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June 13, 2012

Mr. Scott Miller
US Environmental Protection Agency
Superfund Remedial Branch, Section C
Atlanta Federal Center
61 Forsyth Street S.W.
Atlanta, GA 30303

Subject: Technical Critique of the 2011 USGS Report

Dear Mr. Miller:

Attached please find the report "Technical Critique of the 2011 USGS Report Entitled: *Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010*" prepared by Geosyntec Consultants, Inc. on behalf of The Advertiser Company.

The report is submitted for inclusion in the administrative record of the Capitol City Plume Superfund Site located in Montgomery, Alabama (EPA ID: AL0001058056), pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 113(j) and (k). 42 U.S.C. § 9613(j)(k).

A hard copy of the report addressed to EPA Region 4 will follow in the mail. We look forward to further discussions with USEPA.

Sincerely,

Robert Veenstra
Principal

Attachment Technical Critique of the 2011 USGS Report

Prepared for

The Advertiser Company

TECHNICAL CRITIQUE OF THE 2011 USGS REPORT ENTITLED:

"Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010"

Prepared by

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Project Number: CHR8371

13 June 2012

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LIST OF ACRONYMS

ATSDR	Agency for Toxic Substances and Disease Registry
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
Cl^-	Chloride Ion
CCP	Capitol City Plume
CFC	Chlorofluorocarbons
CSM	Conceptual Site Model
COI	Constituents of Interest
DCE	Cis-1,2-Dichloroethene
EMC	Environmental Materials Consultants
EQL	Estimated Quantitation Limit
fmol/L	Femtomoles per Liter
FOIA	Freedom of Information Act
GC	Gas Chromatograph
GIS	Geographic Information Systems
MCL	Maximum Contaminant Level
mol/L	Moles per Liter
MRL	Method Reporting Level
MSDS	Material Safety Data Sheet
MWWSSB	Montgomery Water Works and Sanitary Sewer Board
Na^+	Sodium Ion
NaCl	Sodium Chloride
NAPL	Non-Aqueous Phase Liquid
NO_3^-	Nitrate

LIST OF ACRONYMS continued

O_2	Oxygen
PCE	Tetrachloroethene
ppbv	Parts per Billion by Volume
ppm	Parts per Million
RI	Remedial Investigation
RSA	Retirement Systems of Alabama
SDWA	Safe Drinking Water Act
SF_6	Sulfur Hexafluoride
TCE	Trichloroethene
TMB	Trimethylbenzene
TTHM	Total Trihalomethane
µg/L	Micrograms per Liter
µg/kg	Micrograms per Kilogram
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound

1 INTRODUCTION

Geosyntec Consultants (Geosyntec) was retained by The Advertiser Company to prepare a technical review of the United States Geologic Survey's (USGS) document entitled "Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010" (Landmeyer *et al.*, 2011). Geosyntec concludes that the USGS report contains a number of discrepancies, inconsistencies, and inaccuracies that render the report's findings speculative and unreliable, and in many cases, implausible.

The USGS report documents three types of environmental assessments, which were conducted at the Capitol City Plume (CCP) Site:

1. pore water collected in 2008 from the hyporheic zone of a creek using passive-diffusion bag samplers;
2. tissue samples in 2008 and 2009 from trees growing in downtown Montgomery in areas allegedly impacted by groundwater contamination and from trees growing in the riparian zone along the Alabama River and Cypress Creek; and
3. groundwater samples collected during April and May 2009 and during May 2010.

Based on this data, as well as information concerning sulfur hexafluoride (SF_6), chlorofluorocarbons, pH measurements and chloroform concentrations in groundwater for purposes of attempting to date the releases, the USGS report develops a number of theories for the CCP Site, including probable source areas, release mechanisms, and transport pathways.

In order to provide a proper and sound foundation for analysis, a comprehensive Conceptual Site Model (CSM), based on a geographical information systems (GIS) database, was developed by Geosyntec to evaluate the CCP Site. All publically available data known to Geosyntec was included in the GIS database; no independent sampling was conducted by Geosyntec. The CSM incorporates physical information, including stratigraphy, hydrology, and infrastructure information; chemistry data, including analytical results for the characterization of constituents of interest (COI) as well as geochemical parameters; and receptor information, e.g., extraction well data and potential receptors for vapor intrusion. The result of this effort indicates that the CCP Site includes sub-plumes of several COIs, including chlorinated solvents; benzene, toluene, ethylbenzene, and xylenes (BTEX); and related parameters present in groundwater in downtown Montgomery, Alabama. The contamination at the CCP Site is complex and indicates varying chemical signatures and contribution by numerous sources.

Geosyntec conducted a source identification study, based on the areas of the highest contaminant concentrations in soil and groundwater. Geosyntec worked with FTI Consulting (FTI) to identify current and historical operations that may have caused releases in these areas. Geosyntec evaluated information from the following pertinent CCP Site documents:

- United States Environmental Protection Agency (U.S. EPA) Freedom of Information Act (FOIA) documents, including 104(e) responses
- Alabama Open Records Act documents
- FTI findings
- Summaries of previous investigations
- Technical and trade literature
- City of Montgomery sewer drawings
- Groundwater sampling data
- U.S. EPA and Alabama Department of Environmental Management (ADEM) guidance documents

Over 100 present-day and historical businesses with a potential nexus to the CCP Site have been identified. Some potential sources located in the immediate vicinity of the Retirement Systems of Alabama (RSA) Chiller Plant, where the highest concentrations of tetrachloroethene (PCE) have been observed in both soil and groundwater, are potentially significant, based upon the findings of regulatory inspections. The USGS has advanced a hypothesis of probable source history, which entails the introduction of COIs into a sewer system at 200 Washington Avenue, which henceforth conveyed the COIs to the subsurface at the RSA Chiller Plant. Multiple lines of evidence, associated with chemical use history, fate and transport mechanisms, plume composition and morphology, and available source characterization data, demonstrate that the 200 Washington Avenue location could not have been a source of contamination as hypothesized in the USGS report. Instead, the data support a CSM wherein the contamination has arisen from the introduction of COIs to the subsurface by numerous sources, of which the most significant are in the immediate vicinity of the RSA Chiller Plant.

The purpose of this report is to provide a technical critique of the information presented in the USGS report. Section 2 discusses limitations of phytoforensics for source identification. Section 3 presents USGS CSM discrepancies and inconsistencies. Summary and conclusions are included in Section 4. Section 5 includes references.

2 LIMITATIONS OF PHYTOFORENSICS FOR SOURCE IDENTIFICATION

The USGS conducted a tree core survey, sometimes also referred to as phytoscreening or phytoforensics, at the CCP Site in an attempt to assess the distribution of subsurface contamination through the interaction of the tree roots with soil gas, soil moisture, and groundwater. The discussion which follows focuses on the limitations of phytoscreening both as applied to environmental investigations involving contaminated groundwater in general as well as to the specific USGS study at the CCP Site.

2.1 General Limitations

Regardless of the site, the use of phytoforensics is best considered as a screening-level tool to help identify areas which may warrant further investigation utilizing more precise and detailed analytical methods. This section presents a discussion of the general limitations in the use of tree core sampling in attempting to delineate and further define subsurface contamination.

Phytoscreening analysis does not provide pin-point identification of sources or accurate quantification of groundwater concentrations. This is, in part, due to the heterogeneities in urban subsurface environments and the inherent biological variability of trees of various species and tree ages. Many urban areas have undergone years of development in which the subsurface conditions have been modified and manipulated for a variety of purposes, including the installation of utilities, excavation and filling for grading purposes, and the construction and demolition of structures with subsurface features such as basements and deep foundations. These modifications to the subsurface environment can cause a significant amount of both lateral and vertical heterogeneity in the shallow geology of an urban setting.

Research has also indicated that the relationship of phytoscreening results can have a much more significant correlation to the near-surface soil and soil vapor concentrations than it does to concentrations in the deeper groundwater. Additionally, trees can be geologically isolated from the deeper contaminants by impermeable layers above the groundwater table. Because of the nature of phytoscreening, in which the tree tissue, and hence the tree core samples, serve as an integrator of the contaminant mass from all media, conclusions regarding the source of the contaminants typically should not be made. The analysis of tree cores does not discriminate between atmospheric, soil, soil vapor or groundwater origins of contamination.

2.2 Site-Specific Limitations

As discussed in the previous section, the depth to groundwater can play a significant role in the correlation of contaminants found in the tree core and the concentrations detected in the groundwater. At the CCP Site, the depth to groundwater (30 to almost 60 feet below ground surface [bgs]) presumably limits the potential for tree coring and phytoscreening to mimic groundwater concentrations. Given these depths to groundwater, positive detections in the

tree cores may relate to vadose zone contaminants, which may emanate from localized releases and not necessarily from the groundwater directly beneath the tree.

While tree core analysis can be used for screening and delineation, the methods utilized for this study were not the most sensitive or reproducible available. In particular, the portable gas chromatograph (GC) is not as sensitive or reproducible as other laboratory-based analysis. Additionally, the sample preparation methods used by USGS included microwave heating of selected cores in a hotel room, wherein the variability in tissue mass and tree type could lead to different heating (final temperature) of individual samples, thereby establishing different partitioning of the contaminants in the core-water-vapor among the samples. In particular, the microwave duration was not consistent for all samples, which could impact the level of contaminant observed in the analysis of the headspace.

In reviewing the data generated by the USGS tree core survey, considerable variability was noted in the phytoscreening data. In particular, variability was observed in analysis of trees T61 and T64 as repeat analysis of the cores resulted in much lower trichloroethene (TCE) (68,650 versus 4,657 parts per billion by volume [ppbv] in Tree 64) tree core headspace concentrations or non-detects (176 ppbv vs. non-detect in Tree 61). A consistent level of >60,000 ppbv in a core sample, such as that reported by the USGS in a sample from Tree 64, would require a source of significant concentration, likely near the chemical activity of pure non-aqueous phase liquid (NAPL) TCE, within the root zone of the tree. This appears implausible because the high concentrations noted in Tree 64 were not confirmed with repeat samples or observation of similarly high concentrations of TCE in the surrounding media. The short term analytic variability of more than an order of magnitude raises concern about the confidence in contaminant quantification in these trees during this round of analysis.

The use of chloride ion (Cl^-) concentrations in tree tissue as an indicator of contaminant source is limited in application at the CCP Site for a variety of reasons. The USGS report implies that the chloride ion concentrations found in the tree core samples are derived from chlorinated compound contaminants in the subsurface environment in the vicinity of the tree from which the tree tissue was collected. This implication is problematic for a variety of reasons as highlighted in the following paragraphs.

The USGS report suggests that elevated chloride in tree samples is evidence of reductive dechlorination occurring (p. 37 of Landmeyer *et al.,* 2011). However, dechlorination of TCE and PCE is not thought to be ongoing in the subsurface environment at the CCP Site. The highly oxidized, aerobic conditions at the CCP Site do not support the dechlorination and release of Cl- ions from chlorinated compounds in the soil or groundwater.

Also, based on the data presented, the highest concentrations of Cl^- in the tree tissue were not related to the highest chlorinated solvent locations in the groundwater. The highest Cl^- concentration was measured at Tree 23, which is located outside both the plume and sewer lines. It should also be noted that the potential source of Cl^- ions in the tree core samples is

not strictly limited to the dechlorination of chlorinated solvents. Also, the mobility of Cl^- ions in tree tissue is limited, and it can impact multiple years in the dendrology of the trees.

From a statistical sample design standpoint, there also were not enough samples collected from outside the suspected plume area to adequately establish a clear background Cl^- concentration in trees from the area. In the discussion of the relationship of Cl^- to sodium ion (Na^+) concentrations, it is unclear how the USGS developed their theories in the report (Landmeyer *et al*., 2011), as the relationship of Cl^- and Na^+ is apparently made in terms of mass, not molar concentration. On a mass basis the ratio should be roughly 1.5, which is in line with the 35:23 molecular weights. The potential source of sodium chloride (NaCl) was also not noted to establish this potential background source of Cl^-.

With respect to the potential dating of release events at the CCP Site, dendrochemistry analysis provides little insight, and the limited number of analysis and statistical data are not adequate for a full conclusion regarding the date of a specific release.

In terms of the correlation of groundwater concentrations to tree core sample concentrations, phytoscreening at the CCP Site revealed TCE and PCE contamination in multiple locations, but the relative concentrations in the groundwater and tree cores were not shown to correlate.

Contaminants were not consistently detected across the CCP Site or in any clearly indicative pattern. TCE and PCE did not show consistent spatial distribution for the two compounds, and aerobic conditions and high redox potential in the groundwater, along with prevalence of electron acceptors (oxygen [O_2] and nitrate [NO_3^-]) strongly suggest that TCE was not produced from the reductive dechlorination of PCE. Therefore, the tree coring data does not support the hypothesis of a single source area for both TCE and PCE.

The investigation does not support the hypothesis of a PCE source in the 200 Washington Avenue area, as the lack of PCE concentration in groundwater or tree core samples in the 200 Washington Avenue vicinity questions the tie to high groundwater concentrations and soil vapors in the area of the RSA Chiller Plant. No sampling was carried out upgradient of Washington Avenue, which limits the clear definition of a source, in this area specifically.

2.2.1 USGS's Dendrochemistry Results are Inconclusive

In August 2008, USGS collected cores from 69 landscape trees in and around Montgomery (Landmeyer *et al*., 2011). Page 16 of the USGS report states, "Of the 69 trees cored, TCE was the most frequently detected compound above the [method reporting level (MRL)] and was detected in 24 trees (34 percent). PCE was the next most frequently detected compound above the MRL and was detected in 7 trees (10 percent)...Both PCE and TCE were detected in 5 trees....The petroleum hydrocarbons benzene and toluene were detected above the MRL in only trees T53 and T54" (Landmeyer *et al*., 2011).

Figure 2-1 presents the locations of trees core samples collected by USGS during August 2008. The maximum tree headspace TCE concentration of 68,650 ppbv was measured at Tree 64. A duplicate sample from Tree 64 had a TCE concentration of 4,657 ppbv (Landmeyer *et al*., 2011). TCE was also detected at Tree 61, located to the east of Tree 64, at a concentration of 176 ppbv, with a duplicate result of <20 ppbv (Landmeyer *et al*., 2011). The lack of agreement between the field duplicates for tree headspace analysis of TCE at Tree 64 and Tree 61 indicates issues with analytical reproducibility and/or sampling techniques. The concentrations of PCE, TCE, or cis-1,2-dichloroethene (DCE) in the area directly north of Tree 64 and south of Dexter Avenue (see **Figure 2-1**) indicates the absence of a connection between any concentrations at Tree 64 and concentrations in the vicinity of the RSA Chiller Plant or elsewhere at the CCP Site. At most, the detection of TCE in Tree 64 indicates a localized presence that was not widespread in trees located only a few meters away.

PCE was detected only downgradient and sidegradient of Tree 64 at Trees T2, T5, T12, T31, T32, T38 and T39 (see **Figure 2-1**). The maximum PCE tree headspace concentration of 8,782 ppbv was measured at Tree 32 in the vicinity of the RSA Chiller Plant at the CCP Site (Landmeyer *et al*., 2011). Both PCE and TCE were detected at Trees T31 and T32 in the vicinity of the RSA Chiller Plant; Tree 12 (downgradient of the RSA Chiller Plant); and Trees T2 and T5 (near the Alabama River) (Landmeyer *et al*., 2011).

Benzene and toluene were not detected in the vicinity of the former The Advertiser Company buildings and Tree 64, and concentrations of ethylbenzene and xylenes were not detected in any tree headspace samples (Landmeyer *et al*., 2011).

The USGS report asserts that based on the considerable vadose zone thickness of 56 feet (i.e., much deeper than oak tree root penetration), the detection of TCE in the headspace of Tree 64 "indicates a source of TCE in the unsaturated zone at this location" (p. 16 of Landmeyer *et al*., 2011). "Unsaturated zone source" has multiple meanings; the USGS report implies that TCE was introduced into the subsurface as an industrial waste in this location. However, the USGS report fails to rule out a different source of TCE to the tree headspace, that of either (i) off-gassing of TCE from the groundwater table into the soil gas; or (ii) lateral soil gas migration to the location from elsewhere. TCE in these instances could have been introduced into the groundwater from a range of upgradient sources or the vadose zone from nearby sources in any direction. USGS's discussion of the tree core sampling method fails to adequately describe the specific implications of its findings (e.g., do detections indicate a NAPL source, or could they indicate a broader, dissolved-phase plume in groundwater?).

In conclusion, tree headspace measurements for TCE and BTEX do not support USGS's theory regarding sanitary sewer leakage in the vicinity of the former The Advertiser Company buildings and Tree 64 as the source of: (1) TCE and BTEX in the vicinity of Tree 64 and; (2) TCE and BTEX plumes to the north and west.

2.2.2 Soil Concentrations in the Vicinity of Tree 64 are not Indicative of a Source

Page 39 of the USGS report states, "The detection during August 2008 of TCE in core samples from trees growing along Washington Avenue indicates a near-surface residual source of TCE in that immediate area" (Landmeyer et al., 2011). Although not based on the USGS report, U.S. EPA has also communicated a view that 200 Washington Avenue and 115-116 South McDonough Street (the former The Advertiser Company buildings) and Tree 64 are also a source area for BTEX compounds.

Geosyntec's review of pertinent CCP Site documents and historical soil and groundwater analytical results indicates that the concentrations of BTEX, TCE, and other volatile organic compounds (VOC) are not indicative of source area concentrations. Soil sampling locations in the CCP Site are shown on **Figure 2-2** and are described in CH2M Hill, Inc. (CH2M Hill), 1999; Black & Veatch Special Projects Corp (Black & Veatch), 2002; and Environmental Materials Consultants (EMC), 2003. Soil analytical results for all constituents with one or more detections in the vicinity of Tree 64 are presented in **Table 2-1**. Soil concentrations of BTEX and TCE in the vicinity of the former The Advertiser Company buildings and Tree 64 were below their respective analytical detection limits, with the exception of relatively low detections of BTEX and TCE at soil borings CH2-SB-16, CH2-SB-17, and CH2-SB-18. The detections of BTEX, TCE, and other VOCs reported by CH2M Hill at CH2-SB-16, CH2-SB-17, and CH2-SB-18 (CH2M Hill, 1999) are below the estimated quantitation limit (EQL) of 5 micrograms per kilogram (µg/kg) in U.S. EPA SW846 Method 8260B, with the exception concentrations of ethylbenzene, toluene, and xylenes in one sample collected from 20 to 22 feet bgs at CH2-SB-18 (See **Table 2-1**). The low detections (below EQL) of soil BTEX and TCE concentrations reported by CH2M Hill are outside the analytical method acceptance criteria for precision and accuracy. Soil concentrations of BTEX compounds at CH2-SB-18 (20 to 22 feet bgs), although above the method EQL, are relatively low and do not indicate a source area for concentrations of BTEX detected to the north and west in the CCP Site.

In conclusion, the soil TCE and BTEX concentrations do not indicate the presence of a source area at the former The Advertiser Company buildings and Tree 64.

2.2.3 Groundwater Concentrations in the Vicinity of Tree 64 are not Indicative of a Source

Figure 2-3 presents groundwater sampling locations in the CCP Site, which are described in CH2M Hill, 1999; Black & Veatch, 2002; EMC, 2003; and J. M. Hall, 2007. **Table 2-2** summarizes the historical groundwater analytical results for all constituents with one or more detected concentration at locations in the vicinity of the former The Advertiser Company buildings and Tree 64. The groundwater contaminant concentrations do not indicate the presence of a source area that could have impacted areas to the north and west with BTEX or TCE.

Figure 2-4 presents the most recent groundwater concentrations of BTEX available at each sampling location in the CCP Site. Higher concentrations of BTEX have been detected in groundwater at downgradient and sidegradient locations, including approximately 3 times higher at CH2-SB-9; 9 times higher at CH2-SB-5; more than 10 times higher at TW-05, CH2-SB-14, and TW-11; more than 100 times higher at CH2-SB-15; and more than 1,000 times higher at TW-09 (see **Table 2-2** and **Figure 2-4**). Concentrations of BTEX more than 10 times higher have also been detected at upgradient and sidegradient location MW-11S (see **Table 2-2** and **Figure 2-4**). In addition, the relative concentrations of benzene, toluene, ethylbenzene, and xylenes were not consistent among locations with high total BTEX, indicating that multiple sources of BTEX compounds are present in the CCP Site.

Groundwater BTEX concentrations in the vicinity of the former The Advertiser Company buildings and Tree 64 were below the analytical detection limit, with the exception of concentrations of xylenes at CH2-SB-16, CH2-SB-17, and CH2-SB-18 in February 1999 (see **Table 2-2**). The concentrations of xylenes detected at CH2-SB-16 (1.27 micrograms per liter [µg/L]), CH2-SB-17 (2.6 µg/L), and CH2-SB-18 (2.02 µg/L) were significantly lower than the Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) of 10,000 µg/L for xylenes (see **Table 2-2**). In addition, concentrations of xylenes were higher at downgradient and sidegradient locations such as TW-05 and CH2-SB-9, CH2-SB-5, CH2-SB-14 and CH2-SB-15, TW-09, and TW-11 (see **Figure 2-3**). Higher concentrations of xylenes have also been detected in groundwater at upgradient and sidegradient location MW-11S (see **Table 2-2** and **Figure 2-3**). The xylene concentrations detected in the vicinity of Tree 64 do not represent source-area concentrations and could not have impacted areas to the north and west.

Likewise, historical groundwater analytical results for the CCP Site do not indicate that sources of TCE are located in the vicinity of Tree 64 or the former The Advertiser Company buildings. All concentrations of TCE in groundwater in the vicinity of the former The Advertiser Company buildings were below the SDWA MCL of 5 µg/L, with the exception of one detection of TCE at CH2-SB-18 (8.7 µg/L). Historical groundwater concentrations of TCE at CH2-SB-16 (3.16 µg/L), CH2-SB-17 (<1 µg/L), and MW-9S (ranging from 0.03E µg/L to 3.5 µg/L) are lower than the concentration of TCE at CH2-SB-18 (8.7 µg/L) (see **Table 2-2**). CH2-SB-16, CH2-SB-17, and MW-9S are located upgradient or sidegradient of CH2-SB-18 (see **Figure 2-3**), indicating that the vicinity of the former The Advertiser Company buildings and Tree 64 is not the source area for concentrations of TCE detected at CH2-SB-18.

Figure 2-5 presents the most recent concentrations of TCE in the CCP Site. Historical groundwater results for the CCP Site indicate that higher concentrations of TCE have been detected at MW-4S (10 µg/L in 2000; 10 µg/L in 2001;11 µg/L in 2007; and 9.62 µg/L in 2009), located downgradient to the northeast of the intersection of Perry Street and Monroe Avenue, and at MW-3S (18J µg/L in 2000 and 13 µg/L in 2001), located north of Madison

Avenue and sidegradient of the former The Advertiser Company buildings (see **Table 2-2**). Therefore, the groundwater concentrations of TCE detected in the vicinity of the former The Advertiser Company buildings and Tree 64 do not represent a source area and could not have impacted areas to the north and west.

3 USGS CSM DISCREPANCIES AND INCONSISTENCIES

A number of general observations have been made concerning the overall focus and technical approach utilized in the USGS report to assess the data and develop a CSM for the CCP Site. These observations are presented in the following sections.

3.1 USGS Incorrectly Identifies The Advertiser Company as a Source of Contamination at the CCP Site

The USGS report asserts that the primary source of PCE and TCE contamination at the CCP Site plume is a leaky sewer and (or) stormwater pipe emanating from The Advertiser Company's former printing operations at 200 Washington Avenue (see p. 40 of Landmeyer *et al.*, 2011). However, there is no knowledge of or documentation of material use of PCE or TCE by The Advertiser Company at 200 Washington Avenue. **Figure 3-1** shows PCE concentrations measured in multiple media in the vicinity of 200 Washington Avenue. Additionally, there is no evidence of PCE or TCE contamination in the vicinity of the former The Advertiser Company property. Material safety data sheets (MSDS) for "Freedom Wash" and UC-50 blanket roller wash solutions used by The Advertiser Company are included in **Appendix A**. The MSDS indicate that these solutions do not contain chlorinated solvents.

3.2 USGS Fails To Identify Likely Sources of Contamination or Acknowledge the Existence of Multiple, Distinct Sources of Contamination

The morphology of the CCP Site is too complex to be explained as caused by a single source of contamination. **Figure 3-2** shows the distribution of PCE in groundwater over time. The highest concentrations of PCE have been found at MW-12S and MW-4S, which are located at either end of an unusual, "T"-shaped plume. The most likely conclusion is that there are multiple sources of contamination and multiple contamination plumes. But USGS did not attempt to locate the most likely sources of contamination at the CCP Site which are dry cleaners and other commercial and industrial facilities in the vicinity of the RSA Chiller Plant.

USGS states on p. 17 that "dry cleaning was not performed at the CCP site" (Landmeyer *et al.*, 2011). This statement is not correct. The 1995 ADEM Preliminary Assessment provided a list of 36 historical dry cleaning operations in the CCP Site. Also, U.S. EPA's Remedial Project Manager for the CCP Site in 1999 identified dry cleaners as the most likely source of PCE, and gas stations as the most likely source of BTEX. The data appears to support this conclusion.

Additionally, the USGS report asserts on p. 17 that the Washington Avenue and Dexter Avenue printing operations "represent the only identified potential upgradient sources" of solvents (Landmeyer *et al.*, 2011). Yet, FTI's research has revealed that two dry cleaning operations and one reprographics business are located south of Washington Avenue. **Figure 3-3** shows locations of dry cleaning operations in the vicinity of the CCP Site (see FTI locations 11, 24, and 25).

Finally, the USGS report fails to discuss the data collected in the vicinity of the RSA Chiller Plant from multiple media that provide a strong indication of the presence of a localized source in this area. **Figure 3-4** shows concentrations of PCE collected from multiple media in the vicinity of the RSA Chiller Plant that indicate the likely presence of a significant PCE source in that vicinity. The PCE concentrations detected in soil and soil gas are high enough to point to a significant source to groundwater in the vicinity of the RSA Chiller Plant. Additionally, the declining PCE concentrations with distance detected in multiple media substantiate this conclusion.

Figure 3-5 shows the PCE, TCE, BTEX, trimethylbenzenes (TMB) and chloroform plumes at the CCP Site. **Figure 3-5** indicates there is no discernible broad plume and that the TCE plumes are not co-located with PCE plumes, indicating multiple unrelated source areas. The BTEX plumes are co-located with TMB plumes, which is indicative of gasoline release source areas. The BTEX plumes are not co-located with PCE plumes. The chloroform detections are also localized, indicating multiple chloroform plumes that are not co-located with PCE plumes. Comparison of plume distributions for multiple parameters reveals disparate inferred sources.

The USGS report shows an unusual temporal trend of PCE in public well 9W (see Figure 21 of Landmeyer *et al*., 2011). After a PCE detection of 60 µg/L in 1997, the PCE concentration dropped significantly after the well was taken out of service in 1994 and then remained stable, for approximately 5 years. Beginning in 2002, however, the PCE concentration rose again to a concentration of 160 µg/L in 2009. No explanation for this trend is provided in the USGS report. The atypical concentration trend observed for PCE at public supply well 9W suggests that a complex array of sources is responsible for the PCE contamination, as opposed to a single source (i.e., 200 Washington Avenue) located at a considerable distance from the public supply well.

Figure 3-6 shows the distribution of parent solvents with distance at the CCP Site. The composition of the CCP Site plume is too variable to be explained by one source. The chemical fingerprints (parameter fractions) are not consistent across the extent of the CCP Site, suggesting that multiple sources of contamination are present.

3.3 USGS's Evaluation of Certain Solvents is Flawed

The USGS report highlights the maximum observed TCE value in tree core headspace at Tree 64, located across the street from the former The Advertiser Company property (p. 16 of Landmeyer *et al.*, 2011). **Figure 3-7** shows concentrations of TCE in multiple media, including tree core headspace, groundwater, and soil gas, at the CCP Site. The USGS report fails to note potential weaknesses in the sampling methods used by USGS to evaluate the tree cores, a disparity of over an order of magnitude between samples from Tree 64, and the absence of corroborating soil, soil gas, and groundwater data to support the theory of a large volume of TCE in this location. The USGS report also fails to properly contextualize the

discovery of TCE in this tree. TCE is a relatively minor component of the CCP Site. PCE is far more significant, both from the standpoint of concentration magnitude and carcinogenic risk profile. **Figure 3-8** compares TCE and PCE isopleths in groundwater and shows the relative insignificance of TCE compared to PCE at the CCP Site.

In addition, as mentioned above, due to the aerobic groundwater conditions documented in the USGS report and elsewhere, it is unlikely that the observed TCE is the result of PCE dechlorination, since PCE does not degrade under aerobic conditions. Hence, the elevated TCE reading in the headspace of Tree 64 is not significant compared to other potential plume source markers. The USGS report has conflated the significance of TCE with that of PCE to exaggerate the potential significance of 200 Washington Avenue as a potential source of CCP Site contamination. Furthermore, there is no evidence that the TCE found in Tree 64 is from 200 Washington Avenue or that TCE allegedly found in this location has any connection to the multiple, distinct PCE and BTEX plumes found elsewhere at the CCP Site.

In conclusion, USGS is relying on one head-space core sample from Tree 64 to establish the 200 Washington Avenue property as the primary source area of the CCP Site. But USGS excluded and ignored multiple existing lines of evidence regarding the CCP Site geochemistry, hydrogeology, and other potential source areas that are inconsistent with their conclusions.

3.4 **Presentation and Discussion of Specific Datasets is Overly Selective**

The USGS report discusses select historical information that best support the USGS positions without a presentation of data and observations that contradict their assertions. USGS relies to a substantial degree upon tree core headspace data as a screening-level indication of solvent presence. The maximum observed TCE value in tree cores near 200 Washington Avenue is used to build the case for a source that is upgradient of the RSA Chiller Plant property. However, the USGS report ignores other, more commonly used, data sources available for screening-level source identification, such as the Petrex soil gas data survey performed in 1994. **Figure 3-9** shows the 1994 Petrex soil gas data and a clear signature of high concentrations near the RSA Chiller Plant property surrounded by sampling points that decline in concentration with distance from the RSA Chiller Plant. This survey indicated a clearly dominant source zone for PCE in the vicinity of the RSA Chiller Plant with decreasing concentrations moving outward in all directions, including to the south (towards Washington Avenue).

Similarly, the USGS report (p. 16 of Landmeyer *et al.*, 2011) refers to field screening data during well installation of MW-9S, which was reported in the CCP Site Remedial Investigation (RI) Report prepared for the U.S. EPA (Black & Veatch, 2002), to implicate the 200 Washington Avenue location, noting the elevated readings (10 to 300 parts per million [ppm]) observed during drilling. Yet, the USGS report fails to note the low to non-detect values observed in soil and groundwater analytical samples collected in the same location.

Figure 3-10 summarizes concentrations of PCE in soil and groundwater at the CCP Site for the timeframe of the Black & Veatch RI (1999-2003).

The inconsistent results (positive field screening readings with low to negative soil and groundwater results) suggest that the field screening results may be inaccurate or stem from lateral soil gas migration to the location from elsewhere. Later in the discussion (p. 17 of Landmeyer *et al.*, 2011), the USGS report downplays the significance of field screening results in other potential source areas, noting that results near the RSA Chiller Plant (i.e., MW-1S) did not exceed 100 ppm while those in the farther downgradient MW-8S did not exceed 300 ppm. Based simply upon a comparison of screening instrument result magnitudes, the USGS assertion that the vadose zone source on Washington Avenue is more significant than those of other potential sources is baseless.

3.5 USGS's CSM is Speculative and Implausible

USGS developed a speculative CSM of a unique contaminant transport mechanism, involving sewer lines, with no direct evidence of the completeness of this pathway. The USGS introduces the sewer line conduit scenario by presenting and discussing the sewer line network and associated gradients (see Figure 18 on p. 30 of Landmeyer *et al.*, 2011). The USGS report (see Figure 18 on p. 30 of Landmeyer *et al.*, 2011) presents a subset of the sewer network, with lines shown running north from Washington Avenue to Dexter Avenue at steep gradients. However, the USGS sewer network (see Figure 18 on p. 30 of Landmeyer *et al.*, 2011) does not show the sewer network north of Dexter Avenue. An excerpt from the sanitary sewer network maps provided by the Montgomery Water Works and Sanitary Sewer Board (MWWSSB) in its 2009 correspondence with U.S. EPA Region 4 clearly indicates distinct northern and southern sewer lines along the relatively wide Dexter Avenue, which run parallel to Washington Avenue between 200 Washington Avenue and the RSA property (see **Figure 3-11**). Hence, there is no known evidence of a sewer conduit that connects 200 Washington Avenue and the RSA Chiller Plant.

There is also no evidence of a stormwater sewer connection between 200 Washington Avenue and the RSA Chiller Plant property. A review of the city street grid in relation to the city topography shows that there is no pathway that would lead from 200 Washington Avenue to the RSA Chiller Plant. As confirmed by the City, there are no sewer or groundwater pumps in this area and stormwater would have to do the impossible, flow uphill against gravity, in order to validate USGS's theory.

Page 40 of the USGS report indicates that the sanitary sewers provide the probable contamination pathway (Landmeyer *et al.*, 2011). In July 1999, CH2M Hill collected sewer water samples from sewer manholes in the CCP Site as part of the Downtown Montgomery Sewer Study prepared for MWWSSB (CH2M Hill, 1999). The CH2M Hill sewer samples provided information on the contaminants in the Montgomery sewer system at that time. Several manholes located in the vicinity of Tree 64 were sampled during the July 1999 study

(see **Figure 3-11**). Sewer manhole analytical results for all constituents with one or more detections reported by CH2M Hill (1999) are presented in **Table 3-1**. There were no detectable concentrations of BTEX or TCE in manholes 5233, 5240, and 5231 located in the vicinity of Tree 64, with two exceptions: toluene (12.2 µg/L) at manhole 5231 and TCE (1.36 µg/L and 1.52 µg/L) at manhole 5240 (see **Table 3-1**). However, all detections of BTEX and TCE in the sanitary sewer manholes 5233, 5240, and 5231 are below the respective SDWA MCLs (see **Table 3-1**).

The USGS report presents methods of forensic analysis (groundwater flow velocities and travel times) that omit fundamental factors in transport velocity calculations. The discussion of groundwater travel velocities (see p. 35 of Landmeyer *et al.*, 2011) compares the apparent migration rates of peak solvent concentrations in groundwater to estimated groundwater flow rates. Rates of 95 to 131 feet/year are discussed; however, the analysis fails to consider retardation factors. For a relatively non-polar solvent such as PCE, Geosyntec has estimated a site-specific retardation factor of 7.89, based on organic carbon and bulk density data available from the RI Report (Black & Veatch 2002). This site-specific retardation factor is significant, as it would reduce the apparent velocity of PCE to a range of 12 to 17 feet/year. Consequently, the travel time of PCE in groundwater from 200 Washington Avenue to public supply well 9W will increase by108 to 275 years.

Geosyntec used BIOCHLOR, a spreadsheet model from U.S. EPA, to model the transport of PCE-contaminated groundwater in the shallow aquifer underlying downtown Montgomery. Hydraulic conductivity, fraction of organic carbon, hydraulic gradient, and PCE concentration data from a variety of historical sources (e.g., Black & Veatch, 2002) were used as inputs to the model. **Figure 3-12** shows groundwater flow direction and travel time estimations under different scenarios: (i) USGS assumptions and distance, (ii) Geosyntec assumptions for groundwater travel from 200 Washington Avenue to public supply well 9W, and (iii) Geosyntec assumptions for groundwater travel from the RSA Chiller Plant to public supply well 9W. The model output indicated that PCE would travel in the groundwater at a flow rate ranging from 11 to 23 feet/year. This translates to an estimated travel time of 143 to 300 years from 200 Washington Avenue to public supply well 9W (a distance of 3,300 feet). This travel time is significantly greater than the travel time reported by USGS of 25 to 35 years. Hence, it is not plausible that any impacts to groundwater at 200 Washington Avenue could have impacted public supply well 9W.

3.6 **USGS's Interpretation of the Site Geochemistry is Implausible**

USGS employed a suite of geochemically-based lines of evidence that are inconsistent with the readily apparent CSM of the basic flow system. The USGS builds a case for the sewer line conduit scenario by evaluating a series of geochemical markers. Overall, the USGS report aims to show that the contamination observed near or downgradient of the RSA Chiller Plant is associated with significant influxes of treated municipal water, thereby supporting the

case for contaminant transport via sewer lines. Chloroform and pH, two informative geochemical markers, are discussed in detail below.

3.6.1 Chloroform

Chloroform was observed in several wells in the CCP. Page 40 of the USGS report states, "The detection of chloroform in groundwater from well MW-1S during 2009 at concentrations indicative of treated municipal water indicates the following potential contaminant pathway: PCE- and TCE-contaminated wastewater related to printing operations was released to sinks, sumps, and floor drains in buildings along Washington and Dexter Avenues. This wastewater entered the sanitary sewer and (or) stormwater systems, entered the deeper subsurface through leaks and (or) joints, and was transported through the thick unsaturated zone downgradient to an area near the groundwater table at well MW-1S and where workers were exposed to vapors in 1993" (Landmeyer *et al.*, 2011).

In annual drinking water quality publications dated 2005 through 2011, MWWSSB reports the following total trihalomethanes (TTHM) concentrations (of which chloroform is typically the predominant constituent): 37-42 µg/L (2005), 42 µg/L (2006), 31 µg/L (2007), 27 µg/L (2008), 33 µg/L (2009), 36 (2010), and 37 µg/L (2011) (MWWSSB, 2005 through 2011). The SDWA MCL for TTHM, is 80 µg/L for public water systems (Agency for Toxic Substances and Disease Registry [ATSDR], 1997).

The highest chloroform concentration was 37.3 µg/L in MW-1S (near the RSA Chiller Plant), compared to TTHM concentrations reported for municipal water by MWWSSB, ranging from 27 to 42 µg/L. If USGS's CSM is accurate, then the groundwater represented by MW-1S is derived entirely from sewer leakage, with no dilution in ambient groundwater. However, as discussed in the following sections the concentrations of chloroform in sanitary sewer samples are significantly lower than the above-mentioned groundwater concentrations.

Table 3-1 summarizes the concentrations of chloroform in the sanitary sewer system wastewater (CH2M Hill, 1999). Sewer manhole sampling locations are shown on **Figure 3-11** along with the City of Montgomery sewer line locations and flow directions. Groundwater chloroform concentrations in the vicinity of the former The Advertiser Company buildings and Tree 64 were significantly lower than the reported concentrations of TTHM in MWWSSB finished drinking water (27 µg/L to 42 µg/L) (see **Table 2-2**).

By comparison, chloroform groundwater concentrations at locations downgradient and sidegradient of Tree 64 were significantly higher than the sewer wastewater concentrations (see **Figure 2-3 and Table 2-2**). In addition, USGS does not acknowledge the many other potential sources of chloroform to municipal sanitary sewer discharges and to groundwater. Chloroform, which has been used in the manufacture of various products, could have been released, directly or indirectly, from other sources to the groundwater.

Chloroform is released into the environment as a result of its manufacture and use; its formation during the chlorination of drinking water, municipal and industrial wastewater, and swimming pool and spa water; and from other water treatment processes involving chlorination. Historical and current industrial uses of chloroform encompass a number of products and processes including production of refrigerants, fluorocarbon plastics, resins, and propellants, dyes and pesticides, industrial solvents, fats, oils, rubber, lacquers, floor polishes, greases, gums, waxes, vitamins, and flavors, fire extinguishers, fumigants, dry cleaning spot remover, and medical anesthetics (USGS, 2006).

3.6.2 pH

The USGS report notes that the MW-1S pH value of 7.3 is indicative of treated municipal water conditions (i.e., pH in the range of 7.8 to 9.3 was reported by MWWSSB in 2010) and not ambient groundwater conditions (i.e., average pH of 5.35 in other CCP Site shallow groundwater monitoring wells). As with the chloroform results, if USGS's CSM is accurate, these values would indicate that sewer leakage would represent a significant, and possibly dominant, fraction of the groundwater composition. Also, the groundwater pH measurements indicate generally acidic conditions at the CCP Site.

Page 30 of the USGS report states, "Additional evidence of localized recharge by treated municipal water in the vicinity of well MW-1S is the measured pH of 7.3 in that well relative to the mean pH of 5.35 for the other shallow wells" (Landmeyer *et al.,* 2011).

However, the near-neutral pH measurements at MW-1S and MW-1I in May 2009 are not supported by other pH measurements at these locations. **Table 3-2** presents the historical groundwater field measurements for pH reported in the previous site investigation documents. The May 2009 measurement (pH = 7.3) at MW-1S is not consistent with other historical measurements in May 2000 (pH = 5.37) and October 2011 (pH = 5.08) (see **Table 3-2**). Likewise, the May 2009 measurement (pH = 7.7) at MW-1I was not consistent with other historical measurements in May 2000 (pH = 6.14) and October 2011 (pH = 5.66) (see **Table 3-2**). The acidic pH measurements at MW-1S and MW-1I in May 2000 and October 2011 are not consistent with typical pH measurements of treated drinking water. Therefore, USGS's assertion that the 2009 pH measurement at MW-1S of 7.3 is indicative of localized recharge by treated municipal water is baseless.

In addition, if USGS's theory was valid, the lines of evidence for select chloroform and pH data would suggest that the influx of municipal water to groundwater via leaking sewer lines would necessarily be sufficiently substantial to cause the municipal water to effectively displace the ambient groundwater. However, a review of potentiometric surfaces generated over several time periods, including the potentiometric surface presented in the USGS report (see Figure 3 of Landmeyer *et al.,* 2011), show little to no physical evidence of such displacement occurring. Given the moderate hydraulic conductivity (with a geometric mean

of 2 x 10^{-3} cm/s, based on Black & Veatch, 2002), significant groundwater mounding would be expected if such displacement were occurring, yet no such behavior is seen in the water level data.

3.7 USGS Groundwater Recharge Dating Discrepancies and Inconsistencies

Groundwater recharge dating presented by USGS is inconsistent and inconclusive. In May 2010, USGS collected groundwater samples from several wells screened in the shallow and intermediate aquifer zones and attempted to calculate the age of the groundwater using the groundwater concentrations of SF_6 and chlorofluorocarbons (CFC) including CFC-11 (trichlorofluoromethane), CFC-12, and CFC-113 (1,1,2-trichlorotrifluoroethane). Page 40 of the USGS report states, "the following potential contaminant pathway: PCE- and TCE-contaminated wastewater related to printing operations was released to sinks, sumps, and floor drains in buildings along Washington and Dexter Avenues. This wastewater entered the sanitary sewer and (or) stormwater systems, entered the deeper subsurface through leaks and (or) joints, and was transported through the thick unsaturated zone downgradient to an area near the groundwater table at well MW-1S and where workers were exposed to vapors in 1993. Moreover, this potential contamination pathway remains viable as indicated by detections of SF_6 and CFC concentrations found in groundwater" (Landmeyer *et al.*, 2011).

However, there are several discrepancies and inconsistencies between the SF_6 groundwater dating model of Busenberg and Plummer (2000) and the methods and conclusions of the USGS report (Landmeyer *et al.*, 2011). These discrepancies and inconsistencies are summarized below.

The SF_6 concentrations reported by USGS are approximately 15 orders of magnitude higher than the modern air-water equilibrium concentrations reported in the technical literature. The modern air-water SF_6 equilibrium concentration experimentally-derived and used by Landmeyer *et al.* (2011) ranged from 1.59 to 1.65 moles per liter (mol/L), compared to the modern air-water equilibrium concentrations reported by Busenberg and Plummer (2000) (1.4 to 2 femtomoles per liter [fmol/L]).

USGS reports groundwater recharge dates ranging from 1952 to 2009 (Landmeyer *et al.,* 2011), many of which are prior to the practical dating limit of 1970 reported by Busenberg and Plummer (2000). Based on the method of Busenberg and Plummer (2000), no differentiation can be made in groundwater recharge dates prior to approximately 1970. USGS reports groundwater recharge dates prior to 1970 without basis in the method of Busenberg and Plummer (2000) and without providing technical justification for these dates.

USGS does not present any information on sources of SF_6 in the local environment or demonstration of the current local atmospheric concentrations. SF_6 is a primarily anthropogenic gas that became commercially-available in 1947 with industrial production beginning in 1953 (Christophorou *et al.*, 1997; Busenberg and Plummer, 2000). The

production of SF_6 has increased over time due to the development of its various uses, and atmospheric concentrations of SF_6 have also been observed to increase over time, attributed to an apparent lack of natural sinks (Christophorou *et al*., 1997; Busenberg and Plummer, 2000). Busenberg and Plummer (2000) also demonstrated significant concentrations in certain natural sources of SF_6, including some igneous, volcanic, and sedimentary rocks and in some hydrothermal fluids. Without clear understanding of natural background concentrations of SF_6, the method of Busenberg and Plummer (2000) as used by USGS may not be valid.

Because the groundwater table is present at a depth greater than 10 meters (32.8 feet) at the majority of the groundwater sampling locations in the CCP Site (Landmeyer *et al.,* 2011), USGS would need to account for the transport of SF_6 concentrations into the deeper vadose zone. USGS does not clearly present their assumptions and calculations, so it is unclear whether they have accounted for the lag time due to the deep vadose zone.

There are also practical inconsistencies present in the interpretation of groundwater recharge dates in the CCP Site as presented by USGS (Landmeyer *et al.,* 2011). The shallow wells sampled by USGS in May 2010 are screened within approximately 10 feet of the groundwater table, with the exception of MW-7S which is screened approximately 45 feet below the groundwater table (Landmeyer *et al.,* 2011). Concentrations of SF_6 and/or CFCs present in the shallow groundwater may thus be attributed to direct equilibrium with the gas concentrations in the deep vadose zone, rather than due to a hydraulic link between the land surface (or sewer lines) and shallow groundwater as suggested by USGS. As stated above, it is also unclear whether USGS's reported groundwater age accounts for the lag in time for increasing concentrations of SF_6 in the troposphere to travel into the deep vadose zone at the CCP Site.

In a related forensic analysis, the USGS evaluated CFC data to estimate groundwater ages based on models of equilibrium partitioning involving CFCs present in the atmosphere. The USGS report (see Table 8 on p. 34 of Landmeyer *et al*., 2011) presents the data and the interpreted groundwater ages based on the CFC results. USGS indicates that concentrations of CFCs in shallow groundwater are elevated above the modern air-water equilibrium concentrations, so groundwater recharge dating was not reported for shallow monitoring wells except MW-7S. **Figure 3-13** shows the monitoring well locations where CFC concentrations accepted for interpretation by USGS and the locations that were rejected due to a determination by USGS that the wells were "contaminated by excess CFC from a non-atmospheric source" (Landmeyer *et al.*, 2011). USGS accepted fewer than half of the results for interpretation (based on sufficiently low results). The USGS CFC data are in question when the locations of the rejected wells are considered, as the rejected locations are co-located with accepted wells. Hence, it is possible that the low CFC concentrations accepted in the analysis are simply dilute expressions of the unacceptably high CFC impacts in the companion well. Therefore, USGS's selection of accepted wells appears arbitrary and without

regard to critical site-specific factors, such as high concentrations of CFCs in proximal wells and various industrial uses of CFCs.

The USGS report states, "The detection of CFCs in groundwater in wells MW-1S, MW-2S, MW-4S, MW-8S, MW-9S, MW-10S, MW12S, and MW-7I at concentrations greater than ambient atmospheric levels in equilibrium with water indicates contamination by input from local industrial sources of CFCs, including the use of CFCs as a solvent by the commercial printing industry" (Landmeyer *et al.*, 2011). However, USGS omits mention of a variety of significant potential sources of CFCs to the environment and the CCP Site such as refrigerants and dry cleaning products. For example, CFC-11 can be found in air emissions and wastewaters from industries such as refrigeration, electronics, and foam manufacturing. CFC-11 was also present in refrigeration units, air conditioners, spray paint, spray varnish, spray cosmetics, and other aerosol-propellant spray products (Oregon Department of Human Services, 1992). Also, CFC-113 was originally introduced as a dry cleaning solvent in 1964 and was used at certain dry cleaning operations until it was phased out under the Montreal Protocols. CFC-113 was also used in refrigerants, fire extinguishing agents, local anesthetics, aerosol propellants, blowing agents for foams, chemical/synthetic intermediates, heat transfer mediums, and solvents (e.g., for degreasing) (Linn, 2009). By omitting significant potential sources of CFCs at the Site, USGS presents a flawed interpretation of the groundwater concentrations of CFCs detected in the CCP Site.

4 SUMMARY AND CONCLUSIONS

Based on the information presented in this report, the following conclusions can be drawn:

- USGS incorrectly identified The Advertiser Company as a source of contamination at the Site and failed to identify the much likely sources of contamination at the CCP Site including dry-cleaners and gasoline stations.
- USGS does not properly assess the relative significance of TCE as a potential contaminant of concern at the CCP Site; PCE and BTEX are more significant sources of contamination, but were not considered by USGS in developing their source identification and contaminant transport theories.
- USGS fails to establish any connection between the possible localized discovery of TCE in Tree 64 and the multiple, distinct plumes of PCE and BTEX found elsewhere at the CCP Site
- USGS developed a speculative CSM of a unique contaminant transport mechanism via sewer lines, which is implausible because there is no direct evidence of a complete pathway. USGS's assertion that the source of the CCP Site plume is from a leaky sewer and (or) stormwater pipe emanating from The Advertiser Company's printing operations at 200 Washington Avenue is baseless. No sanitary sewer connectivity exists between sewers in the vicinity of the former The Advertiser Company buildings and Tree 64 and sewers to the north of Dexter Avenue.
- USGS presented methods of forensic analysis (groundwater flow velocities and travel times) that omit fundamental factors in transport velocity calculations. USGS used a suite of select geochemically-based lines of evidence that are inconsistent with historical data and the site CSM. USGS claims that reductive dechlorination is occurring despite little evidence to support this assertion. Aerobic conditions, high redox potential in the groundwater, and the prevalence of electron acceptors (O_2 and NO_3^-) indicate that TCE was not produced from PCE reductive dechlorination. USGS attributed the relatively high chloroform concentrations and elevated pH measurements in to municipal water recharge of the aquifer, which is not consistent with the CCP Site geochemistry data.
- Dendrochemistry results do not support USGS's theory regarding sanitary sewer leakage in the vicinity of the former The Advertiser Company buildings and Tree 64 as the source of PCE, TCE and BTEX in the vicinity of Tree 64 and the PCE, TCE and BTEX plumes to the north and west of the CCP Site. There are no detectable soil and groundwater PCE concentrations in the vicinity of Tree 64. Soil and groundwater TCE concentrations in the vicinity of Tree 64 do not indicate the presence of a source area at the former The Advertiser Company buildings and Tree 64. BTEX soil and

groundwater concentrations detected in the vicinity of Tree 64 do not represent source-area concentrations and could not have impacted areas to the north and west.

- USGS's assertion that the source of the CCP Site is from a single parent solvent source (i.e. PCE) is invalid. Tree coring does not support the hypothesis of a single source area for both TCE and PCE. Groundwater concentrations indicate a lack of closely correlated patterns of PCE and TCE contamination. PCE and TCE contaminant concentrations indicate multiple source areas. TCE plumes are not co-located with PCE plumes, indicating unrelated sources. Overall, comparison of plume distributions for multiple parameters reveals disparate inferred sources.
- USGS's groundwater recharge dating is inaccurate and inconclusive. The SF_6 concentrations reported by USGS are approximately 15 orders of magnitude higher than the modern air-water equilibrium concentrations reported in the technical literature. USGS did not address natural background concentrations of SF_6. Also, USGS reports groundwater recharge dates ranging from 1952 to 2009, many of which are prior to the practical dating limit of 1970 reported in the technical literature. Also, USGS omits mention of a variety of significant potential sources of CFCs to the environment and the CCP Site such as refrigerants and dry cleaning products and focuses on its alleged use in the printing industry.

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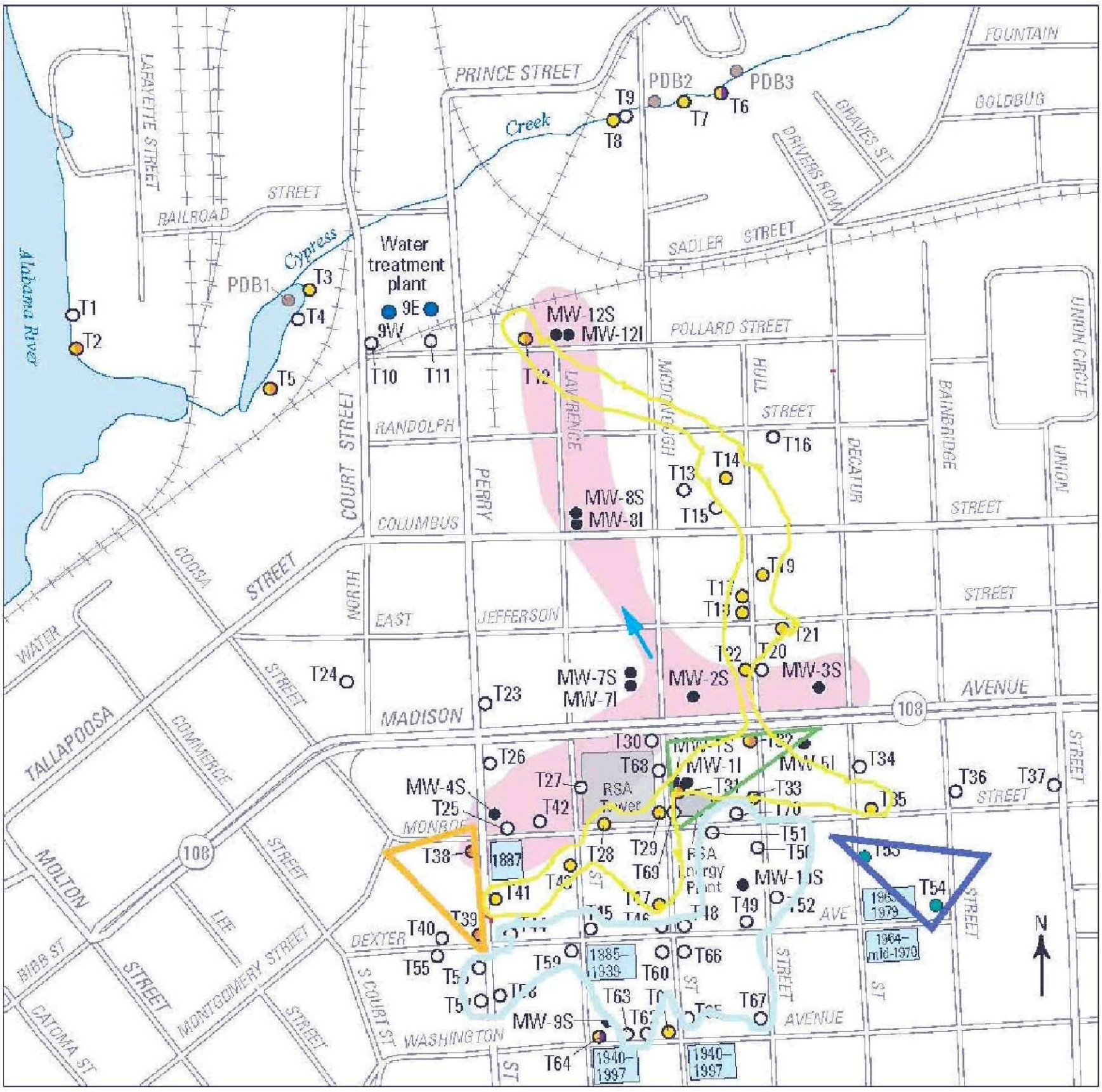
FIGURES



Base modified from Tele Atlas North America, Inc. and ESRI®, 2008, 1:100,000, Universal Transverse Mercator projection, Zone 16

EXPLANATION

PCE concentration in groundwater, July 2007—Greater than 5 micrograms per liter, estimated (modified from Hall, 2007)

1940–1997 **Former location and years occupied by commercial printing industry**

Generalized groundwater-flow direction (modified from Hall, 2007)

Well and identifier

9E Public supply

MW-7I Monitoring—S, shallow; I, intermediate

PDB1 **Passive diffusion bag (PDB) sampler and identifier**—August 2008

T24 **Tree-core identifier with no detections above method reporting levels**

Tree-core identifier with VOC detected above MRL in vial headspace containing a tree core—See table 2

- T19 Trichloroethylene (TCE)
- T39 Perchloroethylene
- T32 TCE and PCE
- T6 TCE and *cis*-1,2-dichloroethylene (*cis*-1,2-DCE)
- T53 Benzene or toluene

Figure 10. Locations of trees cored during August 2008, trees with volatile organic compound (VOC) detections above the method reporting level (MRL) in the tree-core headspace, former commercial printing industry sites, generalized direction of groundwater flow in the shallow aquifer, and delineated area of perchloroethylene (PCE) concentrations measured in groundwater during July 2007, Capital City Plume Site, Montgomery, Alabama.

Yellow outline indicates locations of trees with detections of TCE

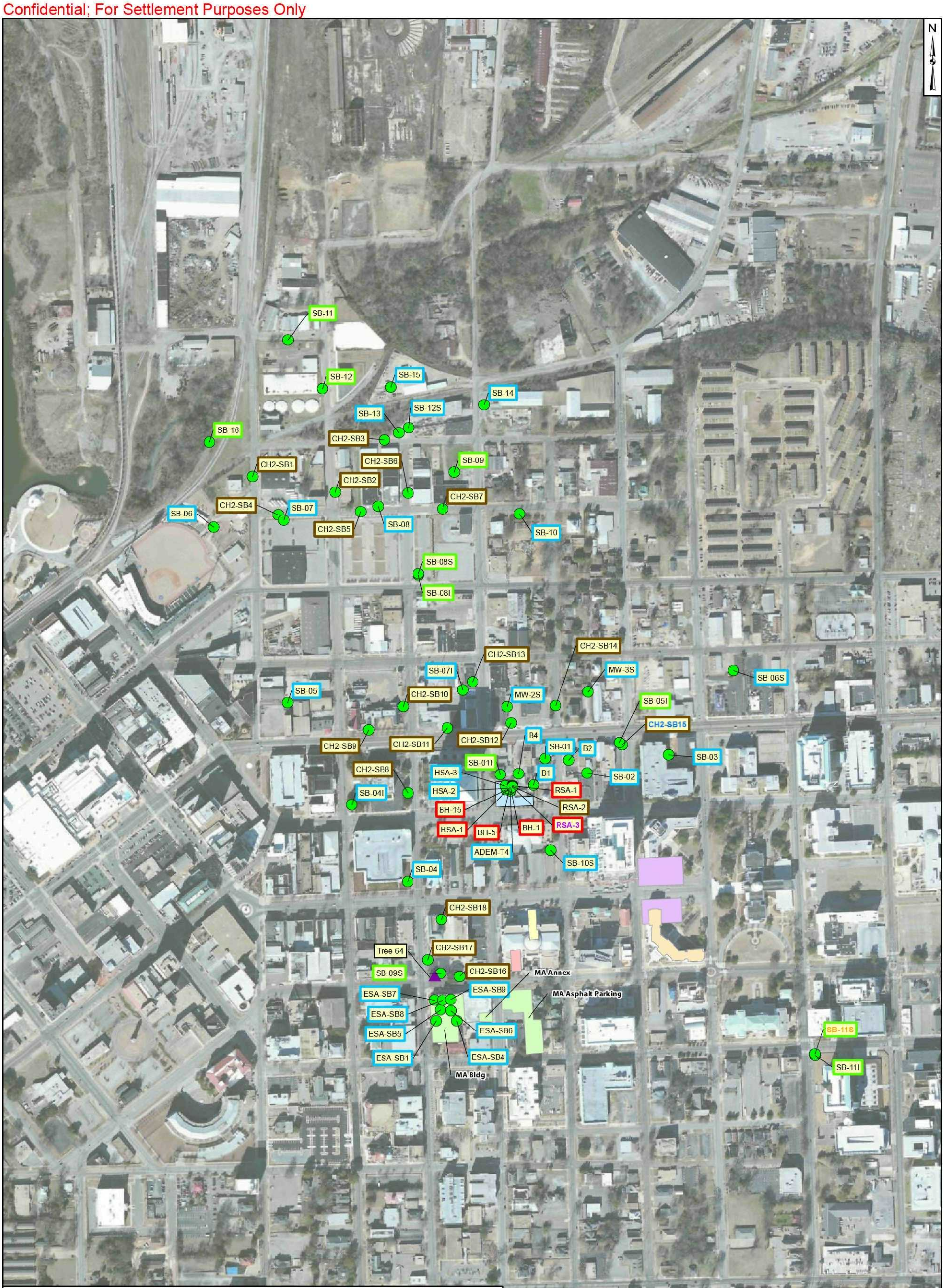
Orange outline indicates locations of trees with only detections of PCE

Dark blue outline indicates locations of trees with detections of benzene and/or toluene

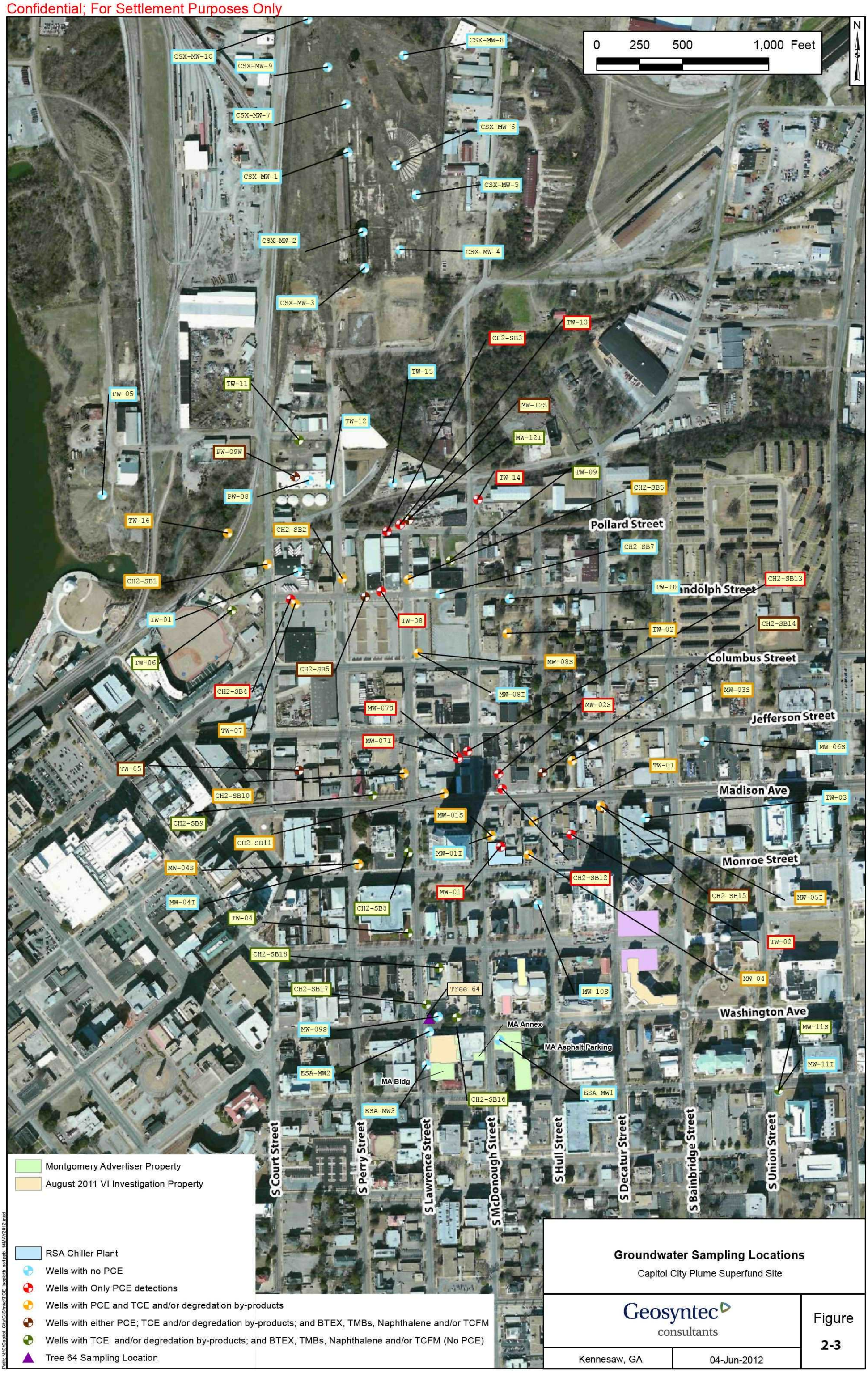
Light blue outline indicates locations of trees with no detections of VOCs

Adapted by Geosyntec from Landmeyer et al., 2011. "Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008-2010: U.S. Geological Survey Scientific Investigations Report 2011-5148." 2011.

Locations of Trees Cored During August 2008 Capitol City Plume Superfund Site		
Geosyntec consultants		Figure 2-1
Chicago, IL	31 May 2012	


N
SB-11
SB-12
SB-15
SB-14
SB-12S
SB-13
SB-16
CH2-SB3
CH2-SB1
CH2-SB6
SB-09
CH2-SB2
CH2-SB7
CH2-SB4
SB-07
SB-06
CH2-SB5
SB-08
SB-10
SB-08S
SB-08I
CH2-SB13
CH2-SB14
SB-07I
MW-3S
SB-06S
SB-05
CH2-SB10
MW-2S
SB-05I
CH2-SB15
CH2-SB9
CH2-SB11
CH2-SB12
B4
SB-01
B2
SB-03
CH2-SB8
SB-01I
B1
SB-02
HSA-3
HSA-2
RSA-1
SB-04I
BH-15
RSA-2
HSA-1
BH-5
BH-1
RSA-3
ADEM-T4
SB-10S
SB-04
CH2-SB18
Tree 64
CH2-SB17
SB-09S
CH2-SB16
MA Annex
ESA-SB7
ESA-SB9
MA Asphalt Parking
ESA-SB8
ESA-SB5
ESA-SB6
SB-11S
ESA-SB1
ESA-SB4
SB-11I
MA Bldg
Tree 64 Sampling Location
Soil Sample Locations
Soil Borings with no PCE
Soil Borings with only PCE detections
Soil Borings with PCE, TCE, degradation by products and BTEX, TMBs, naphthalene, TCFM
Soil Borings with TCE, degradation by products and BTEX, TMBs, naphthalene, TCFM (no PCE)
RSA Chiller Plant
August 2011 VI Investigation Property
Montgomery Advertiser Property
Notes:
1. Location name in ORANGE has the highest TCE detection
2. Location name in PURPLE has the highest PCE detection
3. Location name in BLUE has the highest BTEX and TMB detections
0 250 500 1,000 Feet
Soil Sampling Locations
Capitol City Plume Superfund Site
Geosyntec consultants
Figure 2-2
Kennesaw, GA
04-Jun-2012
Path: N:\C\Capitol City\GIS\mxd\Soil Locations.mxd

Confidential; For Settlement Purposes Only



Path: N:\CVCapitol_City\GIS\mxd\TCE_Isopleth_no1ppb_14MAY2012.mxd

Groundwater Sampling Locations

Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 04-Jun-2012

Figure 2-3

Notes:
- Isopleths were estimated based the most recent available groundwater concentrations for each constituent, which are shown on the figure. For non-detected constituents, a concentration of zero was assumed.
- Results reported in ug/l
- BTEX = sum of benzene, toluene, ethylbenzene, and xylene concentrations. As a conservative estimate, the DL was included in the sum for any non-detected values
- U = below the analytical detection limit
- J = estimated value above the analytical detection limit but below the reporting limit
- E = estimated value

Path: N:\GCapitol_City\GIS\mxd\BTEX_Isopleth_March.mxd

BTEX Isopleth

Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 09-Mar-2012

Figure 2-4

Notes:
- Isopleths were estimated based the most recent available groundwater concentrations for each constituent, which are shown on the figure. For non-detected constituents, a concentration of zero was assumed.
- Results reported in ug/l
- U = below the analytical detection limit
- J = estimated value above the analytical detection limit but below the reporting limit
- E = estimated value
- MCL = 5 ppb

Path: N:\C\Capitol_City\GIS\mxd\TCE_Isopleth_no1ppb_March.mxd

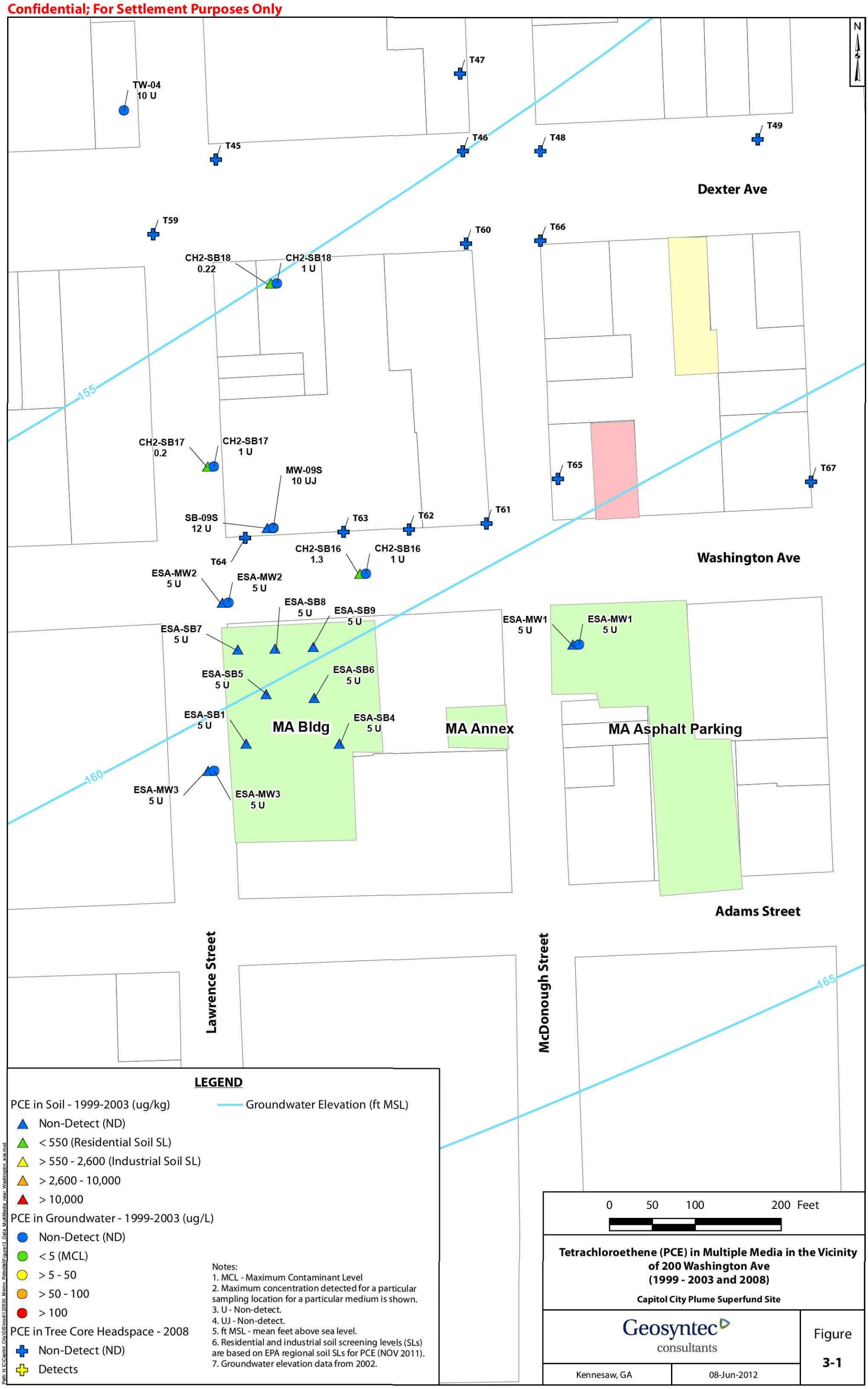
TCE Isopleth

Capitol City Plume Superfund Site

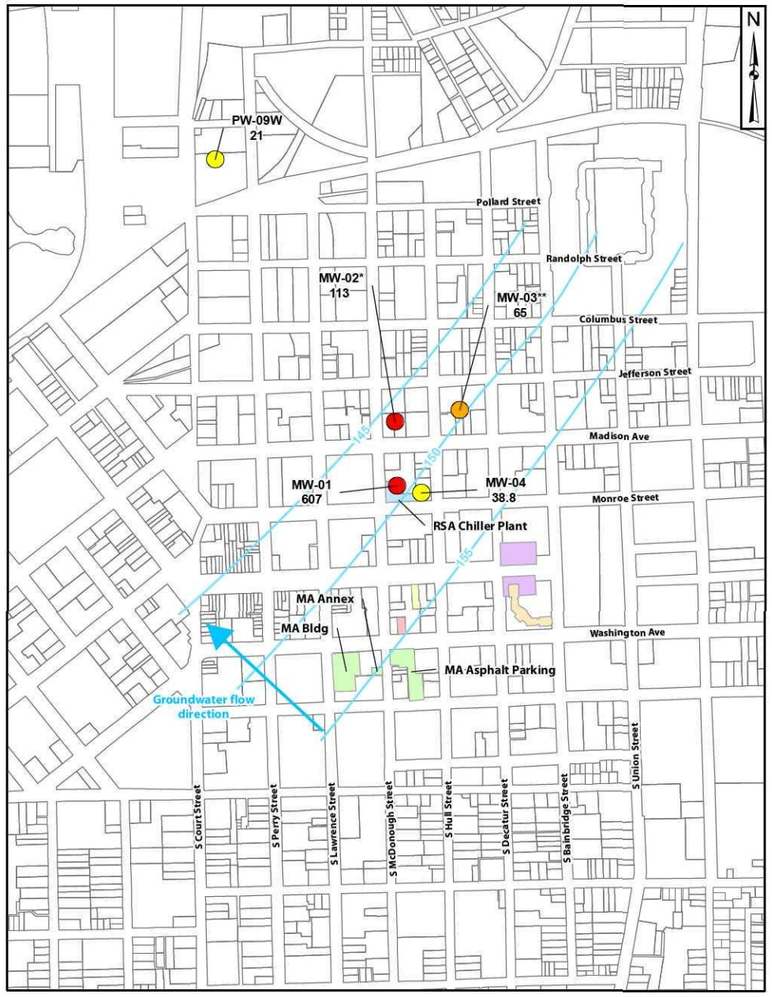
Geosyntec consultants

Kennesaw, GA | 09-Mar-2012

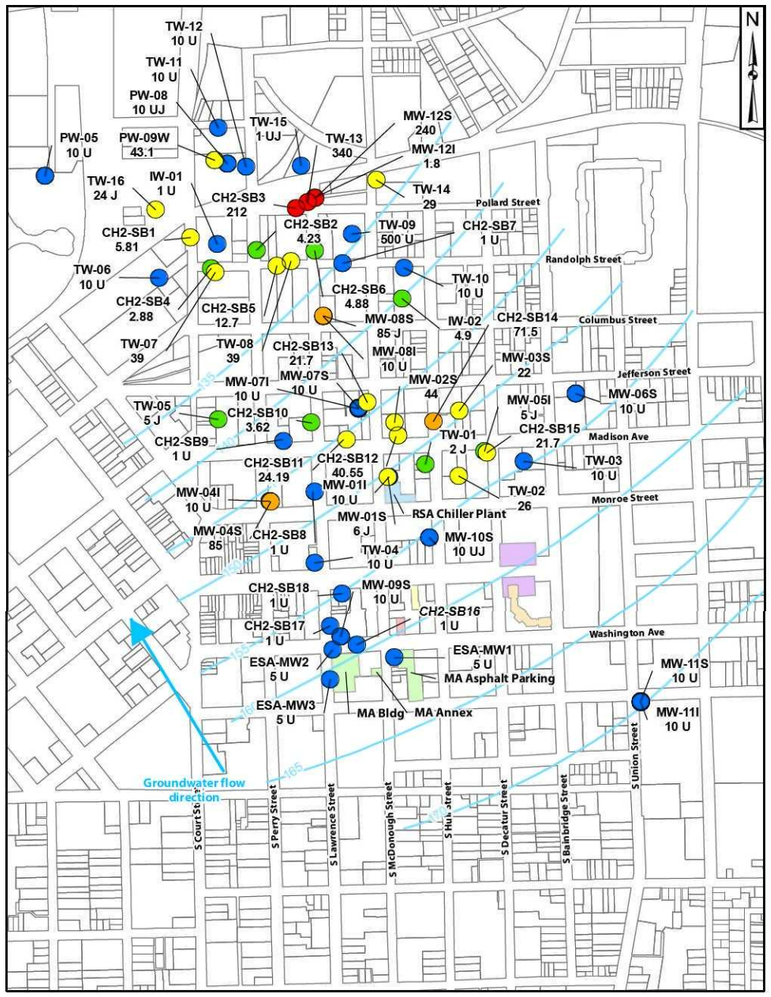
Figure **2-5**


N
TW-04
10 U
T47
T49
T45
T46
T48
Dexter Ave
T59
T60
T66
CH2-SB18
0.22
CH2-SB18
1 U
155
CH2-SB17
0.2
CH2-SB17
1 U
MW-09S
10 UJ
T65
T67
SB-09S
12 U
T63
T62
T61
T64
CH2-SB16
1.3
CH2-SB16
1 U
Washington Ave
ESA-MW2
5 U
ESA-MW2
5 U
ESA-SB8
5 U
ESA-SB9
5 U
ESA-MW1
5 U
ESA-MW1
5 U
ESA-SB7
5 U
ESA-SB5
5 U
ESA-SB6
5 U
ESA-SB1
5 U
MA Bldg
ESA-SB4
5 U
MA Annex
MA Asphalt Parking
160
ESA-MW3
5 U
ESA-MW3
5 U
Adams Street
Lawrence Street
McDonough Street
165
LEGEND
PCE in Soil - 1999-2003 (ug/kg)
Non-Detect (ND)
< 550 (Residential Soil SL)
> 550 - 2,600 (Industrial Soil SL)
> 2,600 - 10,000
> 10,000
PCE in Groundwater - 1999-2003 (ug/L)
Non-Detect (ND)
< 5 (MCL)
> 5 - 50
> 50 - 100
> 100
PCE in Tree Core Headspace - 2008
Non-Detect (ND)
Detects
Groundwater Elevation (ft MSL)
Notes:
1. MCL - Maximum Contaminant Level
2. Maximum concentration detected for a particular sampling location for a particular medium is shown.
3. U - Non-detect.
4. UJ - Non-detect.
5. ft MSL - mean feet above sea level.
6. Residential and industrial soil screening levels (SLs) are based on EPA regional soil SLs for PCE (NOV 2011).
7. Groundwater elevation data from 2002.
0 50 100 200 Feet
Tetrachloroethene (PCE) in Multiple Media in the Vicinity of 200 Washington Ave
(1999 - 2003 and 2008)
Capitol City Plume Superfund Site
Geosyntec consultants
Figure
3-1
Kennesaw, GA
08-Jun-2012
Path: N:\Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure13_Data_MultiMedia_near_Washington_ave.mxd

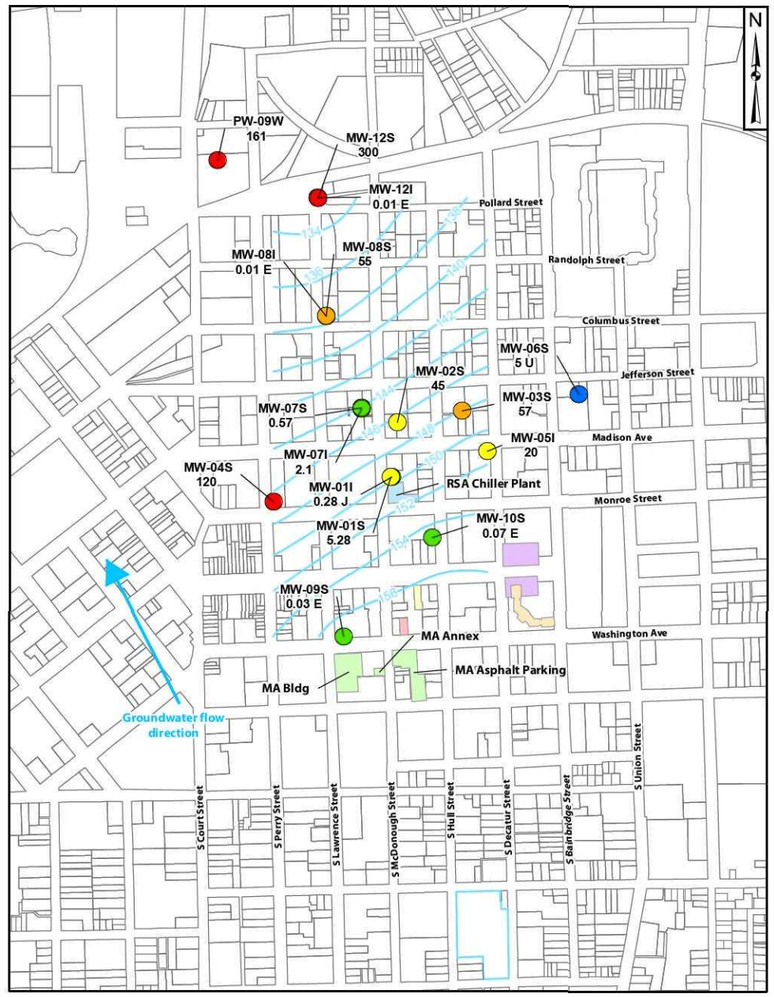
1991 - 1994



1999 - 2003



2007 - 2011



LEGEND

Concentration of PCE (ug/L)
- Non-Detect (ND)
- < 5 (MCL)
- > 5 - 50
- > 50 - 100
- > 100

August 2011 VI Investigation Property

Montgomery Advertiser Property

RSA Chiller Plant

Groundwater Elevation (mean feet above sea level)

Notes:
1. MCL - Maximum Contaminant Level
2. Maximum concentration detected for a particular well is shown within each time period.
3. * - MW-02 was renamed MW-02S during the Remedial Investigation.
4. ** - MW-03 was renamed MW-03S during the Remedial Investigation.
5. E - Estimated concentration.
6. J - Estimated concentation.
7. U - Non-detect.
8. UJ - Non-detect.

0 500 1,000 2,000 Feet

Distribution of Tetrachloroethene (PCE) in Groundwater Over Time

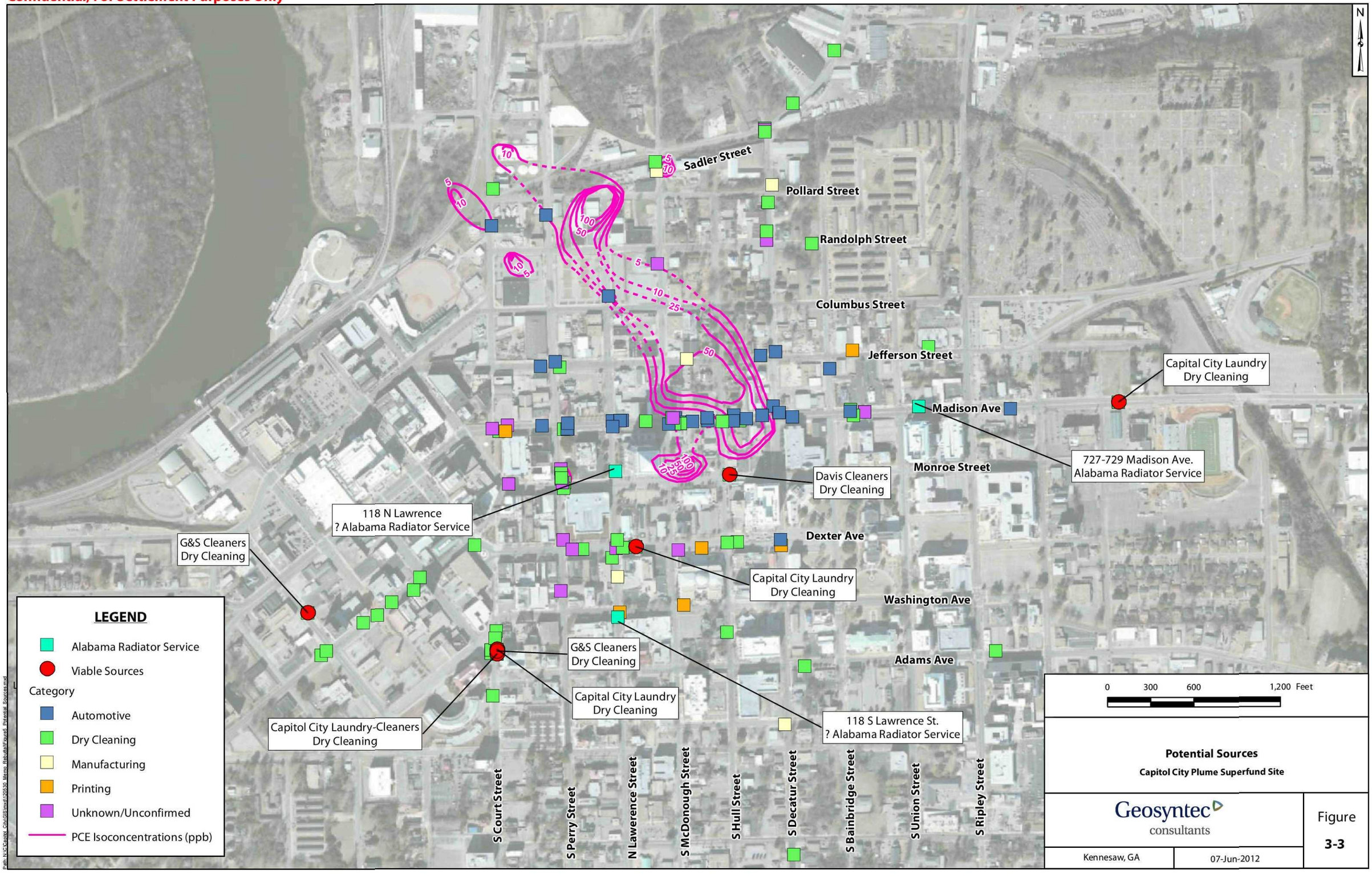
Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 08-Jun-2012

Figure 3-2

Path: N:\C\Capitol_City\GIS\mxd\120530_Memo_ReboundFigure12_PCE in GW over time.mxd



Potential Sources

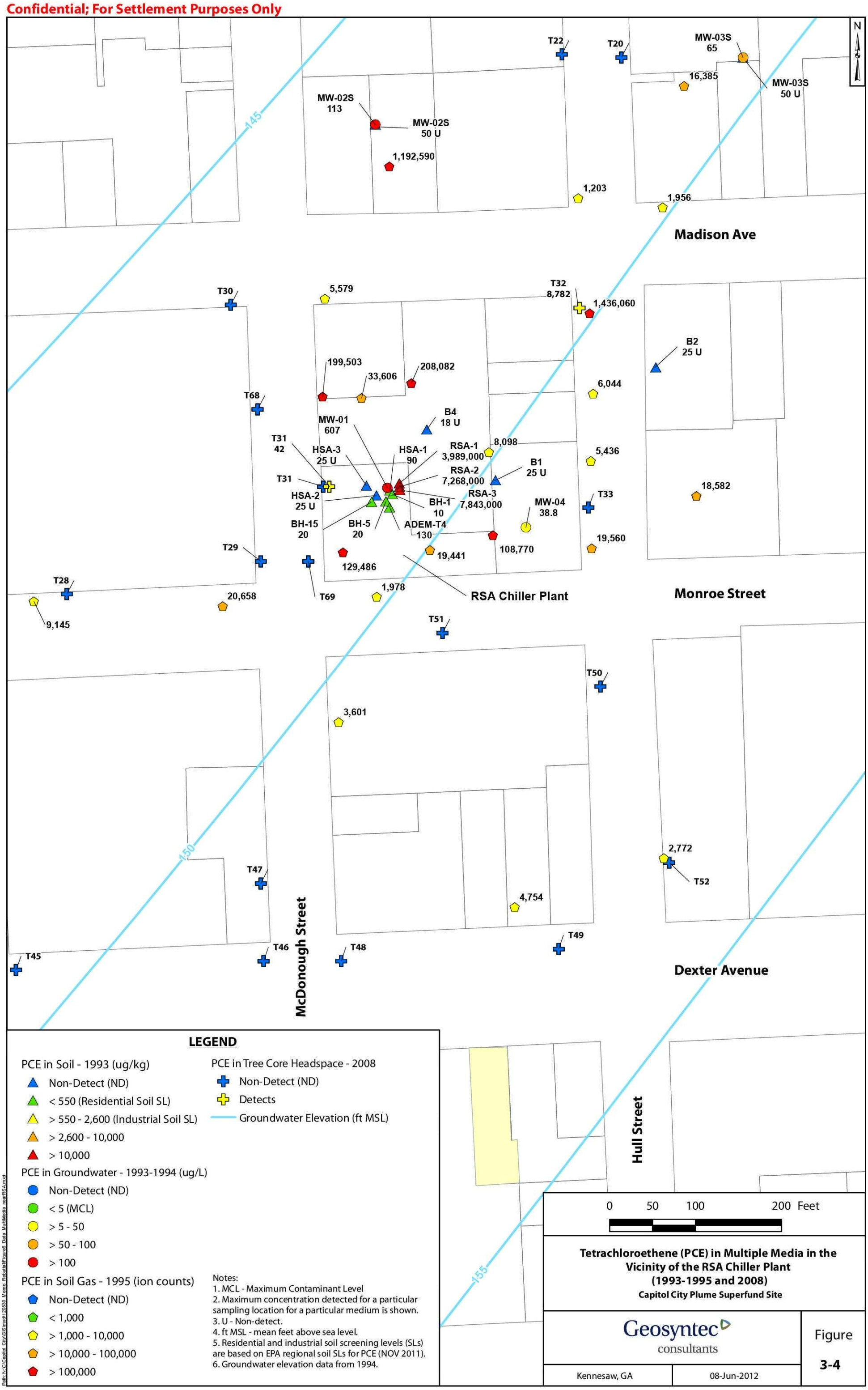
Capitol City Plume Superfund Site

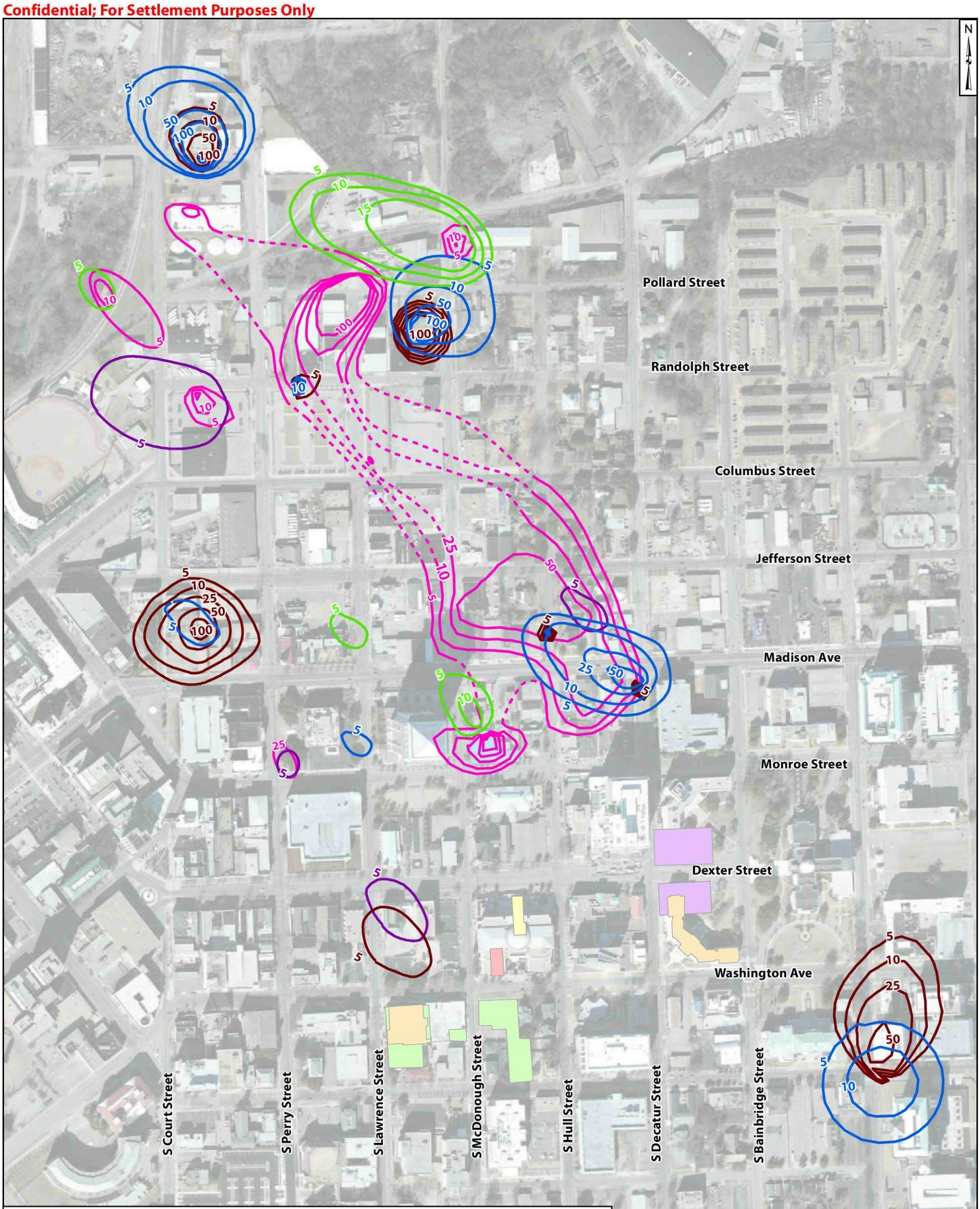
Geosyntec consultants

Kennesaw, GA | 07-Jun-2012

Figure 3-3

Path: N:\C\Capitol_City\GIS\mxd\120530_Memo_RebuttalFigure5_Potential_Sources.mxd


N
145
T22
T20
MW-03S
65
MW-03S
50 U
16,385
MW-02S
113
MW-02S
50 U
1,192,590
1,203
1,956
Madison Ave
T30
5,579
T32
8,782
1,436,060
B2
25 U
199,503
33,606
208,082
6,044
T68
MW-01
607
B4
18 U
T31
42
HSA-3
25 U
HSA-1
90
RSA-1
3,989,000
8,098
5,436
T31
HSA-2
25 U
RSA-2
7,268,000
B1
25 U
RSA-3
7,843,000
BH-1
10
MW-04
38.8
T33
18,582
BH-15
20
BH-5
20
ADEM-T4
130
19,560
T29
129,486
19,441
108,770
T28
T69
1,978
RSA Chiller Plant
Monroe Street
20,658
9,145
T51
T50
3,601
150
T47
2,772
T52
4,754
T49
T45
T46
T48
McDonough Street
Dexter Avenue
Hull Street
155
LEGEND
PCE in Soil - 1993 (ug/kg)
Non-Detect (ND)
< 550 (Residential Soil SL)
> 550 - 2,600 (Industrial Soil SL)
> 2,600 - 10,000
> 10,000
PCE in Groundwater - 1993-1994 (ug/L)
Non-Detect (ND)
< 5 (MCL)
> 5 - 50
> 50 - 100
> 100
PCE in Soil Gas - 1995 (ion counts)
Non-Detect (ND)
< 1,000
> 1,000 - 10,000
> 10,000 - 100,000
> 100,000
PCE in Tree Core Headspace - 2008
Non-Detect (ND)
Detects
Groundwater Elevation (ft MSL)
Notes:
1. MCL - Maximum Contaminant Level
2. Maximum concentration detected for a particular sampling location for a particular medium is shown.
3. U - Non-detect.
4. ft MSL - mean feet above sea level.
5. Residential and industrial soil screening levels (SLs) are based on EPA regional soil SLs for PCE (NOV 2011).
6. Groundwater elevation data from 1994.
0 50 100 200 Feet
Tetrachloroethene (PCE) in Multiple Media in the Vicinity of the RSA Chiller Plant (1993-1995 and 2008)
Capitol City Plume Superfund Site
Geosyntec consultants
Figure
3-4
Kennesaw, GA
08-Jun-2012
Path: N:\C\Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure6_Data_MultiMedia_nearRSA.mxd



LEGEND

- RSA Chiller Plant
- August 2011 VI Investigation Property
- Montgomery Advertiser Property
- PCE Isoconcentrations (ppb)
- TCE Isoconcentrations (ppb)
- BTEX Isoconcentrations (ppb)
- TMB Isoconcentrations (ppb)
- Chloroform Isoconcentrations (ppb)

Notes:
- All isoconcentration lines were generated from the most recent groundwater concentration data available at each location. For non-detect results, a concentration of zero was assumed.
- Tetrachlorethene (PCE)
- Trichloroethene (TCE)
- BTEX = sum of benzene, toluene, ethylbenzene, and xylene concentrations. As a conservative estimate, the detection limit was included in the sum for any non-detected values.
- TMB = sum of trimethylbenzene (TMB), 1,2,3-TMB, 1,2,4-TMB, and 1,3,5-TMB concentrations. As a conservative estimate, the detection limit was included in the sum for any non-detected values.
- Maximum Contaminant Levels (MCLs) in ug/L:
  - -PCE MCL = 5
  - -TCE MCL = 5
  - -Chloroform MCL = 80
  - -TMB MCL = not available
  - -Benzene MCL = 5
  - -Toluene MCL = 1,000
  - -Ethylbenzene = 700
  - -Xylenes(total) = 10,000

Comparison of PCE, TCE, BTEX, TMB and Chloroform Plumes at the Site

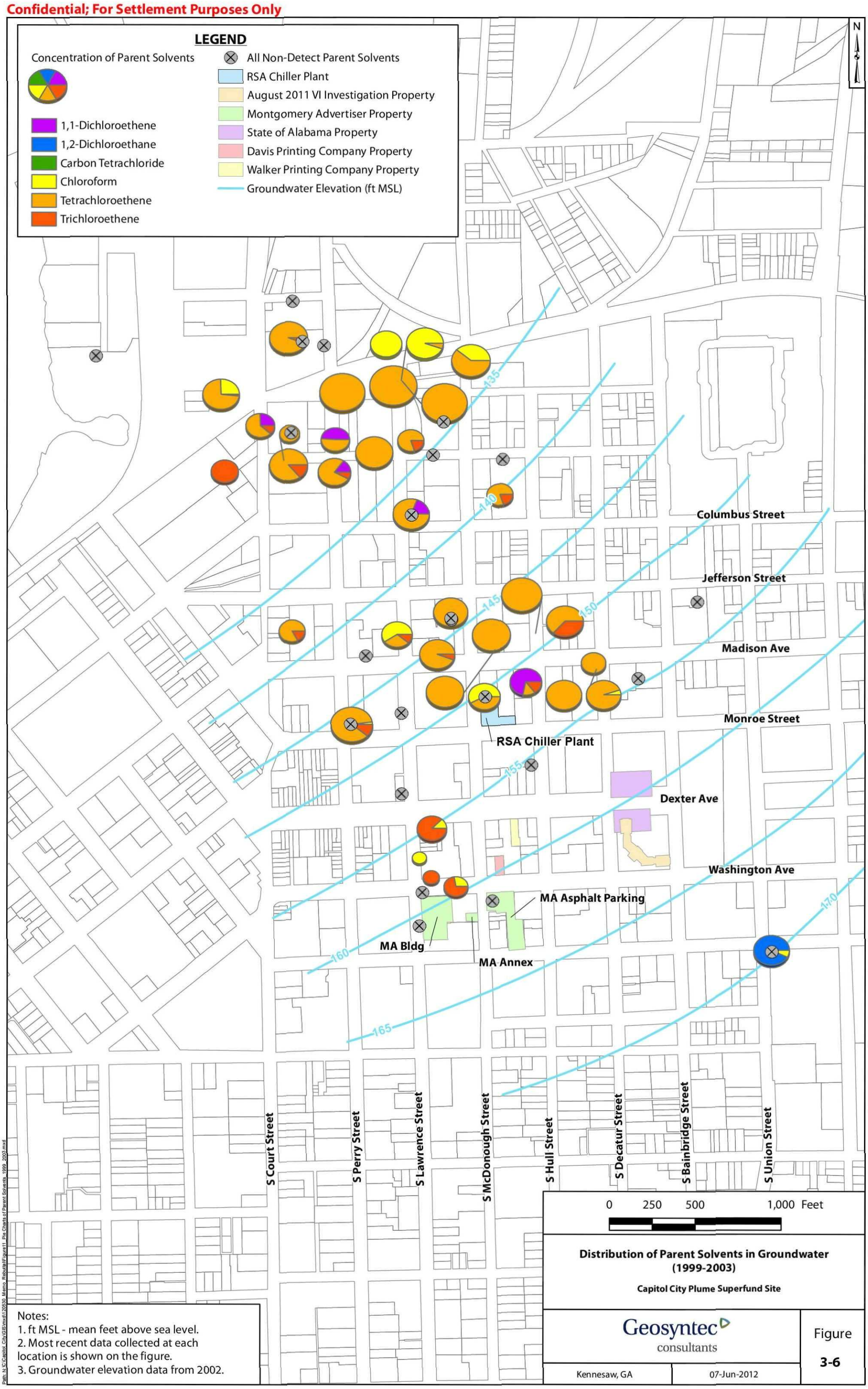
Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 08-Jun-2012

Figure **3-5**

Path: N:\O\Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure3-13_PCE_TCE_BTEX_TMB_Chloroform_Plumes_revised.mxd



Notes:
1. ft MSL - mean feet above sea level.
2. Most recent data collected at each location is shown on the figure.
3. Groundwater elevation data from 2002.

Distribution of Parent Solvents in Groundwater (1999-2003)

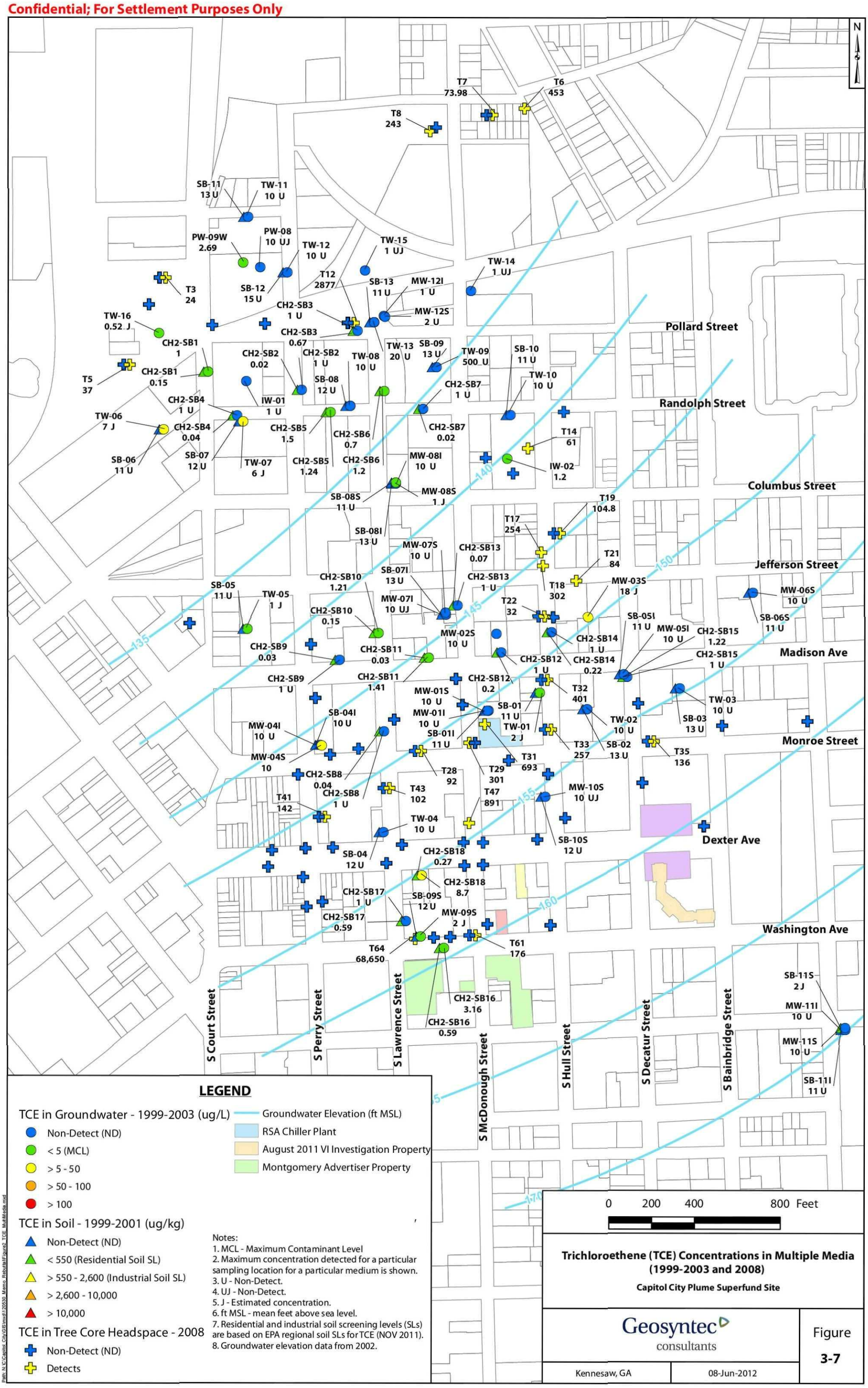
Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 07-Jun-2012

Figure **3-6**

Path: N:\C\Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure11_Pie Charts of Parent Solvents_1999_2003.mxd



Trichloroethene (TCE) Concentrations in Multiple Media (1999-2003 and 2008)

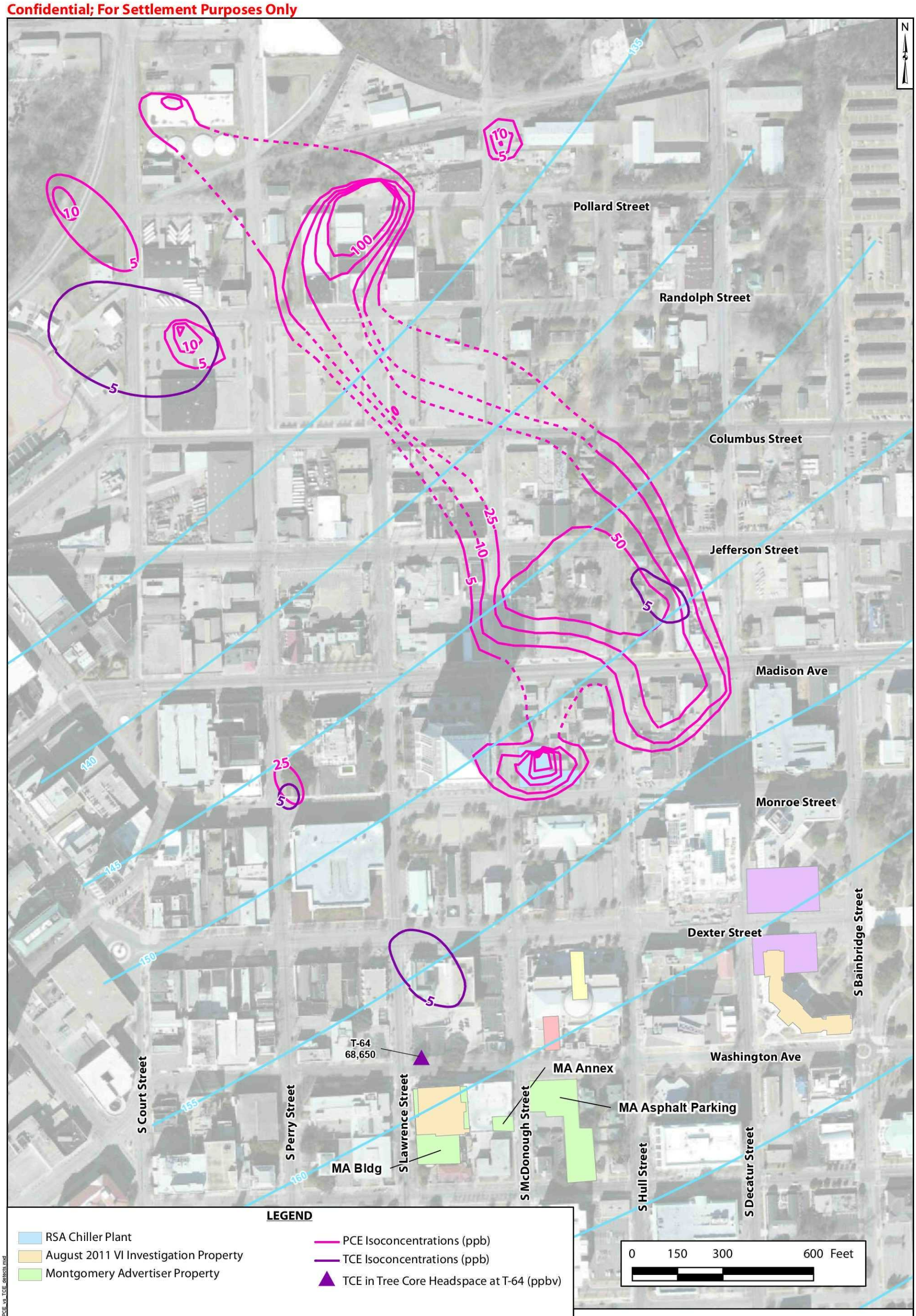
Capitol City Plume Superfund Site

Geosyntec consultants

Figure **3-7**

Kennesaw, GA | 08-Jun-2012

Path: N:\C\Capitol City\GIS\mxd\120530_Memo_RebuttalFigure3_TCE_MultiMedia.mxd



LEGEND

- RSA Chiller Plant
- August 2011 VI Investigation Property
- Montgomery Advertiser Property
- PCE Isoconcentrations (ppb)
- TCE Isoconcentrations (ppb)
- TCE in Tree Core Headspace at T-64 (ppbv)
- Groundwater Elevation (mean feet above sea level)

Notes:
- The PCE and TCE isoconcentration lines were generated from the most recent groundwater concentration data available for PCE and TCE at each location. For non-detect results, a concentration of zero was assumed.
- The maximum concentration of TCE detected in tree core headspace at T-64 is shown on the figure.
- Maximum Contaminant Levels (MCLs) in ug/L:
  -PCE MCL = 5
  -TCE MCL = 5
- Groundwater elevation data from 2002.

Tetrachloroethene (PCE) and Trichloroethene (TCE) Concentrations in Groundwater

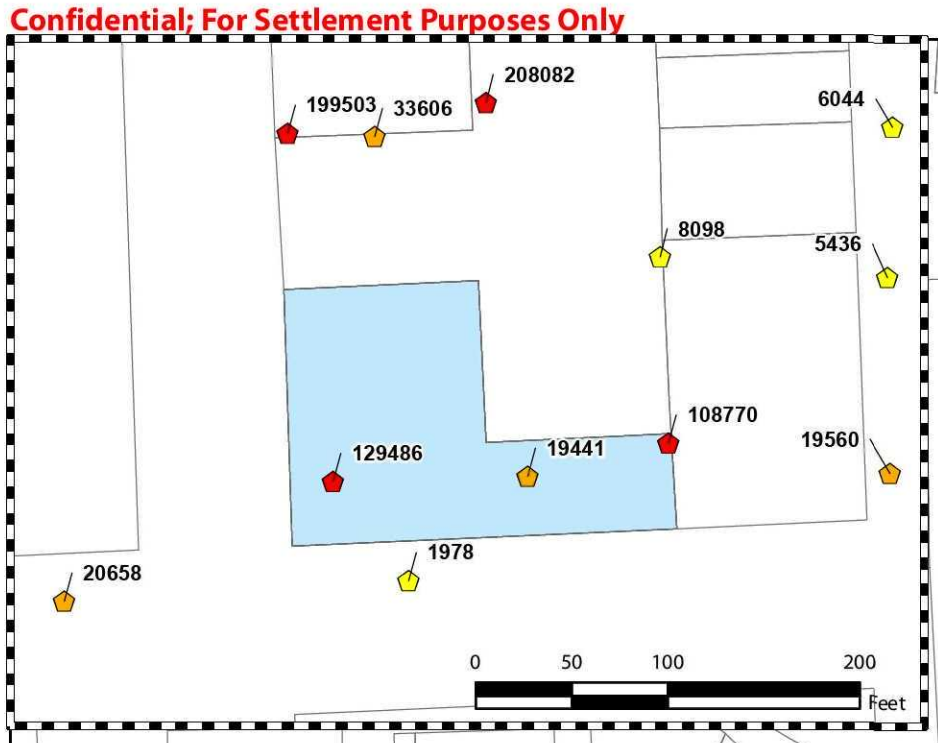
Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 07-Jun-2012

Figure **3-8**

Path: N:\CV\Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure1_PCE_vs_TCE_detects.mxd



LEGEND

- August 2011 VI Investigation Property
- Montgomery Advertiser Property
- RSA Chiller Plant

PCE in Soil Gas (ion counts)

- Non-Detect (ND)
- < 1,000
- > 1,000 - 10,000
- > 10,000 - 100,000
- > 100,000
- Groundwater Elevation (ft MSL)

Notes:
1. ft MSL - mean feet above sea level.
2. Groundwater elevation data from 1994.

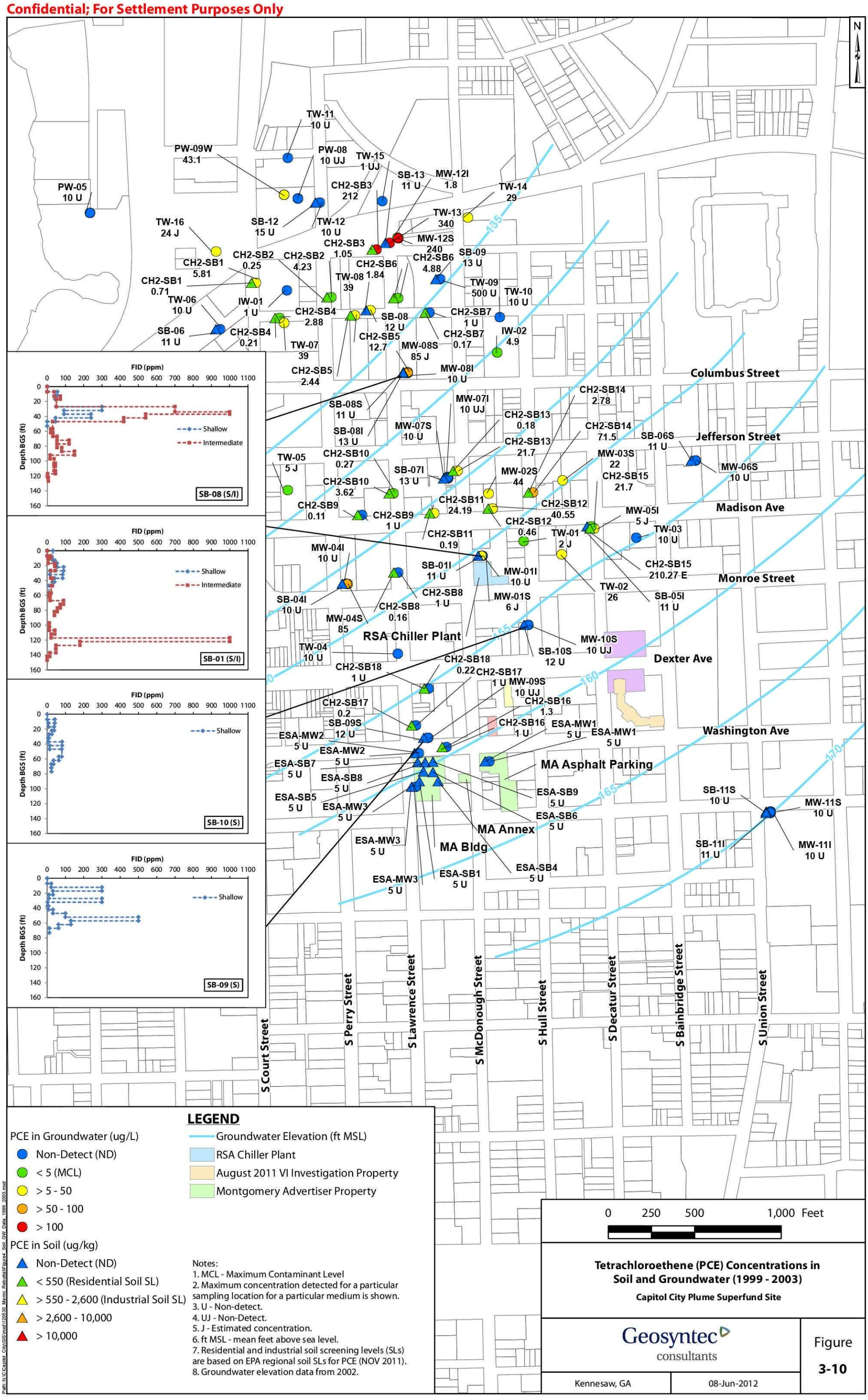
PCE in Soil Gas
(PETREX sampling event: 1994 - 1995)
Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 07-Jun-2012

Figure **3-9**

Path: N:\C\Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure3_1994_Petrex_Soil_Gas_Data.mxd



LEGEND

PCE in Groundwater (ug/L)
- Non-Detect (ND)
- < 5 (MCL)
- > 5 - 50
- > 50 - 100
- > 100

PCE in Soil (ug/kg)
- Non-Detect (ND)
- < 550 (Residential Soil SL)
- > 550 - 2,600 (Industrial Soil SL)
- > 2,600 - 10,000
- > 10,000

- Groundwater Elevation (ft MSL)
- RSA Chiller Plant
- August 2011 VI Investigation Property
- Montgomery Advertiser Property

Notes:
1. MCL - Maximum Contaminant Level
2. Maximum concentration detected for a particular sampling location for a particular medium is shown.
3. U - Non-detect.
4. UJ - Non-Detect.
5. J - Estimated concentration.
6. ft MSL - mean feet above sea level.
7. Residential and industrial soil screening levels (SLs) are based on EPA regional soil SLs for PCE (NOV 2011).
8. Groundwater elevation data from 2002.

0 250 500 1,000 Feet

Tetrachloroethene (PCE) Concentrations in Soil and Groundwater (1999 - 2003)

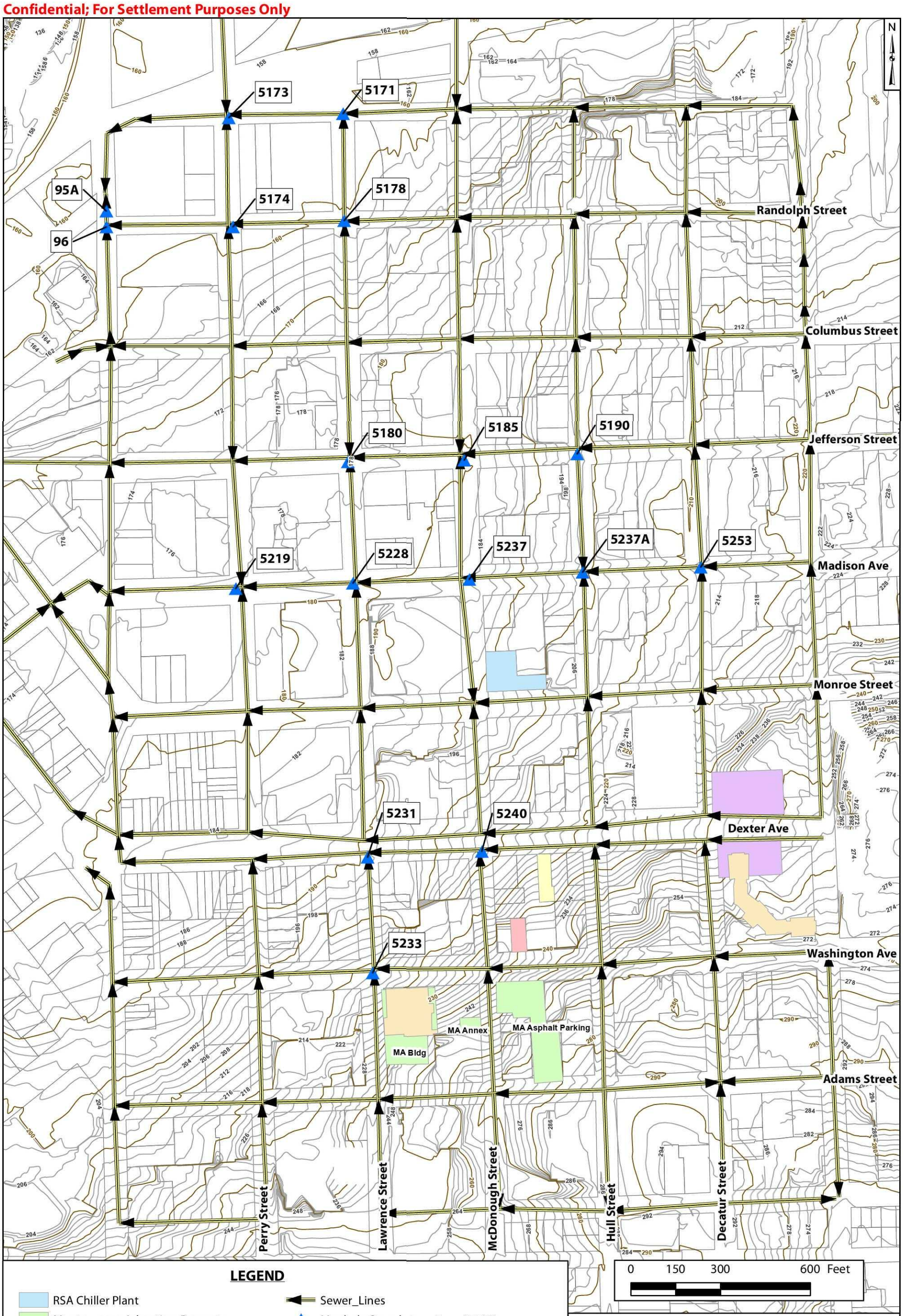
Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 08-Jun-2012

Figure **3-10**

Path: N:\C Capitol_City\GIS\mxd\120530_Memo_Rebuttal\Figure4_Soil_GW_Data_1999_2003.mxd



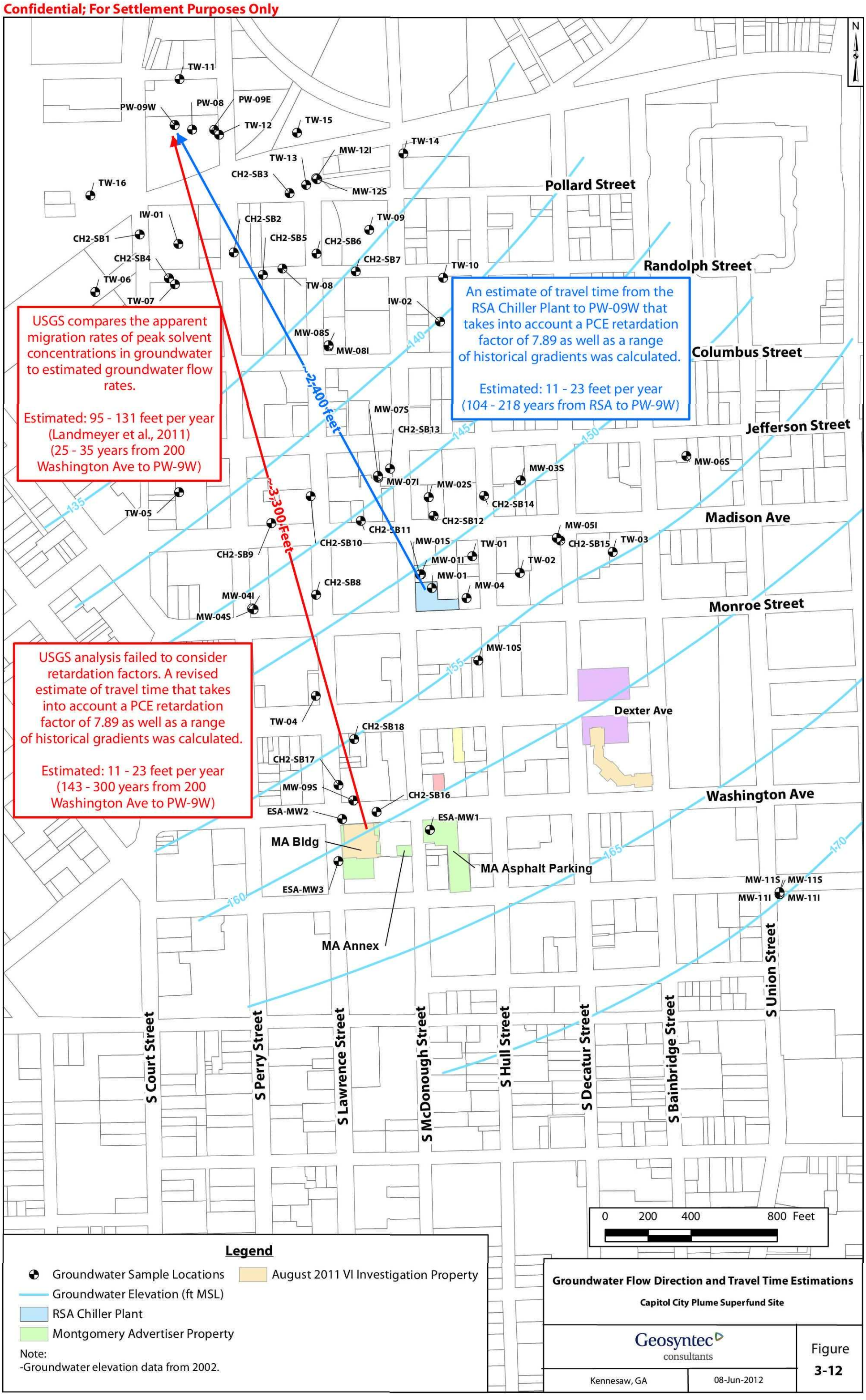
Sanitary Sewer Network and Site Topography

Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 08-Jun-2012

Figure **3-11**



USGS compares the apparent migration rates of peak solvent concentrations in groundwater to estimated groundwater flow rates.

Estimated: 95 - 131 feet per year
(Landmeyer et al., 2011)
(25 - 35 years from 200 Washington Ave to PW-9W)

An estimate of travel time from the RSA Chiller Plant to PW-09W that takes into account a PCE retardation factor of 7.89 as well as a range of historical gradients was calculated.

Estimated: 11 - 23 feet per year
(104 - 218 years from RSA to PW-9W)

USGS analysis failed to consider retardation factors. A revised estimate of travel time that takes into account a PCE retardation factor of 7.89 as well as a range of historical gradients was calculated.

Estimated: 11 - 23 feet per year
(143 - 300 years from 200 Washington Ave to PW-9W)

Legend

- Groundwater Sample Locations
- Groundwater Elevation (ft MSL)
- RSA Chiller Plant
- Montgomery Advertiser Property
- August 2011 VI Investigation Property

Note:
-Groundwater elevation data from 2002.

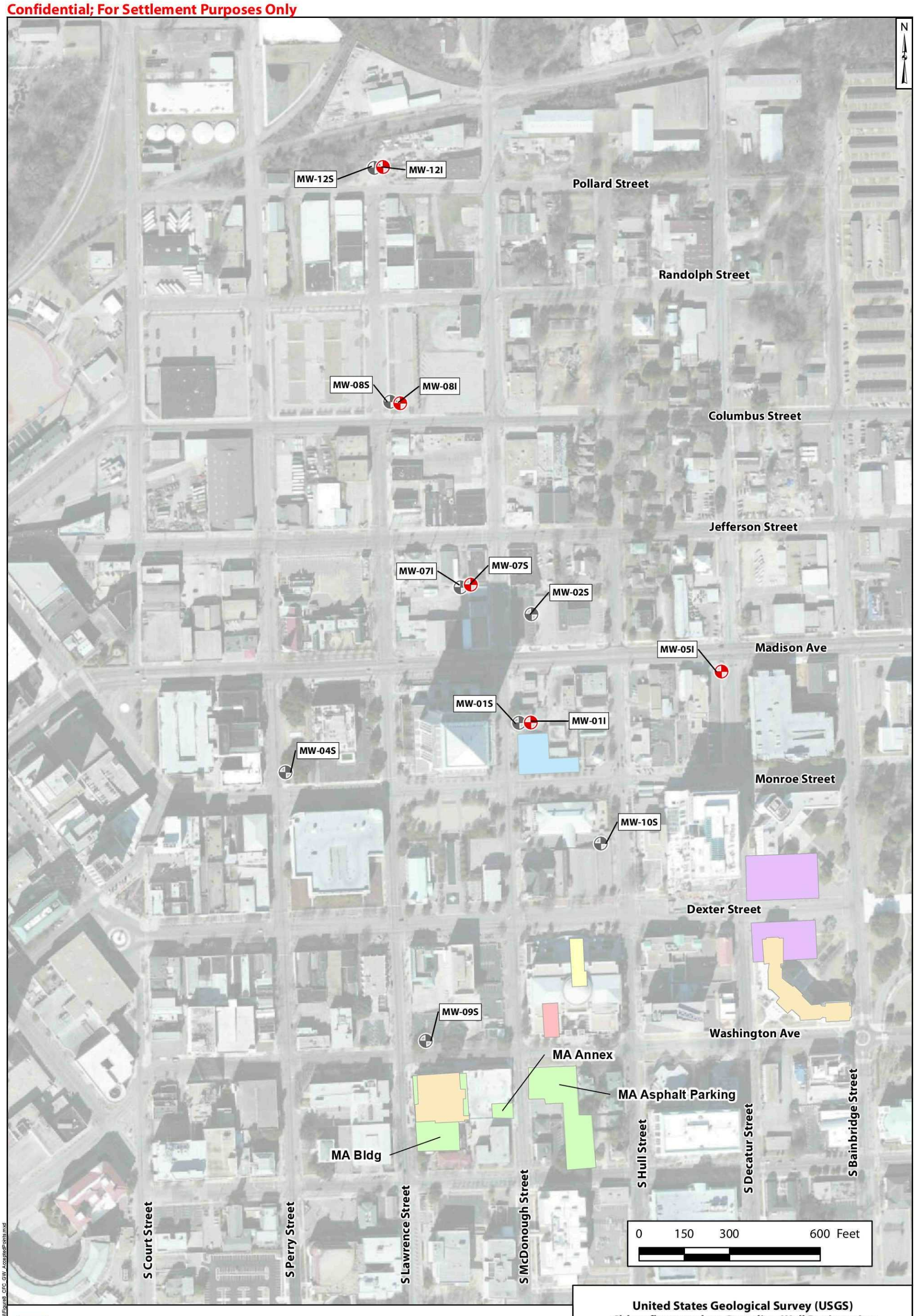
Groundwater Flow Direction and Travel Time Estimations

Capitol City Plume Superfund Site

Geosyntec consultants

Kennesaw, GA | 08-Jun-2012

Figure **3-12**



TABLES

Table 2-1. Summary of Soil Concentrations Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	CH2-SB16 (5'-7') 02/26/1999	CH2-SB16 (10'-12') 02/26/1999	CH2-SB16 (15'-17') 02/26/1999	CH2-SB16 (20'-22') 02/26/1999	CH2-SB16 (25'-27') 02/26/1999	CH2-SB16 (30'-32') 02/26/1999	CH2-SB16 (35'-37') 02/26/1999	CH2-SB16 (40'-42') 02/26/1999
1,1,1,2-tetrachloroethane	ug/kg					0.14			0.05
1,1,1-trichloroethane	ug/kg	0.03				0.1			0.07
1,1,2-trichloroethane	ug/kg			0.02		0.17			0.07
1,1-dichloroethane	ug/kg	0.01				0.07			0.04
1,1-dichloroethene	ug/kg	0.04				0.16			
1,1-dichloropropene	ug/kg	0.15				0.43			0.34
1,2,3-trichloropropane	ug/kg								
1,2,4-trimethylbenzene	ug/kg	0.57	1.57	0.39	0.46	1.06	0.31	0.32	0.52
1,2-dibromo-3-chloropropane	ug/kg	0.54	0 U						
1,2-dibromoethane	ug/kg					0.15			
1,2-dichloroethane	ug/kg	0.04				0.14		0.03	0.05
1,2-dichloropropane	ug/kg					0.13			0.07
1,3,5-trimethylbenzene	ug/kg	0.68	0.77	0.39	0.71	1.22	0.5	0.26	0.66
1,3-dichloropropane	ug/kg					0.27			
2-chlorotoluene	ug/kg	0.06	0 U	0.45	0.06	1.2	0.33		0.61
4-chlorotoluene	ug/kg	0.41	0 U	0.15	0.18	1.06	0.35	0.26	0.5
Acetone	ug/kg								
Benzene	ug/kg	0.11	0.13	0.1	0.06	0.23	0.09	0.11	0.16
Bromobenzene	ug/kg	0.49	0.34			0.89		0.18	0.44
Bromochloromethane	ug/kg	0.03		0.03	0.02	0.08			0.04
Bromodichloromethane	ug/kg	0.02				0.09			0.04
Bromoform	ug/kg	0.04				0.22		0.03	0.03
Bromomethane	ug/kg	0.6	0.56	0.31	0.5	0.81	0.11	0.92	0.18
Carbon tetrachloride	ug/kg	0.06				0.16			0.13
Chlorobenzene	ug/kg	0.19	0.07		0.02	0.49		0.07	0.24
Chlorodibromomethane	ug/kg					0.13			0.03
Chloroethane	ug/kg			0.09		0.11		0.14	
Chloroform	ug/kg					0.11	0.03		0.06
cis-1,2-dichloroethene	ug/kg	0.04				0.12			0.09
Dibromomethane	ug/kg					0.13			0.05
Dichlorodifluoromethane	ug/kg	0.23	0.11	0.07	0.07	0.39	0.09	0.1	0.38
Dichloromethane	ug/kg	**2.75**	**3.85**	**2.69**	**6.41**	**3**	**3.29**	**3.42**	**2.11**
Ethylbenzene	ug/kg	0.49	0.62	0.28	0.24	1.01	0.44	0.41	0.56
Isopropylbenzene	ug/kg	0.31	0.38	0.22	0.19	0.71	0.14	0.29	0.4
n-butylbenzene	ug/kg	0.69	0.46	0.33	0.28	1.57	0.33	0.45	0.6
n-propylbenzene	ug/kg	0.43	0.34	0.18	0.23	0.8	0.34	0.26	0.48
p-isopropyltoluene	ug/kg	0.54	0.27	0.27	0.34	1.23	0.38	0.4	0.52
sec-butylbenzene	ug/kg	0.41	0.2	0.25	0.27	1.06	0.35	0.41	0.51
Styrene	ug/kg	0.26	0.11	0.1	0.1	0.37	0.15	0.15	0.29
tert-butylbenzene	ug/kg	0.37	0.15	0.16	0.3	0.83	0.38	0.1	0.41
Tetrachloroethene	ug/kg	0.35	0.03	0.12	0.09	0.84	0.09	0.07	0.45
Toluene	ug/kg	0.27	0.39	0.17	0.07	0.47	0.24	0.26	0.31
trans-1,2-dichloroethene	ug/kg	0.08				0.23			0.2
trans-1,3-dichloropropene	ug/kg	1.78				1.84	0.01		1.17
Trichloroethene	ug/kg	0.15	0.03		0.02	0.39	0.01	0.03	0.28
Trichlorofluoromethane	ug/kg	0.16	0.08	0.06	0.07	0.32	0.08	0.07	0.3
Vinyl chloride	ug/kg					0.32			0.17
Xylene (m)	ug/kg	0.44	0.55	0.2	0.21	0.76	0.35	0.33	0.43
Xylene (o)	ug/kg	0.31	0.46	0.16	0.15	0.74	0.3	0.24	0.32
Xylene (p)	ug/kg	0.44	0.55	0.2	0.21	0.76	0.35	0.33	0.43
Xylene Total	ug/kg	1.19	1.56	0.56	0.57	**2.26**	1	0.9	1.18
1,2,3-trichlorobenzene	ug/kg	0.31	0.39	0.21	0.37	1.54	0.4	0.47	0.58
1,2,4-trichlorobenzene	ug/kg	0.73	0.22	0.33	0.39	1.92	0.38	0.33	0.68
1,2-dichlorobenzene	ug/kg	0.94	0.63	0.42		1.44	0.8	0.19	0.65
1,3-dichlorobenzene	ug/kg	0.75	0.55	0.11	0.14	1.58	0.53	0.79	0.78
1,4-dichlorobenzene	ug/kg	0.96	0.97	0.12	0.91	1.74	0.59	0.87	0.85
4-methylphenol	ug/kg								
Hexachlorobutadiene	ug/kg	0.24	0.52	0.33	0.43	1.69	0.48	0.43	0.6
Naphthalene	ug/kg	0.6	**5.1**	1.77	0.51	0.86	0.61	0.43	0.64
Octamethylcyclotetrasiloxane	ug/kg								
cis-1,3-dichloropropene	ug/kg	0.05				0.14			0.08

Notes:

1) Soil concentrations for organic contaminants that are detected at least once in the vicinity of Tree 64 (i.e., CH2-SB-16 through CH2-SB-18, SB-9S, SB-04, ESA-MW-1 through ESA-MW-3, ESA-SB-1, ESA-SB-4 through ESA-SB-9).

2) Sources of historical groundwater sampling data:

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama." Prepared for Montgomery County Commission. August 2003.
CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.
Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.

3) U = below the analytical detection limit

4) J = estimated concentration above the analytical detection limit but below the method reporting limit

5) Bold text indicates either a) for CH2M Hill data: values that are within the calibrated range indicated by CH2M Hill or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported with or without qualifiers. Note that CH2M Hill sewer study report (CH2M Hill, 1999) states that the calibrated range of the instruments used for soil analysis was between 2 µg/kg and 160 µg/kg.

6) Gray highlighting indicates a) for CH2M Hill data: values greater than the estimated quantitation limit (EQL) of 5 µg/kg for method SW846 8260 (and revisions of this method) or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported without qualifiers

Table 2-1. Summary of Soil Concentrations Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	CH2-SB16 (45'-47') 02/26/1999	CH2-SB16 (50'-52') 02/26/1999	CH2-SB16 (55'-57') 02/26/1999	CH2-SB16 (60'-62') 02/26/1999	CH2-SB16 (65'-67') 02/26/1999	CH2-SB17 (5'-7') 02/25/1999	CH2-SB17 (10'-12') 02/25/1999	CH2-SB17 (15'-17') 02/25/1999
1,1,1,2-tetrachloroethane	ug/kg	0.16	0.09				0 U	0.29	
1,1,1-trichloroethane	ug/kg	0.15	0.06						
1,1,2-trichloroethane	ug/kg	0.18	0.1						
1,1-dichloroethane	ug/kg	0.09	0.04						
1,1-dichloroethene	ug/kg	0.32	0.1		0.02			0.12	0.12
1,1-dichloropropene	ug/kg	0.77	0.24						0.36
1,2,3-trichloropropane	ug/kg	0.15				0.03			
1,2,4-trimethylbenzene	ug/kg	0.96	0.62	0.21	0.15	0.14	0.96	1.01	0.95
1,2-dibromo-3-chloropropane	ug/kg						0.52	1.07	1.04
1,2-dibromoethane	ug/kg	0.16	0.11						
1,2-dichloroethane	ug/kg	0.16	0.07		0.02		0.01		
1,2-dichloropropane	ug/kg	0.16					0.09	0.22	0.21
1,3,5-trimethylbenzene	ug/kg	1.28	0.94	0.38	0.38	0.08	0.31	1.78	1.73
1,3-dichloropropane	ug/kg								
2-chlorotoluene	ug/kg	1.06	0.8	0.16	0.27				0.63
4-chlorotoluene	ug/kg	1.22	0.82	0.16	0.16	0.11	0.65	0.93	0.93
Acetone	ug/kg								
Benzene	ug/kg	0.29	0.19	0.09	0.06	0.07	0.01	0.53	0.53
Bromobenzene	ug/kg	0.83	0.72	0.11	0.13	0.1	0.46	0.91	0.09
Bromochloromethane	ug/kg	0.12	0.06		0.01				
Bromodichloromethane	ug/kg	0.12	0.05						
Bromoform	ug/kg	0.13	0.05					0.83	0.84
Bromomethane	ug/kg	0.25	0.56	0.18	0.08	0.06	0.43	0.01	0.09
Carbon tetrachloride	ug/kg	0.28	0.09						
Chlorobenzene	ug/kg	0.59	0.34		0.05	0.04	0.01	0.46	0.54
Chlorodibromomethane	ug/kg	0.08						0.71	
Chloroethane	ug/kg		0.02	0.05					
Chloroform	ug/kg	0.13	0.07						
cis-1,2-dichloroethene	ug/kg	0.18	0.1						
Dibromomethane	ug/kg	0.13	0.06						
Dichlorodifluoromethane	ug/kg	0.68	0.24	0.07	0.08	0.06	0.06		
Dichloromethane	ug/kg	**3.17**	**2.84**	**2.78**	1.91	**2.22**	0.25		
Ethylbenzene	ug/kg	0.85	0.51	0.34	0.17	0.18	0.02	0.92	0.77
Isopropylbenzene	ug/kg	0.83	0.58	0.16	0.12	0.07	0.02	0.68	0.19
n-butylbenzene	ug/kg	1.7	0.98	0.27	0.18	0.19	0.83	0.91	0.52
n-propylbenzene	ug/kg	1.06	0.55	0.11	0.16	0.18	0.78	0.4	0.28
p-isopropyltoluene	ug/kg	1.36	0.77	0.12	0.2	0.21	0.91	0.61	0.37
sec-butylbenzene	ug/kg	1.13	0.67	0.15	0.19		1.03	0.9	0.72
Styrene	ug/kg	0.43	0.27	0.03	0.11	0.17	0.01	1.09	1.07
tert-butylbenzene	ug/kg	0.84	0.57	0.28	0.16	0.21	0.04	1.01	0.83
Tetrachloroethene	ug/kg	1.3	0.49	0.07	0.08	0.04	0.01		
Toluene	ug/kg	0.66	0.36	0.21	0.19	0.2	0.15	0.44	0.42
trans-1,2-dichloroethene	ug/kg	0.43	0.19						
trans-1,3-dichloropropene	ug/kg	**2.95**	1.69						
Trichloroethene	ug/kg	0.59	0.26		0.04	0.01	0.03	0.44	0.44
Trichlorofluoromethane	ug/kg	0.63	0.17	0.07	0.05	0.05	0.07		
Vinyl chloride	ug/kg	0.2	0.04						
Xylene (m)	ug/kg	0.97	0.61	0.17	0.12	0.21	0.34	0.18	0.03
Xylene (o)	ug/kg	0.74	0.46	0.5	0.09	0.12			
Xylene (p)	ug/kg	0.97	0.61	0.17	0.12	0.21	0.34	0.18	0.03
Xylene Total	ug/kg	**2.68**	1.68	0.84	0.33	0.54	0.68	0.36	0.06
1,2,3-trichlorobenzene	ug/kg	1.37	0.31	0.34	0.24	0.28	1.05	1.02	0.81
1,2,4-trichlorobenzene	ug/kg	1.76	1.17	0.32	0.22	0.2	0.39	0.57	0.37
1,2-dichlorobenzene	ug/kg	1.35	1.11	0.42	0.1	0.1	1.02	1.39	0.06
1,3-dichlorobenzene	ug/kg	1.47	1.11	0.15	0.37	0.38	0.83	0.3	0.85
1,4-dichlorobenzene	ug/kg	1.71	1.21	0.69	0.37	0.4	0.52	**2.22**	1.44
4-methylphenol	ug/kg								
Hexachlorobutadiene	ug/kg	1.46	0.31	0.4	0.27	0.26	0.55	0.59	0.36
Naphthalene	ug/kg	0.68	0.16	0.33	0.27	0.28	1.02	1.03	0.82
Octamethylcyclotetrasiloxane	ug/kg								
cis-1,3-dichloropropene	ug/kg	0.21	0.11		0.01				

Notes:

1) Soil concentrations for organic contaminants that are detected at least once in the vicinity of Tree 64 (i.e., CH2-SB-16 through CH2-SB-18, SB-9S, SB-04, ESA-MW-1 through ESA-MW-3, ESA-SB-1, ESA-SB-4 through ESA-SB-9).

2) Sources of historical groundwater sampling data:

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama." Prepared for Montgomery County Commission. August 2003.
CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.
Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.

3) U = below the analytical detection limit

4) J = estimated concentration above the analytical detection limit but below the method reporting limit

5) Bold text indicates either a) for CH2M Hill data: values that are within the calibrated range indicated by CH2M Hill or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported with or without qualifiers. Note that CH2M Hill sewer study report (CH2M Hill, 1999) states that the calibrated range of the instruments used for soil analysis was between 2 µg/kg and 160 µg/kg.

6) Gray highlighting indicates a) for CH2M Hill data: values greater than the estimated quantitation limit (EQL) of 5 µg/kg for method SW846 8260 (and revisions of this method) or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported without qualifiers

Table 2-1. Summary of Soil Concentrations Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	CH2-SB17 (20'-22') 02/25/1999	CH2-SB17 (25'-27') 02/25/1999	CH2-SB17 (30'-32') 02/25/1999	CH2-SB17 (35'-37') 02/25/1999	CH2-SB17 (40'-42') 02/25/1999	CH2-SB17 (45'-47') 02/25/1999	CH2-SB18 (5'-7') 02/25/1999	CH2-SB18 (10'-12') 02/25/1999
1,1,1,2-tetrachloroethane	ug/kg								
1,1,1-trichloroethane	ug/kg		0.01			0.02	0.02		
1,1,2-trichloroethane	ug/kg				0.7	0.06			
1,1-dichloroethane	ug/kg				0.26				
1,1-dichloroethene	ug/kg				0.18				
1,1-dichloropropene	ug/kg				0.43				
1,2,3-trichloropropane	ug/kg								
1,2,4-trimethylbenzene	ug/kg	0.66	0.45	0.36	1.73			0.57	0.38
1,2-dibromo-3-chloropropane	ug/kg	0.27			0.18	0.3			
1,2-dibromoethane	ug/kg								
1,2-dichloroethane	ug/kg			0.01		0.02			
1,2-dichloropropane	ug/kg	0.17							
1,3,5-trimethylbenzene	ug/kg	1.37	0.29	0.28	1.8	0.7	0.19	0.7	0.48
1,3-dichloropropane	ug/kg								
2-chlorotoluene	ug/kg		0.2	0.06	1.28			0.27	0.07
4-chlorotoluene	ug/kg	0.34	0.22	0.17	0.86	0.08	0.02	0.15	0.29
Acetone	ug/kg								
Benzene	ug/kg	0.51	0.06	0.06	0.6	0.12	0.07	0.21	0.1
Bromobenzene	ug/kg	0.2	0.01	0.07	0.67	0.12		0.12	0.16
Bromochloromethane	ug/kg			0.02	0.54				
Bromodichloromethane	ug/kg				0.44				
Bromoform	ug/kg				0.87				
Bromomethane	ug/kg		0.21	0.17	0.93	0.36	0.36	0.49	0.71
Carbon tetrachloride	ug/kg				0.43				
Chlorobenzene	ug/kg	0.45	0.02		0.56	0.04			
Chlorodibromomethane	ug/kg				0.86				
Chloroethane	ug/kg		0.03			0.08			
Chloroform	ug/kg							0.04	
cis-1,2-dichloroethene	ug/kg								
Dibromomethane	ug/kg								
Dichlorodifluoromethane	ug/kg		0.08	0.06		0.18	0.1	0.1	0.1
Dichloromethane	ug/kg		**6.33**	**6.3**		**3.92**	**4.42**	1.19	0.91
Ethylbenzene	ug/kg	0.69	0.22	0.15	1.84	0.16		0.44	0.35
Isopropylbenzene	ug/kg		0.26	0.16	0.67	0.2	0.21	0.3	0.12
n-butylbenzene	ug/kg		0.32	0.21	0.39	0.98	0.12	0.39	0.39
n-propylbenzene	ug/kg	0.23	0.24	0.06	0.46	1.05	0.12	0.35	0.24
p-isopropyltoluene	ug/kg	0.09	0.34	0.26	0.59	0.62	0.03	0.36	0.33
sec-butylbenzene	ug/kg	0.39	0.27	0.22	0.64		0.07	0.37	0.33
Styrene	ug/kg	0.61	0.12	0.08	0.87			0.09	0.29
tert-butylbenzene	ug/kg	0.6	0.29	0.26	0.81	0.4	0.24	0.35	0.29
Tetrachloroethene	ug/kg		0.1	0.06		0.2	0.03	0.12	0.08
Toluene	ug/kg	0.48	0.08	0.06	0.82	0.36	0.21	0.34	0.16
trans-1,2-dichloroethene	ug/kg		0.01						
trans-1,3-dichloropropene	ug/kg				**3.75**			1.61	
Trichloroethene	ug/kg	0.45	0.02		0.59	0.06	0.03	0.01	
Trichlorofluoromethane	ug/kg		0.07	0.06		0.14	0.1	0.08	0.07
Vinyl chloride	ug/kg								
Xylene (m)	ug/kg		0.19	0.14	0.76	0.26	0.09	0.37	0.19
Xylene (o)	ug/kg	0.22	0.14	0.12	1.17	0.16	0.07	0.39	0.16
Xylene (p)	ug/kg		0.19	0.14	0.76	0.26	0.09	0.37	0.19
Xylene Total	ug/kg	0.22	0.52	0.4	**2.69**	0.68	0.25	1.13	0.54
1,2,3-trichlorobenzene	ug/kg	0.53	0.44	0.28	1.06	1.09	1.05	0.35	0.33
1,2,4-trichlorobenzene	ug/kg		0.45	0.31	0.44	1.27	0.72	0.37	0.34
1,2-dichlorobenzene	ug/kg	0.46						0.48	0.2
1,3-dichlorobenzene	ug/kg	0.89	0.16	0.36	**3.02**	1.55		0.66	0.38
1,4-dichlorobenzene	ug/kg	1.43	0.91	0.83	**3.16**	1.35	1.53	0.8	0.22
4-methylphenol	ug/kg								
Hexachlorobutadiene	ug/kg		0.46	0.31	0.16	1.55	0.67	0.49	0.2
Naphthalene	ug/kg	0.54	0.49	0.39	0.97	1.17	0.76	0.66	0.45
Octamethylcyclotetrasiloxane	ug/kg								
cis-1,3-dichloropropene	ug/kg				1.06				

Notes:

1) Soil concentrations for organic contaminants that are detected at least once in the vicinity of Tree 64 (i.e., CH2-SB-16 through CH2-SB-18, SB-9S, SB-04, ESA-MW-1 through ESA-MW-3, ESA-SB-1, ESA-SB-4 through ESA-SB-9).

2) Sources of historical groundwater sampling data:

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama." Prepared for Montgomery County Commission. August 2003.

CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.

3) U = below the analytical detection limit

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5) Bold text indicates either a) for CH2M Hill data: values that are within the calibrated range indicated by CH2M Hill or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported with or without qualifiers. Note that CH2M Hill sewer study report (CH2M Hill, 1999) states that the calibrated range of the instruments used for soil analysis was between 2 µg/kg and 160 µg/kg.

6) Gray highlighting indicates a) for CH2M Hill data: values greater than the estimated quantitation limit (EQL) of 5 µg/kg for method SW846 8260 (and revisions of this method) or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported without qualifiers

Table 2-1. Summary of Soil Concentrations Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	CH2-SB18 (15'-17') 02/25/1999	CH2-SB18 (20'-22') 02/25/1999	CH2-SB18 (25'-27') 02/25/1999	CH2-SB18 (30'-32') 02/25/1999	CH2-SB18 (35'-37') 02/25/1999	CH2-SB18 (40'-42') 02/25/1999	SB-09S (58'-59') 03/01/2000	SB-04 (36'-38') 01/01/2001
1,1,1,2-tetrachloroethane	ug/kg					0.02			
1,1,1-trichloroethane	ug/kg					0.02			
1,1,2-trichloroethane	ug/kg								
1,1-dichloroethane	ug/kg					0.02			
1,1-dichloroethene	ug/kg					0.03			
1,1-dichloropropene	ug/kg					0.12			
1,2,3-trichloropropane	ug/kg								
1,2,4-trimethylbenzene	ug/kg	0.26	**12.91**	0.53	0.19	0.39			
1,2-dibromo-3-chloropropane	ug/kg								
1,2-dibromoethane	ug/kg								
1,2-dichloroethane	ug/kg		0.03	0.01		0.04			
1,2-dichloropropane	ug/kg			0.02					
1,3,5-trimethylbenzene	ug/kg	0.38	**4.93**	0.41	0.5	0.73	0.24		
1,3-dichloropropane	ug/kg								
2-chlorotoluene	ug/kg	0.16		0.12	0.08	0.44	0.43		
4-chlorotoluene	ug/kg	0.08		0.12	0.15	0.34	0.01		
Acetone	ug/kg							12 U	**13**
Benzene	ug/kg	0.08	0.42	0.07	0.09	0.12	0.35		12 U
Bromobenzene	ug/kg		0.27	0.09		0.26	0.11		
Bromochloromethane	ug/kg					0.03			
Bromodichloromethane	ug/kg					0.04			
Bromoform	ug/kg						0.49		
Bromomethane	ug/kg	0.37	0.12	0.12	0.07	0.14			
Carbon tetrachloride	ug/kg					0.06			
Chlorobenzene	ug/kg					0.11	0.19		
Chlorodibromomethane	ug/kg					0.01			
Chloroethane	ug/kg								
Chloroform	ug/kg					0.06			
cis-1,2-dichloroethene	ug/kg					0.04			
Dibromomethane	ug/kg								
Dichlorodifluoromethane	ug/kg	0.09	0.06	0.06	0.07	0.19			
Dichloromethane	ug/kg	0.88	**3.47**	**3.97**	1.04	**2.02**		**27 J**	12 U
Ethylbenzene	ug/kg	0.11	**8.24**	0.23	0.19	0.29	0.11		
Isopropylbenzene	ug/kg	0.21	1.25	0.2	0.12	0.34	0.07		
n-butylbenzene	ug/kg	0.18	1.2	0.27	0.18	0.53			
n-propylbenzene	ug/kg	0.2	**2.36**	0.29	0.15	0.39			
p-isopropyltoluene	ug/kg	0.33	0.98	0.31	0.28	0.5			
sec-butylbenzene	ug/kg	0.22	0.52	0.25		0.44			
Styrene	ug/kg	0.12		0.03	0.09	0.14	0.27		
tert-butylbenzene	ug/kg	0.24	1.35	0.29	0.25	0.33	0.09		
Tetrachloroethene	ug/kg			0.03	0.07	0.22		12 U	
Toluene	ug/kg	0.15	**16.61**	0.12	0.22	0.32	0.22	12 U	12 U
trans-1,2-dichloroethene	ug/kg					0.07			
trans-1,3-dichloropropene	ug/kg					1.21			
Trichloroethene	ug/kg	0.01		0.02	0.01	0.1	0.27	12 U	12 U
Trichlorofluoromethane	ug/kg	0.05	0.06	0.08	0.06	0.13		12 U	12 U
Vinyl chloride	ug/kg								
Xylene (m)	ug/kg	0.16	**19.41**	0.26	0.18	0.32			
Xylene (o)	ug/kg	0.04	**11.19**	0.2	0.19	0.28	0.11		
Xylene (p)	ug/kg	0.16	**19.41**	0.26	0.18	0.32			
Xylene Total	ug/kg	0.36	**50.01**	0.72	0.55	0.92	0.11		
1,2,3-trichlorobenzene	ug/kg	0.23	0.42	0.38	0.26	0.51	0.08		
1,2,4-trichlorobenzene	ug/kg	0.26	0.45	0.25	0.22	0.54			
1,2-dichlorobenzene	ug/kg		0.39	0.24		0.65			
1,3-dichlorobenzene	ug/kg	0.11	0.14	0.81	0.53	0.29			
1,4-dichlorobenzene	ug/kg	0.6	0.4	0.71	0.54	0.95	0.38		
4-methylphenol	ug/kg							**81 J**	
Hexachlorobutadiene	ug/kg	0.27	0.4	0.4	0.25	0.58			
Naphthalene	ug/kg	0.34	**4.54**	0.52	0.24	0.36	0.03		
Octamethylcyclotetrasiloxane	ug/kg								**8 J**
cis-1,3-dichloropropene	ug/kg					0.04			

Notes:

1) Soil concentrations for organic contaminants that are detected at least once in the vicinity of Tree 64 (i.e., CH2-SB-16 through CH2-SB-18, SB-9S, SB-04, ESA-MW-1 through ESA-MW-3, ESA-SB-1, ESA-SB-4 through ESA-SB-9).

2) Sources of historical groundwater sampling data:

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama." Prepared for Montgomery County Commission. August 2003.
CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.
Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.

3) U = below the analytical detection limit

4) J = estimated concentration above the analytical detection limit but below the method reporting limit

5) Bold text indicates either a) for CH2M Hill data: values that are within the calibrated range indicated by CH2M Hill or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported with or without qualifiers. Note that CH2M Hill sewer study report (CH2M Hill, 1999) states that the calibrated range of the instruments used for soil analysis was between 2 µg/kg and 160 µg/kg.

6) Gray highlighting indicates a) for CH2M Hill data: values greater than the estimated quantitation limit (EQL) of 5 µg/kg for method SW846 8260 (and revisions of this method) or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported without qualifiers

Table 2-1. Summary of Soil Concentrations Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	ESA-MW1 (30'-35') 05/12/2003	ESA-MW1 (60'-65') 05/12/2003	ESA-MW2 (0'-5') 05/13/2003	ESA-MW2 (25'-30') 05/13/2003	ESA-MW3 (35'-40') 05/14/2003	ESA-MW3 (55'-60') 05/14/2003
1,1,1,2-tetrachloroethane	ug/kg						
1,1,1-trichloroethane	ug/kg						
1,1,2-trichloroethane	ug/kg						
1,1-dichloroethane	ug/kg						
1,1-dichloroethene	ug/kg						
1,1-dichloropropene	ug/kg						
1,2,3-trichloropropane	ug/kg						
1,2,4-trimethylbenzene	ug/kg						
1,2-dibromo-3-chloropropane	ug/kg						
1,2-dibromoethane	ug/kg						
1,2-dichloroethane	ug/kg						
1,2-dichloropropane	ug/kg						
1,3,5-trimethylbenzene	ug/kg						
1,3-dichloropropane	ug/kg						
2-chlorotoluene	ug/kg						
4-chlorotoluene	ug/kg						
Acetone	ug/kg						
Benzene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U
Bromobenzene	ug/kg						
Bromochloromethane	ug/kg						
Bromodichloromethane	ug/kg						
Bromoform	ug/kg						
Bromomethane	ug/kg						
Carbon tetrachloride	ug/kg						
Chlorobenzene	ug/kg						
Chlorodibromomethane	ug/kg						
Chloroethane	ug/kg						
Chloroform	ug/kg						
cis-1,2-dichloroethene	ug/kg						
Dibromomethane	ug/kg						
Dichlorodifluoromethane	ug/kg						
Dichloromethane	ug/kg						
Ethylbenzene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	ug/kg						
n-butylbenzene	ug/kg						
n-propylbenzene	ug/kg						
p-isopropyltoluene	ug/kg						
sec-butylbenzene	ug/kg						
Styrene	ug/kg						
tert-butylbenzene	ug/kg						
Tetrachloroethene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-dichloroethene	ug/kg						
trans-1,3-dichloropropene	ug/kg						
Trichloroethene	ug/kg						
Trichlorofluoromethane	ug/kg						
Vinyl chloride	ug/kg						
Xylene (m)	ug/kg						
Xylene (o)	ug/kg						
Xylene (p)	ug/kg						
Xylene Total	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-trichlorobenzene	ug/kg						
1,2,4-trichlorobenzene	ug/kg						
1,2-dichlorobenzene	ug/kg						
1,3-dichlorobenzene	ug/kg						
1,4-dichlorobenzene	ug/kg						
4-methylphenol	ug/kg						
Hexachlorobutadiene	ug/kg						
Naphthalene	ug/kg						
Octamethylcyclotetrasiloxane	ug/kg						
cis-1,3-dichloropropene	ug/kg						

Notes:

1) Soil concentrations for organic contaminants that are detected at least once in the vicinity of Tree 64 (i.e., CH2-SB-16 through CH2-SB-18, SB-9S, SB-04, ESA-MW-1 through ESA-MW-3, ESA-SB-1, ESA-SB-4 through ESA-SB-9).

2) Sources of historical groundwater sampling data:

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama." Prepared for Montgomery County. August 2003.
CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.
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3) U = below the analytical detection limit

4) J = estimated concentration above the analytical detection limit but below the method reporting limit

5) Bold text indicates either a) for CH2M Hill data: values that are within the calibrated range indicated by CH2M Hill or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported with or without qualifiers. Note that CH2M Hill sewer study report (CH2M Hill, 1999) states that the calibrated range of the instruments used for soil analysis was between 2 µg/kg and

6) Gray highlighting indicates a) for CH2M Hill data: values greater than the estimated quantitation limit (EQL) of 5 µg/kg for method SW846 8260 (and revisions of this method) or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported <u>without</u> qualifiers

Table 2-1. Summary of Soil Concentrations Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	ESA-SB1 (10'-10') 05/15/2003	ESA-SB4 (10'-10') 05/15/2003	ESA-SB5 (10'-10') 05/15/2003	ESA-SB6 (10'-10') 05/15/2003	ESA-SB7 (10'-10') 05/15/2003	ESA-SB8 (10'-10') 05/15/2003	ESA-SB9 (10'-10') 05/16/2003
1,1,1,2-tetrachloroethane	ug/kg							
1,1,1-trichloroethane	ug/kg							
1,1,2-trichloroethane	ug/kg							
1,1-dichloroethane	ug/kg							
1,1-dichloroethene	ug/kg							
1,1-dichloropropene	ug/kg							
1,2,3-trichloropropane	ug/kg							
1,2,4-trimethylbenzene	ug/kg							
1,2-dibromo-3-chloropropane	ug/kg							
1,2-dibromoethane	ug/kg							
1,2-dichloroethane	ug/kg							
1,2-dichloropropane	ug/kg							
1,3,5-trimethylbenzene	ug/kg							
1,3-dichloropropane	ug/kg							
2-chlorotoluene	ug/kg							
4-chlorotoluene	ug/kg							
Acetone	ug/kg							
Benzene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromobenzene	ug/kg							
Bromochloromethane	ug/kg							
Bromodichloromethane	ug/kg							
Bromoform	ug/kg							
Bromomethane	ug/kg							
Carbon tetrachloride	ug/kg							
Chlorobenzene	ug/kg							
Chlorodibromomethane	ug/kg							
Chloroethane	ug/kg							
Chloroform	ug/kg							
cis-1,2-dichloroethene	ug/kg							
Dibromomethane	ug/kg							
Dichlorodifluoromethane	ug/kg							
Dichloromethane	ug/kg							
Ethylbenzene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	ug/kg							
n-butylbenzene	ug/kg							
n-propylbenzene	ug/kg							
p-isopropyltoluene	ug/kg							
sec-butylbenzene	ug/kg							
Styrene	ug/kg							
tert-butylbenzene	ug/kg							
Tetrachloroethene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-dichloroethene	ug/kg							
trans-1,3-dichloropropene	ug/kg							
Trichloroethene	ug/kg							
Trichlorofluoromethane	ug/kg							
Vinyl chloride	ug/kg							
Xylene (m)	ug/kg							
Xylene (o)	ug/kg							
Xylene (p)	ug/kg							
Xylene Total	ug/kg	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-trichlorobenzene	ug/kg							
1,2,4-trichlorobenzene	ug/kg							
1,2-dichlorobenzene	ug/kg							
1,3-dichlorobenzene	ug/kg							
1,4-dichlorobenzene	ug/kg							
4-methylphenol	ug/kg							
Hexachlorobutadiene	ug/kg							
Naphthalene	ug/kg							
Octamethylcyclotetrasiloxane	ug/kg							
cis-1,3-dichloropropene	ug/kg							

Notes:

1) Soil concentrations for organic contaminants that are detected at least once in the vicinity of Tree 64 (i.e., CH2-SB-16 through CH2-SB-18, SB-9S, SB-04, ESA-MW-1 through ESA-MW-3, ESA-SB-1, ESA-SB-4 through ESA-SB-9).

2) Sources of historical groundwater sampling data:

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama." Prepared for Montgomery County. August 2003.
CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.
Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.

3) U = below the analytical detection limit

4) J = estimated concentration above the analytical detection limit but below the method reporting limit

5) Bold text indicates either a) for CH2M Hill data: values that are within the calibrated range indicated by CH2M Hill or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported with or without qualifiers. Note that CH2M Hill sewer study report (CH2M Hill, 1999) states that the calibrated range of the instruments used for soil analysis was between 2 µg/kg and 160 µg/kg.

6) Gray highlighting indicates a) for CH2M Hill data: values greater than the estimated quantitation limit (EQL) of 5 µg/kg for method SW846 8260 (and revisions of this method) or b) for Black & Veatch, 2002 or EMC, 2003 data: detections reported <u>without</u> qualifiers

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	CH2-SB1 02/15/1999	CH2-SB2 02/16/1999	CH2-SB3 02/17/1999	CH2-SB4 02/16/1999	CH2-SB5 02/17/1999	CH2-SB6 02/18/1999	CH2-SB7 02/18/1999	CH2-SB8 02/19/1999	CH2-SB9 02/19/1999	CH2-SB10 02/22/1999	CH2-SB11 02/22/1999	CH2-SB12 02/23/1999	CH2-SB13 02/23/1999	CH2-SB14 02/24/1999	CH2-SB15 02/24/1999	CH2-SB16 02/26/1999	CH2-SB17 02/25/1999
1,1,2-trichloroethane	µg/L	5	0.24	1 U	1 U	1 U	1 U	1.06	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.64	1 U	1.56
1,1-dichloroethene	µg/L	7	7	2.35	4.07	1 U	1 U	2.35	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-trimethylbenzene	µg/L	N.L	15	1 U	1 U	1 U	1 U	25.9	1 U	1 U	4.21	1.75	1 U	1 U	1 U	1 U	7.35	92.5	1 U	1.24
Acetone	mg/L	N.L	22																	
Benzene	µg/L	5	0.41	1 U	1 U	1 U	1 U	1.8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3.67	30.2	1 U	1 U
Chloroform	µg/L	N.L	0.19	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.84	1 U	1 U	1 U	1 U	1.08	1.25	1.71
cis-1,2-dichloroethene	µg/L	70	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.09	1.58	1 U	1 U	1 U	1 U	1 U	17.4
Ethylbenzene	µg/L	700	1.5	1 U	1 U	1 U	1 U	8.11	1 U	1 U	1 U	2.19	1 U	1 U	1 U	1 U	6.87	56.5	1 U	1 U
Freon 113	µg/L	N.L	59000																	
Tetrachloroethene	µg/L	5	0.11	5.81	4.23	212	2.88	12.7	4.88	1 U	1 U	1 U	3.62	24.19	40.55	21.7	71.5	21.7	1 U	1 U
Trichloroethene	µg/L	5	2	1	1 U	1 U	1 U	1.24	1.2	1 U	1 U	1 U	1.21	1.41	1 U	1 U	1 U	1 U	3.16	1 U
Trichlorofluoromethane	µg/L	N.L	1300	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4.99
Xylene Total	µg/L	10000	200	1 U	1 U	1 U	1 U	13.9	1 U							1 U	35.1	313	1.27	2.6
Diethylene glycol, monobutyl ether	µg/L	N.L	1100																	
Aldrin + Dieldrin	µg/L	N.L	N.L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlordane (cis)	µg/L	2	N.L																	
Dieldrin	µg/L	N.L	0.0042	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Endrin ketone	µg/L	N.L	N.L																	
gamma-Chlordane	mg/L	0.002	0.00019																	
g-BHC (Lindane)	µg/L	0.2	0.061	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Heptachlor	µg/L	0.4	0.015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	2.32	0.2 U	3.5

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).

2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.

3) Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.

Landmeyer, et al. "Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010: U.S. Geological Survey Scientific Investigations Report 2011–5148." 2011.

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CTE Environmental (CTE). Phase I Environmental Site Assessment at the Corner of North Hull & Dexter Avenue. Prepared on behalf of Alabama State Bar Association. January 2001.

Note: "CTE-1" was collected in January 2001 by CTE from an existing "USEPA monitoring well" at the southwest corner of Monroe & Hull (likely MW-10S) during Phase I ESA.

J.M. Hall. Groundwater Sampling Report, Former Western Rails Site. Prepared for City of Montgomery. November 2006. (Former Western Rails Site was purchased by City of Montgomery from CSX Transportation)

4) U = below the analytical detection limit

5) J = estimated concentration above the analytical detection limit but below the method reporting limit

6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	CH2-SB18 02/25/1999	CSX-MW-2 09/10/2006	CSX-MW-3 09/10/2006	CSX-MW-4 09/10/2006	CSX-MW-5 09/09/2006	CSX-MW-6 09/09/2006	CSX-MW-7 09/09/2006	CSX-MW-8 09/09/2006	CSX-MW-9 09/09/2006	ESA-MW1 05/12/2003	ESA-MW2 05/13/2003	ESA-MW3 05/15/2003	MW-01 10/15/1993	MW-01 10/15/1993	MW-04 03/04/1994	MW-04 03/04/1994	MW-04 06/13/1994
1,1,2-trichloroethane	µg/L	5	0.24	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				50 U	50 U	5 U	5 U	0.5 U
1,1-dichloroethene	µg/L	7	7	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				50 U	50 U	5 U	5 U	0.9
1,2,4-trimethylbenzene	µg/L	N.L	15	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				50 U	50 U	5 U	5 U	0.5 U
Acetone	mg/L	N.L	22		0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U								
Benzene	µg/L	5	0.41	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	50 U	50 U	5 U	5 U	0.5 U
Chloroform	µg/L	N.L	0.19	1.22	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				50 U	50 U	5 U	5 U	0.5 U
cis-1,2-dichloroethene	µg/L	70	70	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				50 U	50 U	5 U	5 U	0.5 U
Ethylbenzene	µg/L	700	1.5	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	50 U	50 U	5 U	5 U	0.5 U
Freon 113	µg/L	N.L	59000																	
Tetrachloroethene	µg/L	5	0.11	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	536	607	38.8	9.7	3.7
Trichloroethene	µg/L	5	2	8.7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U				50 U	50 U	5 U	5 U	0.5 U
Trichlorofluoromethane	µg/L	N.L	1300	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U								
Xylene Total	µg/L	10000	200	2.02	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U	50 U	5 U	5 U	0.5 U
Diethylene glycol, monobutyl ether	µg/L	N.L	1100																	
Aldrin + Dieldrin	µg/L	N.L	N.L	1 U																
Chlordane (cis)	µg/L	2	N.L																	
Dieldrin	µg/L	N.L	0.0042	0.5 U																
Endrin ketone	µg/L	N.L	N.L																	
gamma-Chlordane	mg/L	0.002	0.00019																	
g-BHC (Lindane)	µg/L	0.2	0.061	0.1 U																
Heptachlor	µg/L	0.4	0.015	0.2 U																

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.
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4) U = below the analytical detection limit
5) J = estimated concentration above the analytical detection limit but below the method reporting limit
6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	IW-01 02/01/2002	IW-02 02/01/2002	MW-01I 05/04/2000	MW-01I 01/01/2001	MW-01I 05/12/2009	MW-01I 05/12/2009	MW-01I 05/11/2010	MW-01I 10/25/2011	MW-01I 10/25/2011_ EPA	MW-01S 05/05/2000	MW-01S 01/01/2001	MW-01S 05/19/2009	MW-01S 05/11/2010	MW-01S 10/25/2011	MW-01S 10/25/2011_ EPA
1,1,2-trichloroethane	µg/L	5	0.24							0.5 U	5 U	0.5 U				0.5 U	5 U	0.5 U
1,1-dichloroethene	µg/L	7	7			10 U	10 U	0.02 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	0.049 E	0.5 U	5 U	0.5 U
1,2,4-trimethylbenzene	µg/L	N.L	15							0.5 U	5 U	0.5 U				0.5 U	5 U	0.5 U
Acetone	mg/L	N.L	22	0.025 U	0.038	0.01 U				0.004 U		0.004 U	0.01 U			0.004 U		0.0005 U
Benzene	µg/L	5	0.41	1 U	1 U	10 U	10 U	0.02 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	0.016	0.5 U	5 U	4 U
Chloroform	µg/L	N.L	0.19	1 U	1 U	10 U	10 U	0.04 E	0.03 E	0.5 U	5 U	0.22 J	10 U	8 J	37.3	23	13.21	14
cis-1,2-dichloroethene	µg/L	70	70	1 U	2.7	10 U	10 U	0.02 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	0.02 U	0.5 U	5 U	0.5 U
Ethylbenzene	µg/L	700	1.5			10 U				0.5 U	5 U	0.5 U	10 U			0.5 U	5 U	0.5 U
Freon 113	µg/L	N.L	59000					0.04 U	0.04 U	0.5 U		0.5 U			0.04 U	0.5 U		0.5 U
Tetrachloroethene	µg/L	5	0.11	1 U	4.9	10 U	10 U	0.08 E	0.07 E	0.13 J	5 U	0.28 J	10 U	6 J	5.28	0.26 J	1.13	1.5
Trichloroethene	µg/L	5	2	1 U	1.2	10 U	10 U	0.02 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	0.061 E	0.5 U	5 U	0.5 U
Trichlorofluoromethane	µg/L	N.L	1300					0.08 U	0.08 U	0.5 U	5 U	0.5 U			0.08 U	0.5 U	5 U	0.5 U
Xylene Total	µg/L	10000	200			10 U	10 U			0.5 U		0.5	10 U	10 U		0.5 U		0.5
Diethylene glycol, monobutyl ether	µg/L	N.L	1100															
Aldrin + Dieldrin	µg/L	N.L	N.L			0.1 U	0.1 U						0.1 U	0.1 U				
Chlordane (cis)	µg/L	2	N.L			0.05 U							0.05 U					
Dieldrin	µg/L	N.L	0.0042			0.1 U	0.1 U						0.1 U	0.1 U				
Endrin ketone	µg/L	N.L	N.L			0.1 U							0.1 U					
gamma-Chlordane	mg/L	0.002	0.00019			0.00005 U	0.00005 U						0.000011 N	0.00005 U				
g-BHC (Lindane)	µg/L	0.2	0.061			50 U							0.05 U					
Heptachlor	µg/L	0.4	0.015															

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.
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4) U = below the analytical detection limit
5) J = estimated concentration above the analytical detection limit but below the method reporting limit
6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	MW-02S 12/06/1993	MW-02S 03/04/1994	MW-02S 03/04/1994	MW-02S 06/13/1994	MW-02S 05/04/2000	MW-02S 01/01/2001	MW-02S 07/25/2007	MW-02S 04/07/2009	MW-02S 05/11/2010	MW-02S 10/26/2011	MW-02S 10/26/2011_ EPA	MW-03S 12/06/1993	MW-03S 03/04/1994	MW-03S 03/04/1994	MW-03S 06/13/1994	MW-03S 05/04/2000	MW-03S 01/01/2001	MW-03S 07/24/2007
1,1,2-trichloroethane	µg/L	5	0.24	5 U	5 U	5 U	0.5 U			5 U		0.5 U	5 U	0.5 U	5 U	5 U	5 U	0.5 U			5 U
1,1-dichloroethene	µg/L	7	7	5 U	5 U	5 U	2.8	10 U	10 U	5 U	0.09 E	0.5 U	5 U	0.17 J	5 U	5 U	5 U	0.5 U	10 U	10 U	5 U
1,2,4-trimethylbenzene	µg/L	N.L	15	5 U	5 U	5 U	0.5 U					0.5 U	5 U	0.5 U	5 U	5 U	5 U	0.5 U			
Acetone	mg/L	N.L	22					0.01 U				0.004 U		0.004 U					0.01 U		
Benzene	µg/L	5	0.41	0.5 U	5 U	5 U	0.5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	0.5 U	10 U	10 U	5 U
Chloroform	µg/L	N.L	0.19	0.5 U	5 U	5 U	0.5 U	10 U	10 U	5 U	2.65	0.71	1.01	1.2	5 U		5 U	0.5 U	10 U	10 U	5 U
cis-1,2-dichloroethene	µg/L	70	70	0.5 U	5 U	5 U	0.5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U	5 U		5 U	0.5 U	10 U	10 U	5 U
Ethylbenzene	µg/L	700	1.5	0.5 U	5 U	5 U	0.5 U	10 U		5 U		0.5 U	5 U	0.5 U	5 U		5 U	0.5 U	10 U		5 U
Freon 113	µg/L	N.L	59000								0.04 U	0.5 U		0.5 U							
Tetrachloroethene	µg/L	5	0.11	61.7	86	93	113	37	44	24	25	45	36.5	44	18.7	65	41.9	17.2	21 J	22	57
Trichloroethene	µg/L	5	2	0.5 U	5 U	5 U	0.6	10 U	10 U	5 U	0.1	0.17 J	5 U	0.18 J	5 U		5 U	1	18 J	13	7.8
Trichlorofluoromethane	µg/L	N.L	1300							5 U	0.06 E	0.5 U	5 U	0.5 U							5 U
Xylene Total	µg/L	10000	200	0.5 U	5 U	5 U	0.5 U	10 U	10 U			0.5 U		0.5	5 U		5 U	0.5 U	10 U	10 U	
Diethylene glycol, monobutyl ether	µg/L	N.L	1100																3 J		
Aldrin + Dieldrin	µg/L	N.L	N.L					0.1 U	0.033										0.1 U	0.1 U	
Chlordane (cis)	µg/L	2	N.L					0.05 U											0.05 U		
Dieldrin	µg/L	N.L	0.0042					0.1 U	0.033 J										0.1 U	0.1 U	
Endrin ketone	µg/L	N.L	N.L					0.1 U											0.1 U		
gamma-Chlordane	mg/L	0.002	0.00019					0.00005 U	0.000009 J										0.00005 U	0.00005 U	
g-BHC (Lindane)	µg/L	0.2	0.061					0.05 U											0.05 U		
Heptachlor	µg/L	0.4	0.015																		

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).

2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.

3) Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.

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5) J = estimated concentration above the analytical detection limit but below the method reporting limit

6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	MW-04I 05/09/2000	MW-04I 01/01/2001	MW-04S 05/01/2000	MW-04S 01/01/2001	MW-04S 07/25/2007	MW-04S 04/21/2009	MW-04S 05/12/2010	MW-04S 10/26/2011	MW-04S 10/26/2011_ EPA	MW-04S 10/26/2011_ EPA	MW-05I 05/04/2000	MW-05I 01/01/2001	MW-05I 07/26/2007	MW-05I 04/08/2009	MW-05I 05/12/2010	MW-05I 05/12/2010	MW-05I 10/25/2011	MW-05I 10/25/2011_ EPA
1,1,2-trichloroethane	µg/L	5	0.24					5 U		0.5 U	5 U	0.5 U	0.5 U			5 U		0.5 U	0.5 U	5 U	0.5 U
1,1-dichloroethene	µg/L	7	7	10 U	10 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U	0.5 U	10 U	10 U	5 U	0.02 U	0.5 U	0.5 U	5 U	0.5 U
1,2,4-trimethylbenzene	µg/L	N.L	15							0.5 U	5 U	0.5 U	0.5 U					0.5 U	0.5 U	5 U	0.5 U
Acetone	mg/L	N.L	22	0.057		0.01 U				0.004 U		0.004 U	0.004 U	0.01 U				0.004 U	0.004 U		0.004 U
Benzene	µg/L	5	0.41	10 U	10 U	10 U	10 U	5 U	0.01 E	0.5 U	5 U	0.5 U	0.5 U	10 U	10 U	5 U	0.02 U	0.5 U	0.5 U	5 U	0.5 U
Chloroform	µg/L	N.L	0.19	10 U	10 U	10 U	2 J	5 U	1.96	1.4	0.56	0.66	0.67	11	10 U	5 U	0.04 U	0.5 U	0.5 U	5 U	0.5 U
cis-1,2-dichloroethene	µg/L	70	70	10 U	10 U	11	8 J	17	18.8	6.7	2.13	2.2	2.2	10 U	10 U	5 U	0.02 U	0.5 U	0.5 U	5 U	0.5 U
Ethylbenzene	µg/L	700	1.5	10 U		10 U		5 U		0.5 U	5 U	0.5 U	0.5 U	10 U		5 U		0.5 U	0.5 U	5 U	0.5 U
Freon 113	µg/L	N.L	59000						0.18	0.5 U		0.5 U	0.5 U				0.04 U	0.5 U	0.5 U		0.5 U
Tetrachloroethene	µg/L	5	0.11	10 U	10 U	55	85	120	84.8	62	34.1	38	38	10 U	5 J	5 U	7.77	14	12	17.3	20
Trichloroethene	µg/L	5	2	10 U	10 U	10	10	11	9.62	4.8	2.4	2.8	2.8	10 U	10 U	5 U	0.51	1.4	1.2	5 U	0.57
Trichlorofluoromethane	µg/L	N.L	1300					5 U	0.08 E	0.5 U	5 U	0.5 U	0.5 U			5 U	0.08 U	0.5 U	0.5 U	5 U	0.5 U
Xylene Total	µg/L	10000	200	10 U	10 U	10 U	10 U			0.5 U		0.5	0.5	10 U	10 U			0.5 U	0.5 U		0.5
Diethylene glycol, monobutyl ether	µg/L	N.L	1100											2 J							
Aldrin + Dieldrin	µg/L	N.L	N.L	0.1 U	0.1 U	0.1 U	0.1 U							0.1 U	0.1 U						
Chlordane (cis)	µg/L	2	N.L	0.05 U		0.05 U								*0.05 R*							
Dieldrin	µg/L	N.L	0.0042	0.1 U	0.1 U	0.1 U	0.1 U							*0.1 R*	0.1 U						
Endrin ketone	µg/L	N.L	N.L	0.1 U		0.1 U								*0.1 R*							
gamma-Chlordane	mg/L	0.002	0.00019	0.00005 U	0.00005 U	0.00005 U	0.000014 J							*0.00005 R*	0.00005 U						
g-BHC (Lindane)	µg/L	0.2	0.061	0.05 U		0.05 U								*0.05 R*							
Heptachlor	µg/L	0.4	0.015																		

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Sources of historical groundwater sampling data:

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5) J = estimated concentration above the analytical detection limit but below the method reporting limit
6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	MW-06S 05/02/2000	MW-06S 01/01/2001	MW-06S 07/24/2007	MW-07I 05/03/2000	MW-07I 01/01/2001	MW-07I 07/30/2007	MW-07I 04/09/2009	MW-07I 05/11/2010	MW-07I 10/25/2011	MW-07I 10/25/2011_ EPA	MW-07S 05/03/2000	MW-07S 01/01/2001	MW-07S 07/30/2007	MW-07S 04/09/2009	MW-07S 05/11/2010	MW-07S 10/25/2011	MW-07S 10/25/2011_E PA
1,1,2-trichloroethane	µg/L	5	0.24			5 U			5 U		0.5 U	5 U	0.5 U			5 U		0.5 U	5 U	0.5 U
1,1-dichloroethene	µg/L	7	7	10 U	10 U	5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U
1,2,4-trimethylbenzene	µg/L	N.L	15								0.5 U	5 U	0.5 U					0.5 U	5 U	0.5 U
Acetone	mg/L	N.L	22	0.01 U			0.01 J				0.004 U		0.004 U	0.021 J				0.004 U		0.004 U
Benzene	µg/L	5	0.41	10 U	10 U	5 U	10 U	10 U		0.02 U	0.5 U	5 U	0.5 U	10 U	10 U		0.02 U	0.5 U	5 U	0.5 U
Chloroform	µg/L	N.L	0.19	10 U	10 U	5 U	10 U	10 U	5 U	1.28	0.5 U	5 U	0.22 J	10 U	10 U	5 U	0.04 U	0.38 J	5 U	0.5 U
cis-1,2-dichloroethene	µg/L	70	70	10 U	10 U	5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U
Ethylbenzene	µg/L	700	1.5	10 U		5 U	10 U		5 U		0.5 U	5 U	0.5 U	10 U		5 U		0.5 U	5 U	0.5 U
Freon 113	µg/L	N.L	59000							0.04 U	0.5 U		0.5 U				0.04 U	0.5 U		0.5 U
Tetrachloroethene	µg/L	5	0.11	10 U	10 U	5 U	10 U	10 U	5 U	0.06 E	0.19 J	1.84	2.1	10 U	10 U	5 U	0.07 E	0.57	5 U	0.5 U
Trichloroethene	µg/L	5	2	10 U	10 U	5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	5 U	0.02	0.5 U	5 U	0.5 U
Trichlorofluoromethane	µg/L	N.L	1300			5 U			5 U	0.08 U	0.5 U	5 U	0.5 U			5 U	0.08 U	0.5 U	5 U	0.5 U
Xylene Total	µg/L	10000	200	10 U	10 U		10 U	10 U			0.5 U		0.5	10 U	10 U			0.5 U		0.5
Diethylene glycol, monobutyl ether	µg/L	N.L	1100	3 J																
Aldrin + Dieldrin	µg/L	N.L	N.L	0.005 U	0.1 U		0.1 U	0.1 U						0.1 U	0.1 U					
Chlordane (cis)	µg/L	2	N.L	0.05 U			0.05 U							0.05 U						
Dieldrin	µg/L	N.L	0.0042	0.005 U	0.1 U		0.1 U	0.1 U						0.1 U	0.1 U					
Endrin ketone	µg/L	N.L	N.L	0.1 U			0.1 U							0.1 U						
gamma-Chlordane	mg/L	0.002	0.00019	0.00005 U	0.00005 U		0.00005 U	0.00005 U						0.00005 U	0.00005 U					
g-BHC (Lindane)	µg/L	0.2	0.061	0.05 U			0.05 U							0.05 U						
Heptachlor	µg/L	0.4	0.015																	

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
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Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	MW-08I 05/03/2000	MW-08I 01/01/2001	MW-08I 04/21/2009	MW-08I 05/11/2010	MW-08I 10/25/2011_EPA	MW-08I 10/25/2011	MW-08S 05/03/2000	MW-08S 01/01/2001	MW-08S 07/24/2007	MW-08S 04/20/2009	MW-08S 05/11/2010	MW-08S 10/25/2011	MW-08S 10/25/2011_EPA
1,1,2-trichloroethane	µg/L	5	0.24				0.5 U	0.5 U	5 U			5 U		0.5 U	5 U	0.5 U
1,1-dichloroethene	µg/L	7	7	10 U	10 U	0.02 U	0.5 U	0.5 U	5 U	4 J	6 J	5 U	1.68	1.5	5 U	0.32 J
1,2,4-trimethylbenzene	µg/L	N.L	15				0.5 U	0.5 U	5 U					0.5 U	5 U	0.5 U
Acetone	mg/L	N.L	22	0.01 U			0.004 U	0.004 U		0.01 U				0.004 U		0.004 U
Benzene	µg/L	5	0.41	10 U	10 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U
Chloroform	µg/L	N.L	0.19	10 U	10 U	0.04 U	0.5 U	0.5 U	5 U	10 U	10 U	5 U	0.6	0.51	5 U	0.41 J
cis-1,2-dichloroethene	µg/L	70	70	10 U	10 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U	5 U	0.02 U	0.5 U	5 U	0.5 U
Ethylbenzene	µg/L	700	1.5	10 U			0.5 U	0.5 U	5 U	10 U		5 U		0.5 U	5 U	0.5 U
Freon 113	µg/L	N.L	59000			0.04 U	0.5 U	0.5 U					0.04 U	0.5 U		0.5 U
Tetrachloroethene	µg/L	5	0.11	10 U	10 U	0.01 E	0.5 U	0.5 U	5 U	85 J	26	51	18.8	22	52.1	55
Trichloroethene	µg/L	5	2	10 U	10 U	0.02 U	0.5 U	0.5 U	5 U	1 J	10 U	5 U	0.51	0.54	0.6	0.72
Trichlorofluoromethane	µg/L	N.L	1300			0.08 U	0.5 U	0.5 U	5 U			5 U	0.25	0.26 J	5 U	0.23 J
Xylene Total	µg/L	10000	200	10 U	10 U		0.5 U	0.5		10 U	10 U			0.5 U		0.5
Diethylene glycol, monobutyl ether	µg/L	N.L	1100													
Aldrin + Dieldrin	µg/L	N.L	N.L	0.1 U	0.1 U					0.1 U	0.1 U					
Chlordane (cis)	µg/L	2	N.L	0.05 U						0.005 U						
Dieldrin	µg/L	N.L	0.0042	0.1 U	0.1 U					0.1 U	0.1 U					
Endrin ketone	µg/L	N.L	N.L	0.1 U						0.1 U						
gamma-Chlordane	mg/L	0.002	0.00019	0.000005 U	0.00005 U					0.00005 U	0.00005 U					
g-BHC (Lindane)	µg/L	0.2	0.061	0.05 U						0.05 U						
Heptachlor	µg/L	0.4	0.015													

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Sources of historical groundwater sampling data:

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4) U = below the analytical detection limit
5) J = estimated concentration above the analytical detection limit but below the method reporting limit
6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	MW-09S 05/01/2000	MW-09S 01/01/2001	MW-09S 07/26/2007	MW-09S 04/27/2009	MW-09S 05/12/2010	MW-09S 10/26/2011_EPA	MW-09S 10/26/2011	MW-10S 05/02/2000	MW-10S 01/01/2001	CTE-1 01/10/2001	MW-10S 07/26/2007	MW-10S 04/27/2009	MW-10S 05/12/2010	MW-10S 10/26/2011_EPA	MW-10S 10/26/2011	MW-11I 05/08/2000	MW-11I 01/01/2001
1,1,2-trichloroethane	µg/L	5	0.24			5 U		0.5 U	0.5 U	5 U				5 U		0.5 U	0.5 U	5 U		
1,1-dichloroethene	µg/L	7	7	10 U	10 U	5 U	0.13	0.5 U	0.5 U	5 U	10 U	10 U		5 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U
1,2,4-trimethylbenzene	µg/L	N.L	15					0.5 U	0.5 U	5 U						0.5 U	0.5 U	5 U		
Acetone	mg/L	N.L	22	0.025 J				0.004 U	0.004 U		0.01 U					0.004 U	0.004 U		0.01 U	
Benzene	µg/L	5	0.41	10 U	10 U	5 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U	1 U	5 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U
Chloroform	µg/L	N.L	0.19	10 U	10 U	5 U	2.98	1.1	1.2	1.1	10 U	10 U		5 U	1.01	1.2	0.88	0.81	11	10 U
cis-1,2-dichloroethene	µg/L	70	70	10 U	10 U	5 U	0.02 E	0.5 U	0.5 U	5 U	10 U	10 U		5 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U
Ethylbenzene	µg/L	700	1.5			5 U		0.5 U	0.5 U	5 U			1 U	5 U		0.5 U	0.5 U	5 U	10 U	
Freon 113	µg/L	N.L	59000				0.07 E	0.5 U	0.5 U						0.04 U	0.5 U	0.5 U			
Tetrachloroethene	µg/L	5	0.11	10 U	10 U	5 U	0.03 E	0.5 U	0.5 U	5 U	10 U	10 U	1 U	5 U	0.07 E	0.5 U	0.5 U	5 U	10 U	10 U
Trichloroethene	µg/L	5	2	10 U	2 J	5 U	0.03 E	3.5	2.1	1.63	10 U	10 U		5 U	0.02 U	0.5 U	0.5 U	5 U	10 U	10 U
Trichlorofluoromethane	µg/L	N.L	1300			5 U	0.07 E	0.5 U	0.5 U	5 U				5 U	0.08 U	0.5 U	0.5 U	5 U		
Xylene Total	µg/L	10000	200	10 U	10 U			0.5 U	0.5		10 U	10 U	5 U			0.5 U	0.5		10 U	10 U
Diethylene glycol, monobutyl ether	µg/L	N.L	1100	7 J							7 J									
Aldrin + Dieldrin	µg/L	N.L	N.L	0.019	0.38						0.1 U	0.1 U							0.1 U	0.1 U
Chlordane (cis)	µg/L	2	N.L	0.01 J							0.05 U								0.05 U	
Dieldrin	µg/L	N.L	0.0042	0.019 J	0.38 J						0.1 U	0.1 U							0.1 U	0.1 U
Endrin ketone	µg/L	N.L	N.L	0.029 J							0.1 U								0.1 U	
gamma-Chlordane	mg/L	0.002	0.00019	0.000006 J	0.00005 U						0.00005 U	0.00005 U							0.00005 U	0.00005 U
g-BHC (Lindane)	µg/L	0.2	0.061	0.039 J							0.05 U								0.05 U	
Heptachlor	µg/L	0.4	0.015																	

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).

2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.

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6) E = estimated concentration

Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	MW-11S 05/08/2000	MW-11S 01/01/2001	MW-12I 02/01/2002	MW-12I 04/22/2009	MW-12I 05/10/2010	MW-12I 10/24/2011_ EPA	MW-12I 10/24/2011	MW-12S 02/01/2002	MW-12S 07/30/2007	MW-12S 04/23/2009	MW-12S 05/10/2010	MW-12S 10/24/2011	MW-12S 10/24/2011_ EPA	PW-05 05/09/2000	PW-05 01/01/2001	PW-08 05/09/2000	PW-08 01/01/2001
1,1,2-trichloroethane	µg/L	5	0.24					0.5 U	0.5 U	5 U		5 U		0.13 J	5 U	0.5 U				
1,1-dichloroethene	µg/L	7	7	10 U	20 U		0.02 U	0.5 U	0.5 U	5 U		5 U	0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	10 U	10 U
1,2,4-trimethylbenzene	µg/L	N.L	15	11 J				0.5 U	0.5 U	5 U				0.5 U	5 U	0.5 U				
Acetone	mg/L	N.L	22	0.01 U		0.025 U		0.004 U	0.004 U		0.05 U			0.004 U		0.004 U	0.01 U		0.01 U	
Benzene	µg/L	5	0.41	490 J	290	2.8	0.02 U	0.5 U	0.5 U	5 U	2 U		0.02 U	0.5 U	5 U	0.5 U	10 U	10 U	10 U	10 U
Chloroform	µg/L	N.L	0.19	10 U	2 J	33	0.04 U	0.5 U	0.5 U	5 U	2 U	5 U	0.71	0.65	0.55	0.68	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	µg/L	70	70	10 U	20 U	1 U	0.02 U	0.5 U	0.5 U	5 U	1 J	5 U	0.18	1.2	5 U	0.48 J	10 U	10 U	10 U	10 U
Ethylbenzene	µg/L	700	1.5	41				0.5 U	0.5 U	5 U		5 U		0.5 U	5 U	0.5 U	10 U		10 U	
Freon 113	µg/L	N.L	59000				0.04 U	0.5 U	0.5 U				0.08 E	0.5 U		0.5 U				
Tetrachloroethene	µg/L	5	0.11	10 U	20 U	1.8	0.01 E	0.5 U	0.5 U	5 U	240	300	63.8	270	109.5	120	10 U	10 U	10 U	10 U
Trichloroethene	µg/L	5	2	10 U	20 U	1 U	0.02 E	0.5 U	0.5 U	5 U	2 U	5 U	0.24	1.2	0.61	0.64	10 U	10 U	10 U	10 U
Trichlorofluoromethane	µg/L	N.L	1300				0.08 U	0.5 U	0.5 U	5 U		5 U	0.08 U	0.18 J	5 U	0.21 J				
Xylene Total	µg/L	10000	200	33	17 J			0.5 U	0.5					0.5 U		0.5	10 U	10 U	10 U	10 U
Diethylene glycol, monobutyl ether	µg/L	N.L	1100																	
Aldrin + Dieldrin	µg/L	N.L	N.L	0.1 U	0.1 U												0.1 U	10 U	0.1 U	0.1 U
Chlordane (cis)	µg/L	2	N.L	0.05 U													0.05 U		0.05 U	
Dieldrin	µg/L	N.L	0.0042	0.1 U	0.1 U												0.1 U	10 U	0.1 U	0.1 U
Endrin ketone	µg/L	N.L	N.L	0.1 U													0.1 U		0.1 U	
gamma-Chlordane	mg/L	0.002	0.00019	0.00005 U	0.00005 U												0.00005 U	0.00005 U	0.00005 U	0.00005 U
g-BHC (Lindane)	µg/L	0.2	0.061	0.05 U													0.05 U		0.05 U	
Heptachlor	µg/L	0.4	0.015																	

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).

2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.

3) Sources of historical groundwater sampling data:

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Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	PW-09W 04/14/1991	PW-09W 05/14/1992	PW-09W 06/13/1994	PW-09W 05/09/2000	PW-09W 05/22/2000	PW-09W 07/18/2000	PW-09W 01/01/2001	PW-09W 04/08/2002	PW-09W 05/01/2002	PW-09W 04/21/2003	PW-09W 06/07/2004	PW-09W 04/20/2005	PW-09W 04/27/2006	PW-09W 06/26/2007	PW-09W 04/15/2008	PW-09W 04/21/2009	PW-09W 09/15/2009
1,1,2-trichloroethane	µg/L	5	0.24			0.5 U		0.5 U			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-dichloroethene	µg/L	7	7			0.5 U	10 U	0.5 U		10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-trimethylbenzene	µg/L	N.L	15			0.5 U		0.5 U			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	mg/L	N.L	22				0.01 U													
Benzene	µg/L	5	0.41			0.5 U	10 U	0.5 U		10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	N.L	0.19			0.5 U	10 U	0.5 U		10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-dichloroethene	µg/L	70	70			0.5 U	10 U	0.5 U		10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	700	1.5			0.5 U	10 U	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Freon 113	µg/L	N.L	59000																	
Tetrachloroethene	µg/L	5	0.11	7.1	21	0.5 U	10 U	0.5 U		10 U	0.5 U	1.26	43.1	40.7	55.9	36.2	39.9	0.5 U	161	49.5
Trichloroethene	µg/L	5	2			0.5 U	10 U	0.5 U		10 U	1.62	0.765	2.69	1.54	1.08	0.94	0.84	0.92	0.71	0.59
Trichlorofluoromethane	µg/L	N.L	1300					1.09			0.586	0.659	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene Total	µg/L	10000	200			0.5 U	10 U	1.5 U		10 U	1.5 U	1.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Diethylene glycol, monobutyl ether	µg/L	N.L	1100																	
Aldrin + Dieldrin	µg/L	N.L	N.L				0.1 U		1 U	0.1 U										
Chlordane (cis)	µg/L	2	N.L				0.05 U													
Dieldrin	µg/L	N.L	0.0042				0.1 U		0.5 U	0.1 U										
Endrin ketone	µg/L	N.L	N.L				0.1 U													
gamma-Chlordane	mg/L	0.002	0.00019				0.00005 U			0.00005 U										
g-BHC (Lindane)	µg/L	0.2	0.061				0.05 U		0.1 U											
Heptachlor	µg/L	0.4	0.015						0.2 U											

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
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Table 2-2. Historical Groundwater Sampling Results for Organic Contaminants Detected in the Vicinity of Tree 64
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	TW-01 01/01/2001	TW-02 01/01/2001	TW-03 01/01/2001	TW-04 01/01/2001	TW-05 01/01/2001	TW-06 01/01/2001	TW-07 01/01/2001	TW-08 01/01/2001	TW-09 01/01/2001	TW-10 01/01/2001	TW-11 01/01/2001	TW-12 01/01/2001	TW-13 01/01/2001	TW-13 01/01/2001	TW-14 02/01/2002	TW-15 02/01/2002	TW-16 02/01/2002
1,1,2-trichloroethane	µg/L	5	0.24																	
1,1-dichloroethene	µg/L	7	7	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	20 U	20 U			
1,2,4-trimethylbenzene	µg/L	N.L	15									120 J								
Acetone	mg/L	N.L	22	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.5 U	0.01 U	0.01 U	0.01 U	0.02 U	0.02 U	0.025 U	0.063 U	0.025 U
Benzene	µg/L	5	0.41	10 U	10 U	10 U	10 U	150	10 U	10 U	3 J	4500	10 U	10 U	10 U	20 U	20 U	1 U	1 U	1 U
Chloroform	µg/L	N.L	0.19	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	20 U	20 U	19	13	8.5 J
cis-1,2-dichloroethene	µg/L	70	70															1 U	1 U	1 U
Ethylbenzene	µg/L	700	1.5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	780	10 U	58	10 U	20 U	20 U			
Freon 113	µg/L	N.L	59000																	
Tetrachloroethene	µg/L	5	0.11	2 J	26	10 U	10 U	5 J	10 U	39	31	500 U	10 U	10 U	10 U	300	340	29	1 U	24 J
Trichloroethene	µg/L	5	2	2 J	10 U	10 U	10 U	1 J	7 J	6 J	10 U	500 U	10 U	10 U	10 U	20 U	20 U	1 U	1 U	0.52 J
Trichlorofluoromethane	µg/L	N.L	1300	10 U	10 U	10 U	2 J	10 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	20 U	20 U			
Xylene Total	µg/L	10000	200	10 U	10 U	10 U	10 U	33	10 U	10 U	10 U	2300	10 U	22	10 U	20 U	20 U			
Diethylene glycol, monobutyl ether	µg/L	N.L	1100																	
Aldrin + Dieldrin	µg/L	N.L	N.L	0.1 U	0.1 U	0.21	0.045	0.1 U	0.1 U	0.1 U	0.1 U	0.025	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U			
Chlordane (cis)	µg/L	2	N.L																	
Dieldrin	µg/L	N.L	0.0042	0.1 U	0.1 U	0.21	0.045 J	0.1 U	0.1 U	0.1 U	0.1 U	0.025 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U			
Endrin ketone	µg/L	N.L	N.L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U			
gamma-Chlordane	mg/L	0.002	0.00019	0.00005 U	0.00005 U	0.00018	0.000012 J	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U			
g-BHC (Lindane)	µg/L	0.2	0.061	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			
Heptachlor	µg/L	0.4	0.015																	

Notes:

1) Groundwater concentrations at Capitol City Plume Superfund Site, for organic contaminants that are detected at least once in the vicinity of Tree 64 (CH2-SB-16 through CH2-SB-18, MW-9S, TW-04, ESA-MW-1 through ESA-MW-3).
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.
Landmeyer, et al. "Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010: U.S. Geological Survey Scientific Investigations Report 2011–5148." 2011.
J.M. Hall. Letter to United States Environmental Protection Agency regarding "Capitol City Plume Groundwater Monitoring." Prepared for the City of Montgomery. August 2007.
EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama 36104." Prepared for Montgomery County Commission. August 2003.
Cousins, Ashley of ACESS, LLC. Email to Geosyntec Consultants, Latham Watkins, and State of Alabama regarding MWWSS Board split samples from October 2011. Sent 20 December 2011.
CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.
Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.
CTE Environmental (CTE). Phase I Environmental Site Assessment at the Corner of North Hull & Dexter Avenue. Prepared on behalf of Alabama State Bar Association. January 2001.
Note: "CTE-1" was collected in January 2001 by CTE from an existing "USEPA monitoring well" at the southwest corner of Monroe & Hull (likely MW-10S) during Phase I ESA.
J.M. Hall. Groundwater Sampling Report, Former Western Rails Site. Prepared for City of Montgomery. November 2006. (Former Western Rails Site was purchased by City of Montgomery from CSX Transportation)

4) U = below the analytical detection limit
5) J = estimated concentration above the analytical detection limit but below the method reporting limit
6) E = estimated concentration

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5171 07/07/1999	5171 07/09/1999	5171 07/12/1999	5171 07/14/1999	5171 07/16/1999	5171 07/19/1999	5171 07/21/1999	5173 07/07/1999	5173 07/09/1999	5173 07/12/1999	5173 07/14/1999	5173 07/16/1999	5173 07/19/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072									1.48				
1,2,4-trimethylbenzene	µg/L	N.L.	15									1.89				
1,3,5-trimethylbenzene	µg/L	N.L.	370													
Bromochloromethane	µg/L	N.L.	83													
Bromodichloromethane	µg/L	N.L.	0.12		1.36		1.14			1.35		1.07				
Bromoform	µg/L	N.L.	8.5													
Chlorodibromomethane	µg/L	N.L.	0.15													
Chloroform	µg/L	N.L.	0.19	2.53	8.49	5.51	4.76	4.24	2.46	9.64	2.4	10.2	6.52	4.36	4.27	2.44
p-isopropyltoluene	µg/L	N.L.	N.L.			2.04		3.06			5.11	194.1	6.02	12.1	1.99	1.55
Tetrachloroethene	µg/L	5	0.11													
Toluene	µg/L	1000	1000	1.63		2.48		2.04			1.84	13.6	1.44	1.92	1.31	
Trichloroethene	µg/L	5	2													
1,3-dichlorobenzene	µg/L	N.L.	N.L.													
1,4-dichlorobenzene	µg/L	75	0.43		7.46	7.04	8.72	11.2	10.3	8.86		5.43	9.02	10.9	9.09	7.99
Benzo(a) pyrene	µg/L	0.2	0.0029											4.63		
Naphthalene	µg/L	N.L.	0.14													
Di(2-ethylhexyl)adipate	µg/L	N.L.	56	5.76												
g-BHC (Lindane)	µg/L	0.2	0.061													

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5174 07/07/1999	5174 07/09/1999	5174 07/12/1999	5174 07/14/1999	5174 07/16/1999	5174 07/19/1999	5174 07/21/1999	5178 07/07/1999	5178 07/09/1999	5178 07/12/1999	5178 07/14/1999	5178 07/16/1999	5178 07/19/1999	5178 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072														
1,2,4-trimethylbenzene	µg/L	N.L.	15														
1,3,5-trimethylbenzene	µg/L	N.L.	370														
Bromochloromethane	µg/L	N.L.	83														
Bromodichloromethane	µg/L	N.L.	0.12		1.38	1.39				1.43		1.38	1.39				1.43
Bromoform	µg/L	N.L.	8.5														
Chlorodibromomethane	µg/L	N.L.	0.15														
Chloroform	µg/L	N.L.	0.19	1.79	7.23	7.25	6.17	4.76	6.55	7.67	1.79	7.23	7.25	6.17	4.76	6.55	7.67
p-isopropyltoluene	µg/L	N.L.	N.L.		1.45	1.07			1.09			1.45	1.07			1.09	
Tetrachloroethene	µg/L	5	0.11														
Toluene	µg/L	1000	1000		2.39	1.02	2.19	2.52	1.71	1.32		2.39	1.02	2.19	2.52	1.71	1.32
Trichloroethene	µg/L	5	2														
1,3-dichlorobenzene	µg/L	N.L.	N.L.														
1,4-dichlorobenzene	µg/L	75	0.43		8.8	7.03	10.9	6.72	7.48	5.96		8.8	7.03	10.9	6.72	7.48	5.96
Benzo(a) pyrene	µg/L	0.2	0.0029														
Naphthalene	µg/L	N.L.	0.14														
Di(2-ethylhexyl)adipate	µg/L	N.L.	56														
g-BHC (Lindane)	µg/L	0.2	0.061														

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5180 07/07/1999	5180 07/09/1999	5180 07/12/1999	5180 07/14/1999	5180 07/16/1999	5180 07/19/1999	5180 07/21/1999	5185 07/07/1999	5185 07/09/1999	5185 07/12/1999	5185 07/14/1999	5185 07/16/1999	5185 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072													
1,2,4-trimethylbenzene	µg/L	N.L.	15			1.24	7.62							1.51		
1,3,5-trimethylbenzene	µg/L	N.L.	370				3.28									
Bromochloromethane	µg/L	N.L.	83													
Bromodichloromethane	µg/L	N.L.	0.12			1.75		1.29		1.78						2.02
Bromoform	µg/L	N.L.	8.5													
Chlorodibromomethane	µg/L	N.L.	0.15					1.01								
Chloroform	µg/L	N.L.	0.19	1.18	1.86	8.15	2.62	4.67	1.05	9.27	1.23	1.39	1.38	2.84	1.19	9.95
p-isopropyltoluene	µg/L	N.L.	N.L.													
Tetrachloroethene	µg/L	5	0.11	1.07						1.11						
Toluene	µg/L	1000	1000													
Trichloroethene	µg/L	5	2													
1,3-dichlorobenzene	µg/L	N.L.	N.L.													
1,4-dichlorobenzene	µg/L	75	0.43				1.04			4.09				1.45		4.12
Benzo(a) pyrene	µg/L	0.2	0.0029													
Naphthalene	µg/L	N.L.	0.14													
Di(2-ethylhexyl)adipate	µg/L	N.L.	56													
g-BHC (Lindane)	µg/L	0.2	0.061													

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5190 07/07/1999	5190 07/09/1999	5190 07/12/1999	5190 07/14/1999	5190 07/16/1999	5190 07/19/1999	5190 07/21/1999	5219 07/07/1999	5219 07/09/1999	5219 07/12/1999	5219 07/16/1999	5219 07/19/1999	5219 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072													
1,2,4-trimethylbenzene	µg/L	N.L.	15		0 U	2.05	1.55	1.27	1.49							
1,3,5-trimethylbenzene	µg/L	N.L.	370				1.24									
Bromochloromethane	µg/L	N.L.	83													
Bromodichloromethane	µg/L	N.L.	0.12		1.34	2.47		1.86		2.51		1.2				1.21
Bromoform	µg/L	N.L.	8.5									1.32				
Chlorodibromomethane	µg/L	N.L.	0.15					1.23				1.13				
Chloroform	µg/L	N.L.	0.19	1.35	6.18	12.7	3.86	7.52	2.01	12.7		4.37	1.73	1.41		6.08
p-isopropyltoluene	µg/L	N.L.	N.L.													2.35
Tetrachloroethene	µg/L	5	0.11								1.01		1.25			2.61
Toluene	µg/L	1000	1000													
Trichloroethene	µg/L	5	2													
1,3-dichlorobenzene	µg/L	N.L.	N.L.													
1,4-dichlorobenzene	µg/L	75	0.43				1.56			1.87			1.74		7.39	
Benzo(a) pyrene	µg/L	0.2	0.0029													
Naphthalene	µg/L	N.L.	0.14													
Di(2-ethylhexyl)adipate	µg/L	N.L.	56													
g-BHC (Lindane)	µg/L	0.2	0.061						1.71							

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5228 07/07/1999	5228 07/09/1999	5228 07/12/1999	5228 07/14/1999	5228 07/16/1999	5228 07/19/1999	5228 07/21/1999	5231 07/07/1999	5231 07/14/1999	5231 07/21/1999	5233 07/09/1999	5233 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072												
1,2,4-trimethylbenzene	µg/L	N.L.	15												
1,3,5-trimethylbenzene	µg/L	N.L.	370												
Bromochloromethane	µg/L	N.L.	83												
Bromodichloromethane	µg/L	N.L.	0.12		1.6	1.04				1.34					
Bromoform	µg/L	N.L.	8.5		1.46										
Chlorodibromomethane	µg/L	N.L.	0.15		1.3										
Chloroform	µg/L	N.L.	0.19	1.19	5.99	13.4	5.04	1.61	1.52	5.93		1.57	1.6		1.86
p-isopropyltoluene	µg/L	N.L.	N.L.	2.48		5	6.49								
Tetrachloroethene	µg/L	5	0.11		1.2				10.1	3.36					
Toluene	µg/L	1000	1000									12.2			
Trichloroethene	µg/L	5	2												
1,3-dichlorobenzene	µg/L	N.L.	N.L.												
1,4-dichlorobenzene	µg/L	75	0.43											2.19	
Benzo(a) pyrene	µg/L	0.2	0.0029												
Naphthalene	µg/L	N.L.	0.14												
Di(2-ethylhexyl)adipate	µg/L	N.L.	56												
g-BHC (Lindane)	µg/L	0.2	0.061	0.181							0.175				

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5237 07/09/1999	5237 07/12/1999	5237 07/14/1999	5237 07/16/1999	5237 07/19/1999	5237 07/21/1999	5237A 07/09/1999	5237A 07/12/1999	5237A 07/14/1999	5237A 07/16/1999	5237A 07/19/1999	5237A 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072												
1,2,4-trimethylbenzene	µg/L	N.L.	15												
1,3,5-trimethylbenzene	µg/L	N.L.	370												
Bromochloromethane	µg/L	N.L.	83												
Bromodichloromethane	µg/L	N.L.	0.12	1.4					1.36	1.91					1.83
Bromoform	µg/L	N.L.	8.5	2.17				1.1		1.35					
Chlorodibromomethane	µg/L	N.L.	0.15	1.86				1.33		1.42					1.12
Chloroform	µg/L	N.L.	0.19	3.3	1.45	1.05	2.14	1.2	6.31	7.94	2.98	1.3	2.46		7.62
p-isopropyltoluene	µg/L	N.L.	N.L.												
Tetrachloroethene	µg/L	5	0.11								2.88	2.16	2.37	3.88	3.69
Toluene	µg/L	1000	1000												
Trichloroethene	µg/L	5	2												
1,3-dichlorobenzene	µg/L	N.L.	N.L.												
1,4-dichlorobenzene	µg/L	75	0.43												
Benzo(a) pyrene	µg/L	0.2	0.0029												
Naphthalene	µg/L	N.L.	0.14												
Di(2-ethylhexyl)adipate	µg/L	N.L.	56												
g-BHC (Lindane)	µg/L	0.2	0.061												

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limi
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	5240 07/07/1999	5240 07/09/1999	5240 07/12/1999	5240 07/14/1999	5253 07/09/1999	5253 07/12/1999	5253 07/14/1999	5253 07/16/1999	5253 07/19/1999	5253 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072										
1,2,4-trimethylbenzene	µg/L	N.L.	15										
1,3,5-trimethylbenzene	µg/L	N.L.	370										
Bromochloromethane	µg/L	N.L.	83										
Bromodichloromethane	µg/L	N.L.	0.12					2.21					2.11
Bromoform	µg/L	N.L.	8.5					1.74				1.01	
Chlorodibromomethane	µg/L	N.L.	0.15					1.53					1.21
Chloroform	µg/L	N.L.	0.19				1.35	8.88	3.79	1.65	2.67	1.07	8.76
p-isopropyltoluene	µg/L	N.L.	N.L.			2.03							
Tetrachloroethene	µg/L	5	0.11							1.28		1.08	
Toluene	µg/L	1000	1000										
Trichloroethene	µg/L	5	2	1.52	1.36								
1,3-dichlorobenzene	µg/L	N.L.	N.L.										
1,4-dichlorobenzene	µg/L	75	0.43										
Benzo(a) pyrene	µg/L	0.2	0.0029										
Naphthalene	µg/L	N.L.	0.14										
Di(2-ethylhexyl)adipate	µg/L	N.L.	56										
g-BHC (Lindane)	µg/L	0.2	0.061										

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration g
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-1. Sanitary Sewer Concentrations Reported by CH2M Hill (1999)
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	Primary MCL	EPA Screening Value	95A 07/07/1999	95A 07/09/1999	95A 07/12/1999	95A 07/14/1999	95A 07/16/1999	95A 07/19/1999	95A 07/21/1999	96 07/07/1999	96 07/09/1999	96 07/12/1999	96 07/14/1999	96 07/16/1999	96 07/19/1999	96 07/21/1999
1,2,3-trichloropropane	µg/L	N.L.	0.00072														
1,2,4-trimethylbenzene	µg/L	N.L.	15		1.1												
1,3,5-trimethylbenzene	µg/L	N.L.	370														
Bromochloromethane	µg/L	N.L.	83							1.8							
Bromodichloromethane	µg/L	N.L.	0.12							1.12			1.1				1.45
Bromoform	µg/L	N.L.	8.5														
Chlorodibromomethane	µg/L	N.L.	0.15														
Chloroform	µg/L	N.L.	0.19	1.65	5.13	5.31	5.99	4.63	2.61	8.71	2.83	7.2	6.24	3.23	5.99	9	8.24
p-isopropyltoluene	µg/L	N.L.	N.L.									2.2	1.67		1.09		
Tetrachloroethene	µg/L	5	0.11				23.6								3.47		
Toluene	µg/L	1000	1000	1.06	2.11	1.9	1.57	1.51				2.84	2.9	2.36	2.93		
Trichloroethene	µg/L	5	2												6.98	2.15	
1,3-dichlorobenzene	µg/L	N.L.	N.L.									4.13					
1,4-dichlorobenzene	µg/L	75	0.43		6.86	6.77	6.4	7.13	8.47	7.91		3.94	6.27	7.17	5.75	4.92	5.43
Benzo(a) pyrene	µg/L	0.2	0.0029														
Naphthalene	µg/L	N.L.	0.14									1.53					
Di(2-ethylhexyl)adipate	µg/L	N.L.	56														
g-BHC (Lindane)	µg/L	0.2	0.061														

1) Sanitary Sewer water concentrations at Capitol City Plume Superfund Site. Manholes 5233, 5231, and 5240 are located in the vicinity of Tree 64.
2) Red highlighting indicates an exceedance of the respective SDWA MCL; Orange highlighting indicates an exceedance of the U.S. EPA Screening Value; light tan highlighting indicates a concentration greater than the detection limit.
3) Source: CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Table 3-2. Summary of Historical Groundwater Quality Measurements
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	CSX-MW-2 09/01/2006	CSX-MW-3 09/01/2006	CSX-MW-4 09/01/2006	CSX-MW-5 09/01/2006	CSX-MW-6 09/01/2006	CSX-MW-7 09/01/2006	CSX-MW-8 09/01/2006	IW-01 02/11/2002	IW-02 02/12/2002	MW-01I 05/04/2000	MW-01I 01/20/2001	MW-01I 05/12/2009	MW-01I 10/25/2011_ EPA	MW-01S 05/05/2000	MW-01S 01/20/2001	MW-01S 05/19/2009	MW-01S 10/25/2011_ EPA
Ferrous Iron	mg/L								0 U	0 U	0.35	0.5 U	0.01		0.92	0.5 U	0.01	
Dissolved Oxygen	mg/L	0.1	2.9	2.4	2.4	0.8	3.1	5.4	2.98	1.25	9.91	3.48	4.4	4.11	9.13	4.38	5	5.21
ORP	mV								0 U	0 U	164	260		235	166	262		258.9
pH	pH_Units	4.8	4.6	5	4.8	4.7	5.3	4.5			6.14		7.7	5.66	5.37		7.3	5.08
Specific Conductance	uS/cm								57	186	78	55	64	59	167	207	266	235.1
Temp	degrees C	21.5	23	23.3	22.3	22.8	21.7	21.5	11.6	14.6	21.6	19.9	20.8		21.8	22	22.3	
Turbidity	NTU	69	75	54	26	35	290	33	2	355	24	2	3.61	1.24	2.2	1	0.43	1.16

Analyte	Units	MW-02S 05/04/2000	MW-02S 01/18/2001	MW-02S 07/25/2007	MW-02S 04/07/2009	MW-02S 10/26/2011_ EPA	MW-03S 05/04/2000	MW-03S 01/17/2001	MW-03S 07/24/2007	MW-04I 05/09/2000	MW-04I 01/18/2001	MW-04I 02/12/2002	MW-04S 05/09/2000	MW-04S 01/18/2001	MW-04S 02/12/2002	MW-04S 07/25/2007	MW-04S 04/21/2009	MW-04S 10/26/2011_ EPA
Ferrous Iron	mg/L	0.77	0.5 U		0.05		0.63	0.5 U		1.49	2	0 U	0.25	0.5 U	0 U	0.46	0.01	
Dissolved Oxygen	mg/L	9.92	5.86	6.2	6.3	5.84	10.8	238	11	9.81	2.93	3.1	9.72	3.93	2.3	3.6	6.4	3.46
ORP	mV	200	260	326		264.1	224	5.57		98	38	140	184	195	192	258		243.6
pH	pH_Units	5.36		4.96	5.2	5.01	5.16		5.09	6.22			5.58			5.48	5.6	5.55
Specific Conductance	uS/cm	204	207	215	212	270.1	213	232	193	87	96	730	224	288	343	347	322	341
Temp	degrees C	23.4	22.4	25.6	21.8		21.9	23.9	23.1	21.6	21.8	21	23.6	22.4	22.5	22.8	21.5	
Turbidity	NTU	2	2	50	0.8	8.31	15	127	72	44.3	219	165	0.35	1	0 U	16	1.3	0.25

Analyte	Units	MW-05I 05/04/2000	MW-05I 01/20/2001	MW-05I 07/26/2007	MW-05I 04/08/2009	MW-05I 10/25/2011_ EPA	MW-06S 05/02/2000	MW-06S 01/19/2001	MW-06S 02/11/2002	MW-06S 07/24/2007	MW-07I 05/03/2000	MW-07I 01/23/2001	MW-07I 07/30/2007	MW-07I 04/09/2009	MW-07I 10/25/2011_ EPA
Ferrous Iron	mg/L	0.05	0.5 U		0.01		0.63	0.5 U	0 U		0.29	0.5 U		0.01	
Dissolved Oxygen	mg/L	10.24	4.19	6.1	6.6	3.97	9.36	4.94	4.6	7	11.22	6.55	4.02	6.4	6.94
ORP	mV	150	245			214.6	138	235	184		139	240			258.5
pH	pH_Units	6.13		5.57	5.8	5.47	5.37			4.9	6.1		5.01	5.2	5.11
Specific Conductance	uS/cm	76	58	59	60	63.2	227	250	232	232	75	269	210	212	219.6
Temp	degrees C	22.7	20.1	22.9	21.7		25.4	24	24	25.8	22.7	19.5	22.1	22	
Turbidity	NTU	28	2	67.3	0.6	0.57	1.2	2	1		11	1	13	1.7	0.1

Analyte	Units	MW-07S 05/03/2000	MW-07S 01/20/2001	MW-07S 07/30/2007	MW-07S 04/09/2009	MW-07S 10/25/2011_ EPA	MW-08I 05/03/2000	MW-08I 01/19/2001	MW-08I 04/21/2009	MW-08I 10/25/2011_ EPA	MW-08S 05/03/2000	MW-08S 01/18/2001	MW-08S 07/24/2007	MW-08S 04/20/2009	MW-08S 10/25/2011_ EPA
Ferrous Iron	mg/L	0.15	2		0.04		0.67	0.5 U	0.05		0.73	0.5 U	0 U	0.01	
Dissolved Oxygen	mg/L	10.84	1.15	1.2	4	2.19	9.26	7.42	3.6	4.77	9.3	5.9	6.5	5.9	6
ORP	mV	211	58	219		202.8	147	178		162.8	168	234			240
pH	pH_Units	5.29		5.54	5.8	5.76	6.19		6	5.71	5.29		4.98	5	5.05
Specific Conductance	uS/cm	244	70	68	70	71.3	74	40	72	56.8	184	228	210	219	210.2
Temp	degrees C	22.7	20.3	22.6	21.8		22.9	21	21.3		24.1	22.3	24.9	22.2	
Turbidity	NTU	1.4	1	77		1.24	29	16	0.8	1.72	0.4	2	29	0.5	0.48

Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.

Landmeyer, et al. "Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010: U.S. Geological Survey Scientific Investigations Report 2011–5148." 2011.

J.M. Hall. Letter to United States Environmental Protection Agency regarding "Capitol City Plume Groundwater Monitoring." Prepared for the City of Montgomery. August 2007.

EMC. "Environmental Site Assessment, Montgomery Advertiser Properties, Montgomery, Alabama 36104." Prepared for Montgomery County Commission. August 2003.

Cousins, Ashley of ACESS, LLC. Email to Geosyntec Consultants, Latham Watkins, and State of Alabama regarding MWWSS Board split samples from October 2011. Sent 20 December 2011.

CH2M Hill. "Downtown Montgomery Sewer Study." Prepared for MWWSS Board. September 1999.

Black & Veatch. "Remedial Investigation Report, Capitol City Plume Site." Prepared for U.S EPA. November 2002.

J.M. Hall. Groundwater Sampling Report, Former Western Rails Site. Prepared for City of Montgomery. November 2006. (Former Western Rails Site was purchased by City of Montgomery from CSX Transportation)

Table 3-2. Summary of Historical Groundwater Quality Measurements
Capitol City Plume Superfund Site
Montgomery, Alabama

Analyte	Units	MW-09S 05/01/2000	MW-09S 01/21/2001	MW-09S 07/26/2007	MW-09S 04/27/2009	MW-09S 10/26/2011_ EPA	MW-10S 05/02/2000	MW-10S 01/21/2001	MW-10S 07/26/2007	MW-10S 04/27/2009	MW-10S 10/26/2011_ EPA	MW-11I 05/08/2000	MW-11I 01/21/2001	MW-11S 05/08/2000	MW-11S 01/22/2001	MW-11S 02/13/2002	MW-12I 02/14/2002	MW-12I 04/22/2009	MW-12I 10/24/2011_ EPA
Ferrous Iron	mg/L	0 U	0.5 U		0.01		0.8	0.5 U		0.01		0.21	0.5 U	1.67	0.5 U	1	0 U	0.12	
Dissolved Oxygen	mg/L	8.62	5.58	6.9	5.5	5.87	9.48	5.05	6.6	5.1	6.1	11.97	5.26	11.8	2.73	0 U	0 U	2.2	2.31
ORP	mV	137	275			268.2	152	252			234.4	126	220	97	163	129	101		78.8
pH	pH_Units	5.25		4.9	5.1	4.94	5.41		5.36	5.3	5.28	6.13						6.1	6.11
Specific Conductance	uS/cm	145	152	152	177	160.4	203	228	263	249	230.4	60	63	194	210	233	180	91	81.2
Temp	degrees C	22.3	21.9	23.3	22.9		23.4	21.8	23.6	22.6		22.1	22.6	24.1	21.4	21.7	20.5	21.2	
Turbidity	NTU	0.95	1	47	0.2	1.32	0.75	1	36	0.5	0.54	230	808	0.45	1	7	3	0.8	35.1

Analyte	Units	MW-12S 02/13/2002	MW-12S 07/30/2007	MW-12S 04/23/2009	MW-12S 10/24/2011_ EPA	PW-05 05/09/2000	PW-05 01/22/2001	PW-08 05/09/2000	PW-08 01/22/2001	PW-09W 05/09/2000	PW-09W 01/22/2001	TW-01 01/09/2001	TW-02 01/10/2001	TW-03 01/10/2001	TW-04 01/11/2001	TW-05 01/11/2001	TW-06 01/12/2001
Ferrous Iron	mg/L	0 U	0.01	0.02		0.27	0.5 U	0 U	0.5 U	0 U	0.5 U	0 U	0 U	0 U	0 U	0 U	0 U
Dissolved Oxygen	mg/L	0 U	3	5.5	4.13	11.6	1.47	11.2	0.36	11.19	5.47	0 U	10.05	10.26	10.5	8.07	11.46
ORP	mV	218	322		190.5	96	22	63	75	189	205	0 U	0 U	0 U	0 U	0 U	0 U
pH	pH_Units		5.25	5.5	5.55	9.04		9.18		5.49							
Specific Conductance	uS/cm	236	218	254	204	339	388	349	377	840	93	171	235	149	160	238	254
Temp	degrees C	21.1	22.3	22		21.3	20.2	23.2	20.6	21.5	19.7	16.4	17.7	16.7	18.7	19.7	17.4
Turbidity	NTU	-2	18	0.1	4.71	0.16	3	0.14	4	0.74	4	165	1000	538	1000	352	191

Analyte	Units	TW-07 01/12/2001	TW-08 01/13/2001	TW-09 01/13/2001	TW-10 01/14/2001	TW-11 01/14/2001	TW-12 01/15/2001	TW-13 01/15/2001	TW-14 02/14/2002	TW-15 02/14/2002	TW-16 02/18/2002
Ferrous Iron	mg/L	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U
Dissolved Oxygen	mg/L	11.99	7.88	6.35	8.64	7.63	7.95	6.7	7.57	3.92	10.5
ORP	mV	0 U	0 U	0 U	0 U	0 U	0 U	0 U	205	125	4
pH	pH_Units										
Specific Conductance	uS/cm	232	270	601	212	578	160	303	165	131	250
Temp	degrees C	17.4	18.7	20.3	19.4	20.4	18.9	20.1	17.7	21.1	19.6
Turbidity	NTU	334	272	250	250	170	638	299	191	78	19.3

Sources of historical groundwater sampling data:

U.S. EPA. "Sampling Investigation Report, Capitol City Plume Site, Montgomery, Alabama, Conducted October 24-27, 2011." 28 February 2012.

Landmeyer, et al. "Investigation of the Potential Source Area, Contamination Pathway, and Probable Release History of Chlorinated-Solvent-Contaminated Groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008–2010: U.S. Geological Survey Scientific Investigations Report 2011–5148." 2011.

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APPENDIX A

MSDS FOR "FREEDOM WASH" AND UC-50 BLANKET

ROLLER WASH SOLUTIONS USED BY THE ADVERTISER COMPANY

Freedom Wash

MATERIAL SAFETY DATA SHEET

Effective Date : 3/06/94

SECTION I - PRODUCT IDENTIFICATION AND PREPARATION INFORMATION

Product Name: Freedom Wash

HMIS RATING

Health	0
Flammability	0
Reactivity	0
Personal Protection	A

Manufacturer Name and Address:
NENSCO
49 Railroad Avenue
Milbury, MA 01527
Phone #: (508) 865-5205

MSDS Prepared by:
Dell Tech Laboratories Ltd.
UWO Research Park
London, Ontario
Phone #: (519) 858-5021

SECTION IIa - HAZARDOUS INGREDIENTS

(as per OSHA Hazard Communication Standard, CFR29 1910.1200 and Canadian WHMIS Regulations)

Does not contain any hazardous ingredients

SECTION IIb - NON-HAZARDOUS INGREDIENTS

(as per OSHA Hazard Communication Standard, CFR29 1910.1200 and Canadian WHMIS Regulations)

Chemical Name	Wt%	ACGIH-TLV	NIOSH-REL	OSHA-PEL	LD_{50}
White distillates	75-100	5mg/m³ (mist)	n/a	5mg/m³ (mist)	n/a

SECTION III - PHYSICAL DATA

Boiling Point (deg. C) : >200
Vapour Pressure (mm Hg @ 70°F) : <0.1
Evaporation Rate (H_2O = 1) : 0.01
pH (as supplied) : 7.0
Viscosity : 60cps
Appearance and Odour : pale amber, with very mild odour.

Specific Gravity (H_2O = 1) : 0.8580
Vapour Density (Air = 1) : Similar
Solubility in Water : emulsifiable
Physical State : Liquid
VOCs (EPA Method 24): 24.9% (or 1.78 lbs/gallon)

SECTION IV - FIRE AND EXPLOSION DATA

Flammability : Not flammable.
Flash Point (deg C, method) : None
Hazardous Combustion Products : Not applicable.
Means of Extinction : Treat for surrounding material.
Special Fire Hazards : None known to us at this time.

LEL Not available

UEL Not available

SECTION V - REACTIVITY DATA

Conditions for Chemical Instability : Stable.
Incompatible Materials : Strong oxidizing agents (i.e. Sodium hypochlorite, hydrogen peroxide).
Hazardous decomposition products : Not applicable.

SECTION VI - TOXICOLOGICAL PROPERTIES

Route of Entry : Eye, Skin contact, Inhalation, Ingestion
Effects of Acute Exposure :
Eye : no irritation is expected from short term exposure
Skin : no irritation is expected from short term exposure
Inhalation of mist: no significant adverse health effects are expected from short term exposure.
Ingestion : May have a laxative effect, vomiting, and headaches.

Effects of Chronic Exposure : None
Respiratory Tract Sensitization : No data available
Carcinogenicity : Non-applicable
Teratogenicity, Mutagenicity, Reproductive effects : Insufficient data available.
Synergistic Materials : Not available.

SECTION VII- PREVENTATIVE MEASURES

Gloves : Not required, but for good industrial hygiene should be used.
Eye protection : Chemical splash goggles or safety glasses.
Respiratory protection : Not required
Other protective equipment : As required by employer code.
Note : Ensure that the product does not spill unto any walk- ways since the product can create a slippery surface.
Engineering Controls : General ventilation normally adequate.
Leak and Spill Procedure : Before attempting clean-up, refer to hazard data given above. Small spills may be absorbed with non-reactive absorbent and placed in suitable, covered, labelled containers. Prevent large spills from entering sewers or waterways. Contact emergency services and supplier for advice.
Waste Disposal : Review federal, state, provincial (in Canada) and local government requirements prior to disposal.
Storage Requirements : Store in closed container. Store away from incompatible materials.

SECTION VIII - FIRST AID

Eye : Immediately flush with water for 15 minutes. Call a doctor if irritation persists.
Skin : Flush with water. Call a doctor if irritation develops. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Inhalation: Remove to fresh air. If symptoms persist, call a doctor.
Ingestion : Do not induce vomiting. Rinse mouth with water, then drink one glass of water. Contact a doctor immediately. Never give anything by mouth if victim is unconscious, is rapidly losing consciousness or is convulsing.

SECTION IX - REGULATORY INFORMATION

I US Environmental Protection Agency (EPA)
SARA - Section 313 Emissions Reporting: Does not contain any listed components
CERCLA - Hazardous Substance/Reportable Quantity (RQ): Does not contain any listed components
Clean Air Act (CAA) - 1990, List of Hazardous Air Pollutants: Does not contain any listed components
Clean Water Act, (CWA) Section 311: Does not contain any listed components
Resource Conservation and Recovery Act (RCRA): Does not contain any listed components.

II *State Right-to-Know Lists*
New Jersey Right-to-Know List: Does not contain any listed components
Pennsylvania Right-to-Know List: Does not contain any listed components
Florida Right-to-Know List: Does not contain any listed components
Minnesota Hazardous Substances List: Does not contain any listed components
Massachusetts Right-to-Know List: Does not contain any listed components

M A T E R I A L S A F E T Y D A T A S H E E T

PRODUCT NAME: UC 50 WASH **HMIS CODES: H F R P**
PRODUCT CODE: A761 1 2 0 B
CHEMICAL NAME: BLANKET AND ROLLER WASH

========== SECTION I - MANUFACTURER IDENTIFICATION ==========

MANUFACTURER'S NAME: PRINTERS' SERVICE
ADDRESS : 26 Blanchard Street
Newark, New Jersey 07105

EMERGENCY PHONE : 1-800-424-9300 LAST REVISION : 08/07/00
INFORMATION PHONE : 1-973-589-7800 **DATE REVISED** : 01/30/01
PREPARER : ENVIRONMENTAL DEPT.

========== SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION ==========

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP	WEIGHT PERCENT
ALIPHATIC PETRO DISTILLATE (C9 - C11)	64742-48-9	2.7 mmHg 25 C	50 - 60%
PEL 100ppm: TLV 100ppm // LD50> 25ml/kg: LC50 700ppm/4hr			
AROMATIC PETRO DISTILLATE (C8-C11)	64742-95-6	2.7mmHg 25 C	30 - 40%
PEL 100 ppm // LD50 4.7g/kg: LC50 3670 ppm/8hr			
* 2-BUTOXYETHANOL	111-76-2	0.6 mmHg 20 C	10 - 20%
PEL 25ppm: TLV 25ppm // LD50 1.746g/kg: LC50 800ppm/8hr // HAP reportable			
NONYLPHENOXYPOLY(ETHYLENEOXY)ETHANOL	9016-45-9	NO DATA NO DATA	1 - 10%
LD50 2.4g/Kg			

* Indicates chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372. CAS# 64742-95-6 contains approximately 5% XYLENE (CAS# 1330-20-7) an HAP reportable which has a PEL and TLV of 100 ppm: approximately 4% CUMENE (CAS# 98-82-8). an HAP reportable which has a PEL and TLV of 50 ppm-skin: and approximately 27% 1.2.4 TRIMETHYLBENZENE (CAS# 95-63-6). which has a PEL and TLV of 25 ppm. XYLENE. CUMENE AND 1.2.4 TRIMETHYLBENZENE are subject to the reporting requirements of section 313 OF SARA TITLE III.

========== SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS ==========

BOILING POINT : 315 F
VAPOR DENSITY : 4.5 (air = 1)
DRYING RATE : 0.25(nButyl Acet.=1)
PHOTOREACTIVE : YES
VOLATILES : 98%
PHYSICAL STATE : LIQUID
SPECIFIC GRAVITY (H2O=1): 0.81
VAPOR PRESSURE : 2.5 mmHg at 20 C
VOC : 6.66 lb/gal METHOD: EPA #24
H2O SOLUBILITY : SLIGHT
APPEARANCE : CLEAR
ODOR : MODERATE SOLVENT

========== SECTION IV - FIRE AND EXPLOSION HAZARD DATA ==========

FLASH POINT : 103 F **METHOD USED:** TCC
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.5 **UPPER:** 10.6
EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, OR DRY POWDER (WATER MAY BE INEFFECTIVE)
SPECIAL FIREFIGHTING PROCEDURES : KEEP CONTAINER COOL. CONTROL COOLING WATER SINCE IT MAY TEND TO SPREAD BURNING MATERIAL.
UNUSUAL FIRE AND EXPLOSION HAZARDS: IF BOILING POINT OF SOLVENT IS REACHED. THE CONTAINER MAY RUPTURE EXPLOSIVELY AND IF IGNITED. GENERATE A FIREBALL.

========== SECTION V - REACTIVITY DATA ==========

STABILITY: YES **IF NO CONDITIONS:** .
INCOMPATIBILITY (MATERIALS TO AVOID): YES
IF YES WHICH ONES: STRONG OXIDIZER
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE ON IGNITION
HAZARDOUS POLYMERIZATION: NONE

========== SECTION VI - HEALTH HAZARD DATA ==========

INDICATIONS OF EXPOSURE:
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: HEADACHE, DIZZINESS, NAUSEA. VERY HIGH LEVELS OF VAPORS COULD CAUSE UNCONCIOUSNESS. SLIGHT IRRITATION OF THE MUCOUS MEMBRANE

EYE CONTACT AND SYMPTOMS OF EXPOSURE: REDNESS OR BURNING SENSATION.
SKIN HEALTH RISKS AND SYMPTOMS OF EXPOSURE: REDNESS, ITCHING, IRRITATION ON OVEREXPOSURE.
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SEVERE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA.

EMERGENCY AND FIRST AID PROCEDURES

IF IN EYES: FLUSH WITH WATER FOR 15 MIN. LIFT UPPER AND LOWER EYE LIDS. SEE A DOCTOR.
IF ON SKIN: WASH WITH SOAP AND WATER.
IF INHALED: REMOVE TO FRESH AIR. IF UNCONSCIOUS, USE ARTIFICIAL RESPIRATON.
IF INGESTED: DO NOT INDUCE VOMITING. SEE DOCTOR IMMEDIATELY TO PUMP STOMACH.

HEALTH HAZARDS (ACUTE AND CHRONIC):

EFFECT OF CHRONIC EXPOSURE: PROLONGED HIGH VAPOR EXPOSURE MAY CAUSE LIVER AND KIDNEY PROBLEMS.
EFFECT OF ACCUTE EXPOSURE: NONE

IN ALL CASES OF EMERGENCY AND FIRST AID, WE STRONGLY RECOMMEND A DOCTOR BE SEEN

CARCINOGENICITY: NTP CARCINOGEN: No **IARC MONOGRAPHS:** No **OSHA REGULATED:** No

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: DERMATITIS. MAY AGGRAVATE EXISTING LIVER AND KIDNEY AILMENTS.

========== SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE ==========

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: VENTILATE AREA. KEEP AWAY FROM STRONG OXIDIZERS, HEAT, SPARKS OR OPEN FLAMES. PREVENT SPILL FROM SPREADING BY USING AN INERT MATERIAL, SUCH AS SAND, AS A DAM. KEEP OUT OF ALL WATERWAYS OR WATER DRAINS. DO NOT FLUSH AREA WITH WATER. FOR SMALL SPILLS USE ABSORBENT PADS. FOR LARGE SPILLS, CALL A SPILL RESPONSE TEAM. IF REQUIRED, CONTACT STATE/LOCAL AGENCIES.

WASTE DISPOSAL METHOD: PRODUCT SOAKED ABSORBENT SHOULD BE PLACED IN SEALED METAL DRUMS FOR DISPOSAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: KEEP AWAY FROM STRONG OXIDIZERS, HEAT, SPARKS AND OPEN FLAMES. DO NOT CUT OR DRILL INTO AN EMPTY CONTAINER IN ANY WAY THAT MIGHT GENERATE A SPARK. SOLVENT RESIDUE IN THE CONTAINER COULD IGNITE AND CAUSE AN EXPLOSION. KEEP CONTAINER TIGHTLY CLOSED AND OUT OF THE WEATHER.

OTHER PRECAUTIONS: WE RECOMMEND THAT CONTAINERS BE EITHER PROFESSIONALLY RECONDITIONED FOR REUSE OR PROPERLY DISPOSED OF BY CERTIFIED FIRMS TO HELP REDUCE THE POSSIBILITY OF AN ACCIDENT. DISPOSAL OF CONTAINERS SHOULD BE IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS. "EMPTY" DRUMS SHOULD NOT BE GIVEN TO INDIVIDUALS.

========== SECTION VIII - CONTROL MEASURES ==========

EXPOSURE CONTROL AND PERSONAL PROTECTION:

RESPIRATORY PROTECTION: IF TLV IS EXCEEDED USE A GAS MASK WITH APPROPRIATE CARTRIDGES, CANNISTER OR SUPPLIED AIR EQUIPMENT.
VENTILATION: IF NORMAL VENTILATION IS INADEQUATE USE ADDITIONAL SYSTEMS.ESPECIALLY LOCAL VENTILATION. IF THE VAPOR LEVEL CAN APPROACH THE LEL - LOWER EXPLOSION LIMIT, USE EXPLOSION PROOF SYSTEMS.
PROTECTIVE GLOVES: USE SOLVENT RESISTANT GLOVES.
EYE PROTECTION: USE SAFETY GLASSES OR GOGGLES.
OTHER PROTECTIVE EQUIPMENT OR CLOTHING: NONE.

WORK/HYGIENIC PRACTICES: WASH SKIN/CLOTHES IF THEY COME IN CONTACT WITH THE PRODUCT. DO NOT WEAR CLOTHING WET WITH THE PRODUCT.

========== SECTION IX - SHIPPING INFORMATION ==========

GROUND SHIPMENT. **UN No : NA 1993**

D.O.T HAZARD CLASSIFICATION: COMBUSTIBLE LIQUID- N.O.S.

========== SECTION X - DISCLAIMER ==========

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