
3-2-04	—	DUP-1	G	X				4	2	1							Duplicate #1

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
			[signature]	3-2-04	16:15			

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
			FedEx	3-2-04	16:15			

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 11112

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson Plant
PROJECT NO.: 01305.410
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: William Baughman
CLIENT PHONE: 412-241-4500
CLIENT FAX: 412-241-7500
CLIENT NAME: Cummings Riter
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Road Suite 500, Pittsburgh PA
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 1
STANDARD REPORT DELIVERY: (selected)
DATE DUE
EXPEDITED REPORT DELIVERY (SURCHARGE)
DATE DUE
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT,...)

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	C/G	AQUEOUS	SOLID	AIR	NONAQUEOUS	VOCs App IX	SVOCs App IX	Metals App IX	REMARKS
3/2/04	7:16	36" Pipe Influent	G	X				4	2	1	App IX VOCs to also include 1,2,4 & 1,3,5-trimethylbenzene & cis-1,2-DCE
↓	9:05	On-Site Culvert	↓	X				4	2	1	
↓	9:40	36" Pipe Effluent	↓	X				4	2	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS [signature]	3/2/04	10:00				Cameron L Mc[illegible]	3/2/04	16:15

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Cameron L Mc[illegible]	3/2/04	10:00	FedEx	3/2/04	16:15

LABORATORY USE ONLY
RECEIVED FOR LABORATORY BY (SIGNATURE) | DATE | TIME | CUSTODY INTACT | CUSTODY SEAL NO. | STL SAVANNAH LOG NO. | LABORATORY REMARKS

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

(X) **STL Savannah**
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

( ) Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: William Baughman	CLIENT PHONE: (412) 241-4500	CLIENT FAX: 241-7500
CLIENT NAME: Hercules Inc.	CLIENT E-MAIL:	
CLIENT ADDRESS:		
COMPANY CONTRACTING THIS WORK (if applicable): Cummings / Riter		

PAGE 1 OF

STANDARD REPORT DELIVERY (X) DATE DUE

EXPEDITED REPORT DELIVERY (SURCHARGE) ( ) DATE DUE

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: App IX VOCs; App IX SVOCs; App IX Metals — PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	App IX VOCs	App IX SVOCs	App IX Metals	REMARKS
12-12-03	9:00	TF-8 (0-2)	X		X			4	1	1	
12-12-03	9:45	TF-8 (6-9.5)	X		X			4	1	1	
12-12-03	10:20	TF-9 (0-2)	X		X			4	1	1	
12-12-03	10:55	TF-9 (5.5-7)	X		X			4	1	1	
12-12-03	11:35	TF-4 (0-2)	X		X			4	1	1	
12-12-03	12:10	TF-4 (4-6)	X		X			4	1	1	
12-12-03	13:15	TF-2 (0-2)	X		X			4	1	1	
12-12-03	14:00	TF-2 (6-8)	X		X			4	1	1	
12-12-03	10:08	UP-6 (10-12)	X		X			4	1	1	
12-12-03	11:15	UP-8 (14-16)	X		X			4	1	1	
—	—	TB-9		X				3			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12-12-03	16:30						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx 839875280440	12-12-03	16:30						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ( ) NO ( )			

L8240-680 (12/02)

Serial Number 25755

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT STL

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Carmin Nix	CLIENT PHONE: (412)241-4500	CLIENT FAX: (412)241-7500
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd. Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 2 OF 2

STANDARD REPORT DELIVERY ● DATE DUE ______

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: AP IX VOCs; AP IX VOCs

PRESERVATIVE: 1; HCl

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS
12/11/03	1600	UP-5(6-8)	C		X			4										

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS [signature]	12/11/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 23709

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson
PROJECT NO.: 013.05.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Cameron Nix
CLIENT PHONE: (412) 241-4500
CLIENT FAX: (412) 241-4500
CLIENT NAME: Cummings/Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 2
STANDARD REPORT DELIVERY: ● DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE): ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: APIX VOCs (PRESERVATIVE: —); APIX VOCs (PRESERVATIVE: HCl)

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	APIX VOCs	APIX VOCs (HCl)								REMARKS
12/11/03	—	TB-8		X					3								
11	0822	LP-2 (0-2)	C		X			4									
11	0822	LP-2 (0-2)/MS	C		X			4									matrix spike
11	0822	LP-2 (0-2)/MSD	C		X			4									matrix spike dup
11	0935	LP-2 (14.7-16.7)	C		X			4									
11	1055	LP-3 (19.5-21.5)	C		X			4									
—	—	Dup-3	C		X			4									
12/11/03	1205	UP-7 (14-16)	C		X			4									
—	—	Dup-4	C		X			4									
12/11/03	1255	UP-5 (0-2)	C		X			4									
11	1255	UP-5 (0-2)/MS	C		X			4									
11	1255	UP-5 (0-2)/MSD	C		X			4									

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/11/03	1630						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

8240-680 (12/02)

Serial Number 23704

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Cameron Nix	CLIENT PHONE: (412) 241-4500	CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ● DATE DUE ______

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: APIX Metals; APIX SVOCs

PRESERVATIVE: 1 | 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	APIX Metals (No. of containers)	APIX SVOCs (No. of containers)	REMARKS
12/11/07	0822	LP-2 (0-2)	C		X			1	1	
〃	0822	LP-2 (0-2)/MS	C		X			1	1	matrix spike
〃	0822	LP-2 (0-2)/MSD	C		X			1	1	matrix spike dup
〃	0935	LP-2 (14.7-16.7)	C		X			1	1	
〃	1055	LP-3 (19.5-21.5)	C		X			1	1	
—	—	Dup-3	C		X			1	1	
12/11/07	1205	UP-7 (14-16)	C		X			1	1	
—	—	Dup-4	C		X			1	1	
12/11/07	1255	UP-5 (0-2)	C		X			1	1	
〃	1255	UP-5 (0-2)/MS	C		X			1	1	
〃	1255	UP-5 (0-2)/MSD	C		X			1	1	
〃	1600	UP-5 (6-8)	C		X			1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature] EMPTY CONTAINERS	12/11/07	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

STL8240-680 (12/02)

Serial Number 25038

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Cameron Nix	CLIENT PHONE: (412) 241-4500	CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF 1

STANDARD REPORT DELIVERY ● DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	APIX metals (1)	APIX SVOCs (1)	APIX VOCs	APIX VOCs (HCl)						REMARKS
12/9/03	—	TB-8		X							3						
11	0810	LP-8(0-2)	C		X			1	1	4							
11	0910	LP-8(15-17)	C		X			1	1	4							
11	1135	LP-6(0-2)	C		X			1	1	4							
11	1317	LP-6(22-24)	C		X			1	1	4							
11	1400	LP-7(0-2)	C		X			1	1	4							
11	1505	LP-7(18-20)	C		X			1	1	4							
11	1540	LP-5(0-2)	C		X			1	1	4							
11	1625	LP-5(21-23)	C		X			1	1	4							

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/9/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

STL8240-680 (12/02)

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Heinz - Jefferson
PROJECT NO.: 01305.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Cameron Nix
CLIENT PHONE: (412) 241-4500
CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings/Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 1
STANDARD REPORT DELIVERY ●
DATE DUE
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: AP IX metals | AP IX SVOCs | AP IX VOCs | AP IX VOCs
PRESERVATIVE: 1 | 1 | | HCl

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	AP IX metals	AP IX SVOCs	AP IX VOCs	AP IX VOCs	REMARKS
12/8/03	—	TB-7		X							3	
11	0910	TF-3 (0-2)	C		X			1	1	4		
11	0930	TF-3 (7.4-9.4)	C		X			1	1	4		
11	1010	TF-1 (0-2)	C		X			1	1	4		
11	1035	TF-1 (9.7-11.7)	C		X			1	1	4		
11	1105	TF-5 (0-2)	C		X			1	1	4		
11	1130	TF-5 (7.7-9.7)	C		X			1	1	4		
11	1255	TF-6 (0-2)	C		X			1	1	4		
11	1355	TF-6 (14-16)	C		X			1	1	4		
11	1515	LP-9 (5.6-7.6	C		X			1	1	4		

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/8/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

STL8240-680 (12/02)

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Heinlein-Jefferson
PROJECT NO.: 01305.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Carmen Nix
CLIENT PHONE: (412)241-4500
CLIENT FAX: (412)241-7500
CLIENT NAME: Cummings/Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd. Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 1
STANDARD REPORT DELIVERY ●
DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: APIX VOCs (PRESERVATIVE: /) ; APIX VOCs (PRESERVATIVE: HCl)

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	APIX VOCs (/)	APIX VOCs (HCl)	REMARKS
12/5/03	—	TB-6		X					3	
11	1210	FB-2		X					4	
11	0945	V-1 (0-2)	C		X			4		
—	—	Dup-2	C		X			4		
12/5/03	1120	V-1 (12.9-14.9)	C		X			4		
11	1220	V-2 (17.5-19.5)	C		X			4		
11	1330	V-3 (0-2)	C		X			4		
11	1405	V-3 (15-17)	C		X			4		
11	1525	UP-9 (16.5-14.5)	C		X			4		

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/5/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

Serial Number 23148

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Cameron Nix	CLIENT PHONE: (412) 241-4500	CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF

STANDARD REPORT DELIVERY ● DATE DUE ______

EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: AP IX Metals | AP IX SVOCs | AP IX Metals

PRESERVATIVE: — | — | Nitric Acid

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	AP IX Metals	AP IX SVOCs	AP IX Metals (Nitric Acid)	REMARKS
12/5/03	1210	FB-2		X					2	1	Field Blank
11	0945	V-1 (0-2)	C		X			1	1		
—	—	Dup-2	C		X			1	1		
12/5/03	1120	V-1 (12.9-14.9)	C		X			1	1		
11	1220	V-2 (17.5-19.5) X X	C		X			1	1		
11	1330	V-3 (0-2)	C		X			1	1		
11	1405	V-3 (15-17)	C		X			1	1		
11	1525	UP-9 (16.5-18.5)	C		X			1	1		

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/5/03	1630						
RECEIVED BY: (SIGNATURE) EMPTY CONTAINERS	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

Serial Number

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
Hercules - Jefferson	01305.40	PA	2	2

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Cameron Mix	(412) 241-4500	(412) 241-7500

CLIENT NAME: Cummings/Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd. Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

STANDARD REPORT DELIVERY (selected) DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: APIX VOCs
PRESERVATIVE: 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	NUMBER OF CONTAINERS SUBMITTED: APIX VOCs	REMARKS
12/4/03	1516	UP-4 (0-2)	C		X			4	
11	1545	UP-4 (9.6-11.6)	C		X			4	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature] EMPTY CONTAINERS	12/4/03	1630						

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES / NO	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

STL8240-680 (12/02)

Serial Number 2004[illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson
PROJECT NO.: 01305.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Cameron Mix
CLIENT PHONE: (412) 241-4500
CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings / Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd. Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 2

STANDARD REPORT DELIVERY ● DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: APIX VOCs (preservative: —); APIX VOCs (preservative: HCl)

PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	APIX VOCs (—)	APIX VOCs (HCl)									REMARKS
12/4/03	—	TB-5		X				3										Trip Blank
11	1615	FB-1		X					4									Field Blank
11	0825	LP-1 (0-2)	C		X			4										
11	0920	LP-1 (15.1-17.1)	C		X			4										
11	1030	LP-10 (16-18)	C		X			4										
11	1150	UP-3 (15.3-17.3)	C		X			4										
11	1250	UP-1 (0-2)	C		X			4										
11	1250	UP-1 (0-2)/MS	C		X			4										matrix spike
11	1250	UP-1 (0-2)/MSD	C		X			4										matrix spike dup
11	1355	UP-1 (13.7-15.7)	C		X			4										
11	1425	UP-2 (0-2)	C		X			4										
11	1450	UP-2 (13.5-15.5)	C		X			4										

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature] EMPTY CONTAINERS	12/4/03	1630						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

STL8240-680 (12/02)

Serial Number 23141

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

◯ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	PAGE	OF
Hercules - Jefferson	01305.40	PA	2	2

STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.

CLIENT (SITE) PM	CLIENT PHONE	CLIENT FAX
Cameron Nix	(412) 241-4500	(412) 241-7500

CLIENT NAME	CLIENT E-MAIL
Cummings/Riter Consultants	

CLIENT ADDRESS: 10 Duff Rd. Suite 500 Pittsburgh, PA 15235

COMPANY CONTRACTING THIS WORK (if applicable):

STANDARD REPORT DELIVERY: ● DATE DUE ______

EXPEDITED REPORT DELIVERY (SURCHARGE): ◯ DATE DUE ______

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2

REQUIRED ANALYSIS: AP IX Metals; AP IX SVOCs

PRESERVATIVE: 1 | 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	AP IX Metals (NUMBER OF CONTAINERS SUBMITTED)	AP IX SVOCs (NUMBER OF CONTAINERS SUBMITTED)	REMARKS
12/4/03	1545	UP-4 (9.6-11.6)	C		X			1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/4/03	1630						

RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
ADDY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ◯ NO ◯			

Serial Number 20041

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA	PAGE 1 OF 2
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY ● DATE DUE ______
CLIENT (SITE) PM: Cameron Nix	CLIENT PHONE: (412)241-4500	CLIENT FAX: (412)241-7500	EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:		
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235			NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 2
COMPANY CONTRACTING THIS WORK (if applicable):			

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	AP IX metals	AP IX SVOCs	~~AP IX VOCs~~	AP IX metals						REMARKS
		PRESERVATIVE						1	1		Metals Acid						
12/4/03	1615	FB-1		X					2		1						
11	0825	LP-1 (0-2)	C		X			1	1								
11	0920	LP-1 (15.1-17.1)	C		X			1	1								
11	1030	LP-10 (16-18)	C		X			1	1								
11	1150	UP-3 (15.3-17.3)	C		X			1	1								
11	1250	UP-1 (0-2)	C		X			1	1								
11	1250	UP-1 (0-2)/MS	C		X			1	1								Matrix spike
11	1250	UP-1 (0-2)/MSD	C		X			1	1								Matrix spike dup
11	1355	UP-1 (13.7-15.7)	C		X			1	1								
11	1425	UP-2 (0-2)	C		X			1	1								
11	1450	UP-2 (13.5-15.5)	C		X			1	1								
11	1516	UP-4 (0-2)	C		X			1	1								

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12/4/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 2[illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: Carmen Mix	CLIENT PHONE: (412) 241-4500	CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 1 OF 1
STANDARD REPORT DELIVERY ● DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

Required analysis: APIX metals (1), APIX SVOCs (1), APIX VOCs — PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G)	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID	APIX metals	APIX SVOCs	APIX VOCs	REMARKS
12/3/03	—	TB-4		X						3	
11	1100	C-3 (0-2)	C		X			1	1	4	
11	1152	C-3 (14-16)	C		X			1	1	4	
11	1245	C-2 (0-2)	C		X			1	1	4	
11	1325	C-2 (14-16)	C		X			1	1	4	
11	1410	C-1 (0-2)	C		X			1	1	4	
11	1800	C-1 (17.5-19.5)	C		X			1	1	4	
11	1555	LP-4 (14-16)	C		X			1	1	4	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature] EMPTY CONTAINERS	12/3/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

L8240-680 (12/02)

Serial Number

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules-Jefferson
PROJECT NO.: 01305.40
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Cameron Mix
CLIENT PHONE: (412) 241-4500
CLIENT FAX: (412) 241-7500
CLIENT NAME: Cummings/Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 1
STANDARD REPORT DELIVERY ● DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT,...)

REQUIRED ANALYSIS: AP IX Metals; AP IX SVOCs; AP IX VOCs

PRESERVATIVE: 1 | 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	C/G	AQUEOUS	SOLID	AIR	NONAQ.	AP IX Metals	AP IX SVOCs	AP IX VOCs	REMARKS
12-2-03	0933	FP-3 (14-16)	C		X			1	1	4	
12-2-03	1105	FP-4 (17.5-19.5)	C		X			1	1	4	
—	—	Dup-1	C		X			1	1	4	
12-2-03	1300	FP-1 (13.6-15.6)	C		X			1	1	4	
12-2-03	~~[illegible]~~ 1340	C-6 (0-2)	C		X			1	1	4	
12-2-03	1340	C-6 (0-2) /MS	C		X			1	1	4	
12-2-03	1340	C-6 (0-2) / MSD	C		X			1	1	4	
12-2-03	1450	C-6 (13.5-15.5)	C		X			1	1	4	
12-2-03	1520	C-4 (0-2)	C		X			1	1	4	
12-2-03	1610	C-4 (14-16)	C		X			1	1	4	
—	—	TB		X						3	

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12-2-03	1630						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson
PROJECT NO.: 03366.10
PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER:
P.O. NUMBER:
CONTRACT NO.:
CLIENT (SITE) PM: Cameron Nix
CLIENT PHONE: (412)241-4500
CLIENT FAX: (412)241-7500
CLIENT NAME: Cummings/Riter Consultants
CLIENT E-MAIL:
CLIENT ADDRESS: 10 Duff Rd, Suite 500 Pittsburgh, PA 15235
COMPANY CONTRACTING THIS WORK (if applicable):

PAGE 1 OF 1
STANDARD REPORT DELIVERY (marked)
DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE)
DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS: AP IX - Metals (1), AP IX - SVOCs (1), AP IX - VOCs (PRESERVATIVE)

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL; SOLVENT,...)	AP IX - Metals	AP IX - SVOCs	AP IX - VOCs							REMARKS
11/25/03	1050	SB-1 (14-16)	C		X			1	1	4							
"	1335	SB-2 (11.5-13.5)	C		X			1	1	4							
"	1120	SB-3 (14-16)	C		X			1	1	4							
"	1300	SB-4 (8-10)	C		X			1	1	4							
"	1445	SB-5 (12-14)	C		X			1	1	4							
"	0955	SB-6 (11-13)	C		X			1	1	4							
"	1535	FP-2 (14.5-16.5)	C		X			1	1	4							
—	—	Trip Blank		X						3							

NUMBER OF CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature] EMPTY CONTAINERS	11/25/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ◯ NO ◯	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

L8240-680 (12/02)

Serial Number 24710

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: Hercules/Jefferson	PROJECT NO.: 03366.10	PROJECT LOCATION (STATE): PA	PAGE 1 OF 1
STL (LAB) PROJECT MANAGER:	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY ● DATE DUE ___
CLIENT (SITE) PM: Cameron Nix	CLIENT PHONE: (412) 241-4500	CLIENT FAX: (412) 241-7500	EXPEDITED REPORT DELIVERY (SURCHARGE) ○ DATE DUE ___
CLIENT NAME: Cummings/Riter Consultants	CLIENT E-MAIL:		
CLIENT ADDRESS: 10 Duff Rd., Suite 500 Pittsburgh, PA 15235			NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1
COMPANY CONTRACTING THIS WORK (if applicable):			

MATRIX TYPE / REQUIRED ANALYSIS / NUMBER OF CONTAINERS SUBMITTED (PRESERVATIVE)

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	AP IX VOCs	AP IX SVOCs	AP IX Metals							REMARKS
								1	1								
11/24/03	0924	SC-1 (0-2)	C		X			X	X	X							
〃	0910	SC-2 (0-2)	C		X			X	X	X							
〃	1015	SC-3 (0-2	C		X			X	X	X							
〃	1135	C-5 (0-2)	C		X			X	X	X							
〃	1118	C-7 (0-2	C		X			X	X	X							
—	—	Trip Blank						X									

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	11/24/03	1630						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

STL8240-680 (12/02)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PAGE 2 OF 2

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE):
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: William Baughman	CLIENT PHONE: (412) 241-4500	CLIENT FAX: 241-7500
CLIENT NAME: Joe Keller	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd, Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable): Hercules Inc		

STANDARD REPORT DELIVERY: X
DATE DUE ____
EXPEDITED REPORT DELIVERY (SURCHARGE): ○
DATE DUE ____
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	App IX VOCs	App IX SVOCs	TAL metals	TDS	REMARKS
12-8-03	14:15	SW-1	G	X				4	2	1	1	
12-8-03	14:15	SW-1 /MS	G	X				4	2	1	1	Matrix Spike
12-8-03	14:15	SW-1 /MSD	G	X				4	2	1	1	Matrix Spike Dup
12-8-03	14:30	SD-1	G		X			4	1	1		
12-8-03	15:00	EQB-1	G	X				4	2	1	1	Equipment Blank
—	—	TB-1	G	X				4				Trip Blank #1

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12-8-03	16:30						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Fedex 839815280428	12-8-03	16:30						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Serial Number 24034

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Hercules - Jefferson	PROJECT NO.: C1305.90	PROJECT LOCATION (STATE):
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: William Baughman	CLIENT PHONE: (412) 241-4500	CLIENT FAX: 241-7500
CLIENT NAME: Joe Keller	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd., Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable): Hercules, Inc.		

PAGE 1 OF 2

STANDARD REPORT DELIVERY: ⊗
DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE): ○
DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE; AQUEOUS (WATER); SOLID OR SEMISOLID; AIR; NONAQUEOUS LIQUID (OIL, SOLVENT,...)

REQUIRED ANALYSIS — PRESERVATIVE — NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	C/G	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID	AppIX VOCs	AppIX SVOCs	TAL Metals	TDS	REMARKS
12-8-03	10:25	SW-5	G	X				4	2	1	1	Please don't
—	—	DUP-1	G	X				4	2	1	1	analyze for
12-8-03	10:45	SD-5	G		X			4	1	1		TDS until
12-8-03	11:15	SW-4	G	X				4	2	1	1	notified.
12-8-03	11:25	SD-4	G		X			4	1	1		
—	—	DUP-1	G		X			4	1	1		
12-8-03	11:50	SW-3	G	X				4	2	1	1	
12-8-03	12:00	SD-3	G		X			4	1	1		
12-8-03	13:20	SW-2	G	X				4	2	1	1	
12-8-03	13:25	SD-2	G		X			4	1	1		
12-8-03	13:25	SD-2 / MS	G		X			4	1	1		Matrix Spike
12-8-03	13:25	SD-2 / MSD	G		X			4	1	1		Matrix Spike Dup

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12-8-03	16:30						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx 839895280428	12-8-03	16:30						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

☒ STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

◯ Alternate Laboratory Name/Location
Phone:
Fax:

PAGE 2 OF 2

PROJECT REFERENCE: Hercules-Jefferson	PROJECT NO.: 01305.40	PROJECT LOCATION (STATE):
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE) PM: William Baughman	CLIENT PHONE: (412) 241-4500	CLIENT FAX: 241-7500
CLIENT NAME: Joe Keller	CLIENT E-MAIL:	
CLIENT ADDRESS: 10 Duff Rd, Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable): Hercules Inc		

STANDARD REPORT DELIVERY: ☒ DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE): ◯ DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,....)	App IX VOCs	App IX SVOCs	TAL metals	TDS	REMARKS
12-8-03	14:15	SW-1	G	X				4	2	1	1	
12-8-03	14:15	SW-1 /MS	G	X				4	2	1	1	Matrix Spike
12-8-03	14:15	SW-1 /MSD	G	X				4	2	1	1	Matrix Spike Dup
12-8-03	14:30	SD-1	G		X			4	1	1		
12-8-03	15:00	EQB-1	G	X				4	2	1	1	Equipment Blank
—	—	TB-1	G	X				4				Trip Blank #1

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12-8-03	16:30						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx 8518 1528 0428	12-8-03	16:30						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ◯ NO ◯			

Serial Number [illegible]

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

○ Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Hercules - Jefferson	01305.40	
STL (LAB) PROJECT MANAGER: Betsy Beauchamp	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM: William Baughman	CLIENT PHONE: (412) 241-4500	CLIENT FAX: 241-7500
CLIENT NAME: Joe Keller	CLIENT E-MAIL	
CLIENT ADDRESS: 10 Duff Rd., Pittsburgh, PA 15235		
COMPANY CONTRACTING THIS WORK (if applicable): Hercules, Inc.		

PAGE 1 OF 2

STANDARD REPORT DELIVERY ☒
DATE DUE ______
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE ______
NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE / REQUIRED ANALYSIS / PRESERVATIVE / NUMBER OF CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	AppIX VOCs	AppIX SVOCs	TAL Metals	TDS	REMARKS
12-8-03	10:25	SW-5	G	X				4	2	1	1	Please don't
—	—	DUP-1	G	X				4	2	1	1	analyze for
12-8-03	10:45	SD-5	G		X			4	1	1		TDS until
12-8-03	11:15	SW-4	G	X				4	2	1	1	notified.
12-8-03	11:25	SD-4	G		X			4	1	1		
—	—	DUP-1	G		X			4	1	1		
12-8-03	11:50	SW-3	G	X				4	2	1	1	
12-8-03	12:00	SD-3	G		X			4	1	1		
12-8-03	13:20	SW-2	G	X				4	2	1	1	
12-8-03	13:25	SD-2	G		X			4	1	1		
12-8-03	13:25	SD-2 / MS	G		X			4	1	1		Matrix Spike
12-8-03	13:25	SD-2 / MSD	G		X			4	1	1		Matrix Spike Dup

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	12-8-03	16:30						
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
FedEx 839895280428	12-8-03	16:30						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
			YES ○ NO ○			

Chain of Custody Record

STL4124-400 (12/02)

SEVERN TRENT **STL**
Severn Trent Laboratories, Inc.

STL Pensacola
3355 McLemore Drive
Pensacola, FL 32514

Client: Cummings / Riter Consultants	Project Manager: William Baughman	Date: 1/9/04	Chain of Custody Number: 07605
Address: 10 Duff Road, Suite 500	Telephone Number (Area Code)/Fax Number: (412) 241-4500 / (412) 241-7500	Lab Number	Page 1 of 1
City: Pittsburgh State: PA Zip Code: 15235	Site Contact: Joe Keller · Lab Contact: Lance Larson	Analysis (Attach list if more space is needed)	
Project Name and Location (State): Hercules - Jefferson Plant	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil		Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Summa	Benzene	Toluene	Ethylbenzene	Xylene	Styrene	Naphthalene							Special Instructions/Conditions of Receipt
V-8 Control Building	1/9/04	07:55	X											X	X	X	X	X	X	X							

(Matrix: Air, Aqueous, Sed., Soil; Containers & Preservatives: Unpres., H2SO4, HNO3, HCl, NaOH, ZnAc/NaOH, Summa)

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☒ 21 Days ☐ Other ____

QC Requirements (Specify)

Relinquished By	Date	Time	Received By	Date	Time
1. Cameron J. Mix	1/12/04	14:00	1. UPS	1/12/04	14:00
2.			2.		
3.			3.		

Comments: Sample collected over an 8-hr period. Sample time represents the beginning of sample period.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain o[illegible] Custody [illegible]cord

STL Pensacola
3355 McLemore Drive
Pensacola, FL 32514

SEVERN TRENT SERVICES
Severn Trent Labora[illegible]ries, Inc.

STL-4124 (1200) PEN (1100)

Client	[illegible] Cummings/Riter Consultants
Address	10 Duff Rd., Suite 500
City	Pittsburgh
State	PA
Zip Code	15235
Project Name and Location (State)	Hercules - West Elizabeth, PA
Contract/Purchase Order/Quote No.	
Project Manager	William Baughman
Telephone Number (Area Code)/Fax Number	(412) 241-4500 / (412) 241-7500
Site Contact	Joe Keller
Lab Contact	Lance Larson
Carrier/Waybill Number	
Date	1/8/04
Lab Number	
Chain of Custody Number	062609
Page	1 of 1

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH	Summa	Analysis: Benzene	Toluene	Ethylbenzene	Xylene	Styrene	Naphthalene	Special Instructions/ Conditions of Receipt
WW Poly	1/8/04	8:10	X											X	X	X	X	X	X	X	
MP Poly	1/8/04	8:15	X											X	X	X	X	X	X	X	
Pilot Plant	1/8/04	8:25	X											X	X	X	X	X	X	X	
C-5 Warehouse	1/8/04	8:40	X											X	X	X	X	X	X	X	
DUP-1	1/8/04	—	X											X	X	X	X	X	X	X	Duplicate #1
Field Blank	1/8/04	8:50	X											X	X	X	X	X	X	X	

Analysis (Attach list if more space is needed)

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☒ 21 Days ☐ Other____

QC Requirements (Specify)

1. Relinquished By: Cameron S. [illegible]	Date: 1/9/04	Time	1. Received By	Date	Time
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments
Samples were collected over a 8-hr period. Sample time is the beginning of the sampling period.

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

APPENDIX D

LABORATORY ANALYTICAL REPORTS
(ON COMPACT DISK)

CUMMINGS
RITER