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*Our Contribution to the Environment®*

January 29, 2014

Mr. Kevin Collins
Georgia Environmental Protection Division
Response and Remediation Program (RRP)
Suite 1054 East Tower
2 Martin Luther King, Jr. Drive, S.E.
Atlanta, Georgia 30334-9000

**Subject:** **McKenzie Tank Lines, Port Wentworth, HSI Site No. 10406**

Dear Mr. Collins:

On behalf of McKenzie Tank Lines (MTL), Environmental International Corporation (EIC) is pleased to submit the attached Voluntary Investigation and Remediation Plan (VIRP) package to enroll the above referenced site in the Georgia Voluntary Remediation Program (VRP). In a separate cover, MTL is transmitting the application fee in the amount of $5,000 payable to Georgia Department of Natural Resources.

Please note that MTL submits this application with the consent of Georgia Ports Authority (GPA) in good faith, seeking approval from EPD of a remediation plan for the contaminated site. MTL and GPA have asked me to convey, however, that the application concerns matters that are in dispute between the parties, and some of the application language regarding the history of the site is disputed. The parties have agreed that nothing in this application can be introduced into evidence as an admission against interest of either one of them, or otherwise construed as an admission of any kind by any party, in any pending or future litigation involving the site in question. Both MTL and GPA will continue, in any such litigation, to bear the burden of proof by a preponderance of evidence on any affirmative position alleged by either of them.

The VIRP package includes:

1. Completed and duly endorsed Voluntary Investigation Remediation Plan (VIRP) Application Form and Checklist with the referenced material.
2. One bound paper copy of the VIRP package.
3. Two Compact Discs each with the VIRP package in searchable PDF format.

If you have any questions regarding this submittal, please contact Mr. Thomas Panebianco of GPA at 850-350-2249 or me at the above location.

Sincerely,
ENVIRONMENTAL INTERNATIONAL CORPORATION

Raj Mahadevaiah, P.E., C.G.W.P.
President & CEO

cc: Mr. Jim Schaeffer, (MTL)
Thomas F. Panebianco, (MTL)
David Burkoff, (Hunter Maclean)
Christopher Novack, (GPA)

FORMER MCKENZIE TANK LINES SITE, PORT WENTWORTH, GEORGIA

# VIRP APPLICATION

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January 29, 2014

Submitted to:
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Hazardous Sites Response Program, Land Protection Branch
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B. Warranty Deed and Legal Description for McKenzie Property
C. Chatham County Tax Plat Map
D. Current Tax Plat Property Owner's Table
E. Previous McKenzie Property Boundary
F. Regional Stratigraphic Column
G. Regional Geologic Cross-section
H. Historic Plume Maps

# Acronyms and Abbreviations

| | |
|---|---|
| AOC | areas of concern |
| AST | aboveground storage tank |
| BGS | below ground surface |
| CAP | Corrective Action Plan |
| CFM | cubic feet per minute |
| COC | constituent of concern |
| CSIA | compound specific isotope analysis |
| CSR | Compliance Status Report |
| CVOC | chlorinated volatile organic compounds |
| CY | cubic yards |
| DCE | cis 1,2-dichloroethylene |
| DO | dissolved oxygen |
| EAP | enzyme activity probes |
| EAS | Enhanced Attenuation System |
| EIC | Environmental International Corporation |
| EPA | United States Environmental Protection Agency |
| EPD | Georgia Environmental Protection Division |
| FBQSTP | Field Branches Quality System and Technical Procedures |
| Geovac | Geovac Environmental Services, Inc. |
| GPA | Georgia Ports Authority |
| GPM | gallons per minute |
| GSCCCA | Georgia Superior Court Clerk's Cooperative Authority |
| GTS | groundwater treatment system |
| HSI | Hazardous Site Inventory |
| MCL | Maximum Contaminant Level |
| MTL | McKenzie Tank Lines Inc. |
| NPDES | National Pollutant Discharge Elimination System |
| ORP | oxidation reduction potential |
| PAT | pump-and-treat |
| PCE | Perchloroethylene also known as tetrachloroethylene |
| PEP | pulse-extraction process |
| RAGS | EPA's Risk Assessment Guidance for Superfund |
| RCRA | Resource Conservation and Recovery Act |
| RRS | Risk Reduction Standards |
| RSL | Regional Screening Level |
| SCADA | system control and data acquisition |
| SCM | Site Conceptual Model |
| TCE | Trichloroethylene |
| TOV | total organic vapor |
| UIC | Underground Injection Control |

| | |
|---|---|
| VIRP | Voluntary Investigation and Remediation Plan |
| VOC | volatile organic compounds |
| VRP | Voluntary Remediation Program |

SECTION 1

# 1 INTRODUCTION

McKenzie Tank Lines Inc. (MTL) is currently addressing its legacy environmental issues at a property (site) in Port Wentworth, Georgia. On December 18, 2000, MTL sold the property to Georgia Ports Authority (GPA). The property is contaminated with chlorinated solvents and other chemicals from past site operations as well as from other potential off-site source(s).

The site was first the subject of a diesel release in 1992. Subsequently, the EPD listed the site under the hazardous site inventory (HSI) designating the site as HSI Site No. 10406. Although MTL conducted certain environmental remediation at the site, multimedia environmental chlorinated volatile organic constituents (CVOC) are persistent at the site. As such, GPA is currently unable to develop the site for its intended use.

MTL retained EIC to develop an alternative pathway that would also enable GPA to develop the site. On July 1, 2013, EIC and MTL presented a conceptual technical strategy to GPA that provides an alternative pathway in reaching remedial end points concerning the solvent issues. GPA acknowledged that EIC's conceptual strategy under the Georgia Voluntary Remediation Program (VRP) would make way for a feasible path to pursue its site development plans.

Subsequently, EIC arranged a joint meeting between MTL, GPA, and the Georgia Environmental Protection Division (EPD). The purpose of the meeting was to review the site history, prevailing site conditions, technical challenges, and EIC's conceptual technical approach to be outlined in a Georgia Voluntary Investigation and Remediation Plan (VIRP). On September 10, 2013, EIC conducted a pre-VIRP meeting at the EPD office in Atlanta, Georgia. Based on EIC's technical presentation, EPD concurred with EIC's in situ remediation approach. EPD also established December 31, 2013 as a milestone to receive the VIRP application along with the VIRP document. Upon VIRP approval and installation of the remediation system outlined in Section 4.2.2, GPA can proceed with site development concurrently with the remediation of subsurface contamination.

The VIRP will enable MTL to reach remedial end points in a more cost-effective manner and within a reasonable time frame. The completed Voluntary Investigation and Remediation Plan (VIRP) and the application checklist are provided as Attachment A. The following sections address the elements of the VIRP application criteria.

## 1.1 SITE LOCATION

The site is located at 111 Grange Road, Port Wentworth, Georgia 31407. The facility was originally developed in 1983 on a 5.18–acre site comprised of two parcels known as identification numbers PWT-0021-01-001 and PWT-0022-02-006.

Figure 1-1 is a site layout map that illustrates the former layout of the facility. The site was comprised of an office building, a 10,000-gallon aboveground diesel storage tank (AST), a pump dispenser, Tire Shop, and a wash rack. Figure 1-2 presents a milestone chart with key terminal activities pertaining to the environmental issues at the site.

MTL has historically utilized the facility for truck maintenance. Prior to 1989, the Tire Shop was utilized as a wash rack. In 1989, MTL built the wash rack located to the west of the Tire Shop and transferred the truck washing operations to this location. The AST was formerly located in a concrete retaining wall. Diesel was conveyed to the pump dispensers, located to the west of the AST, for refueling MTL's trucks. Surface runoff from the facility was conveyed to a drainage ditch located at the center of the site oriented in a north-south direction. The runoff flowed through pipes and culverts to the south and ultimately to the west southwest portion of the property.

After GPA's acquisition of the site in 2000, a number of superstructures were demolished. Currently, only the structural walls of the Tire Shop are remaining at the site. GPA currently utilizes the site for parking vehicles, truck beds, and container storage related equipment.

## 1.2 LEGAL DESCRIPTION & TAX PLAT

The warranty deed describing the original 9.2 acres of property purchased by GPA from MTL on December 18, 2000 is located in Attachment B. Attachment B also contains a legal description that was part of a more extensive survey titled: "A Survey of Original Lots 74 through 104 and a portion of Lot 72, Ray Street and an unopened street being a portion of the Grange Subdivision, 8th G.M. District, Port Wentworth, Chatham County, Georgia". Attachment C is a modified copy of the current Chatham County tax plat map obtained from the Chatham County Board of Tax Assessors Office via their online GIS database. This map illustrates the parcel numbers and property boundaries of the site (former MTL boundaries highlighted with red dashed lines) and of surrounding properties as currently defined by this office.

Attachment D, derived from the Georgia Superior Court Clerk's Cooperative Authority (GSCCCA) file database, is a table listing the current property owners of the site and each parcel adjacent to the site as defined by this office. Attachment E is a property boundary map showing the location of property boundaries, prior to GPA purchasing said properties which are located in tax parcel ID 1-0729-01-007. Outlined in Attachment E is the property boundary for lot number 30, previously owned by MTL and purchased by GPA on December 18, 2000.

Referring to Attachments C and E, the former MTL site property boundary for Lot 30, which was previously owned by MTL, is bisected by tax parcels 1-0729-01-007 and 1-0729-01-009. Also referring to Attachment C, the site is bounded to the West (across U.S. Highway 17 R.O.W.) by GPA. To the North of the site (across Grange Road R.O.W.) (from west to east) are properties owned by American Warehousing IV, LLC, Imperial Savannah, LP, Georgia Power Company, Southern Region Industrial REA, Norfolk Southern Corp., and once again by Imperial Savannah, LP. To the South and East, the site is bordered by GPA property.

## 1.3 SITE GEOLOGY

### 1.3.1 Regional Geology

According to Farley-Jones (1993), MTL is located in the Coastal Plain of Georgia underlain by more than 1,400 feet of sedimentary deposits from marine and fluvial processes. Attachment F (Farley-Jones 1993) illustrates the general stratigraphy of the regional geology. The primary geologic unit of interest for the MTL site is the upper lithologic unit known as Pliocene resulting from fluvial and marine origin. This unit, extending from near surface to a depth of 30 feet below ground surface (bgs), is comprised of silt, sand, gravel, and marl. The lithological unit immediately underlying the Pliocene deposits is the Miocene deposits composed of two geologic units known as the Hawthorn group and the Tampa limestone formation. The Hawthorn group, extending from approximately 30 to 200 feet bgs, consists of sandy clayey silt with tongues of weathered limestone. The Hawthorn group acts a confining unit with some water in sandy interbeds.

Referring to regional geologic cross-section included as Attachment G (Farley-Jones, 1993), the surface topography of the Pliocene to Recent deposits are relatively horizontal. The surface of the confining unit, comprised of the Hawthorn formation, however, dips to the east beneath the MTL site. The underlying Tampa Limestone formation, however, dips significantly to the west.

### 1.3.2 Site-specific Geology

The surficial geology of the site consists of unconsolidated marine and alluvial deposits of the Atlantic Ocean and Savannah River, respectively. According to Geovac (2002), the MTL site is located at an elevation of 10 to 15 feet above mean sea level. The site was apparently completed by raising the elevation of low lying areas to several feet above the natural gradient using fill material. In addition, Geovac was unable to correlate the geologic data from the unconsolidated sediments collected from boreholes extending to greater depths beneath the fill.

According to Farley-Jones (1993), the uppermost 3 to 5 feet layer is generally composed of sandy fill material of various grades. The next lower stratum is composed of sandy clay to clayey sand to a depth of 8 to 10 feet below grade. According to Gevoac (2002), the lower stratum extending from 10 to 30 feet below grade is composed of fine-grained silty sands with clay lenses and thin lenticular clay units. In summary, the site geology varies substantially resulting in homogeneous and *anisotropic*[1] site conditions for groundwater flow. It is important to note, however, that the geologic unit underlying upper 30 feet of fluvial deposits acts as a confining unit.

## 1.4 SITE HYDROGEOLOGY

### 1.4.1 Regional Hydrogeology

Referring to Attachment G, the surficial water bearing aquifer is reportedly within the upper 30 feet. The confining unit only has some water in sandy interbeds. The Floridian aquifer located beneath the confining at depths ranging from 200 feet to 870 feet is the primary water bearing resource for public and private water supply.

### 1.4.2 Site-specific Hydrogeology

As noted in Section 1.4.1, the surficial aquifer is located in the upper 30 feet. Historic gauging data at the site indicates that the water table of the unconfined surficial aquifer is located at depths ranging from 3 to 7 feet bgs.

Based on varying site geology in the upper stratum relative to the lower stratum, previous site investigators have historically distinguished the wells completed in the respective depths as shallow wells (screened at depths above 20 feet below grade) and deep wells (screened between 20 and 30 feet below grade). Utilizing water level data collected during the August 2013 groundwater sampling event, EIC prepared Figures 1-3 and 1-4 to illustrate the shallow and deep potentiometric maps. From Figure 1-3, it is apparent that the groundwater flow is generally towards the west. Referring to Figure 1-4, that depicts the groundwater flow direction in the deep wells is also to the west.

## 1.5 COC & DELINEATION STANDARDS

Based on a review of the historic site investigations, it is apparent that chlorinated volatile organic compounds (CVOC) are the primary constituents of concern (COC) at the site. The predominant COC is tetracholroethylene also known as perchloroethyelene (PCE). As discussed in Section 3.2.2,

[1] ***Anisotropy:*** *The condition under which one or more of the hydraulic properties of an aquifer vary according to the direction of flow (Fetter, 1998).*

the PCE has degraded into other CVOCs. Site delineation concentration criteria for the COCs found at the site in soil and groundwater are tabulated in Tables 1-1 and 1-2.

### 1.5.1 Additional delineation standards

Since diesel was once released at the site, as discussed in Section 2.1, Tables 1-1 and 1-2 also includes delineation criteria for volatile organic compounds (VOCs). It is important to note that VOCs were not detected in subsequent sampling events. Additionally, chromium was detected in groundwater at the site. As such chromium is also listed in Table 1-2. During the VIRP implementation, MTL will obtain representative samples to verify if chromium is persistent at the site and if so investigate the potential source that could contribute chromium.

## 1.6 RISK REDUCTION STANDARDS

Based on available site specific data, EIC has derived risk reduction values (RRS) for soil and groundwater. The RRS values will be utilized as cleanup goals for the site. As discussed in Section 4.4, MTL may propose updated RRS values based on additional knowledge gained during the VIRP implementation.

### 1.6.1 RRS for Soil

EIC has developed Type IV RRS for soil as the targeted cleanup goals for the site. These values were derived from backup computations listed in Tables 1-4 to 1-10.

As discussed in section 3.1, MTL has already remediated soils at various locations within the site. However, adequate number of samples were not collected to demonstrate clean closure prior to backfilling the excavations. MTL will collect additional soil samples from these excavations to verify if source material was removed from each location. The analytical results from the additional samples will be compared to Type IV RRS values listed in Table 1-3 to determine if the source material that exceeded the RRS values was removed from the excavations.

### 1.6.2 RRS for Groundwater

EIC has also developed Type IV RRS for groundwater as the targeted cleanup goals for the site. The proposed RRS values for groundwater are listed in Table 1-11. These values were derived from backup computations listed in Tables 1-12 to 1-14. These values will serve as cleanup goals for remediation of groundwater contamination at the site.

SECTION

2

# 2 SITE CONCEPTUAL MODEL

A Site Conceptual Model (SCM), also known as Conceptual Site Model, is a summary of the site conditions as it pertains to a contaminant release. Typically, the model defines release sources, extent of the plume, likely fate and transport mechanisms, potential exposure pathways, and potential receptors that could be impacted. This information serves as an important tool in developing site remedies. The following sections provide a preliminary SCM based on available site data. As additional knowledge is gained, during the implementation of the VIRP, EIC will sequentially refine the SCM.

## 2.1 RELEASE SOURCES

Previous investigations have identified both potential on-site and off-site sources that have contributed to the soil and groundwater contamination at the site. The following excerpts about soil and groundwater contamination were derived from various historical reports.

### 2.1.1 On-site Sources

There are several on-site release sources that have been documented in previous reports. In 1992, diesel fuel and black liquor were accidentally released through the storm water drainage system into the adjacent storm water ditch (Farley-Jones, 1993).

Subsequently, additional on-site contamination was discovered at various locations within the site. MTL was unable to find any documentation or testimonials on the actual sources that contributed to the contamination (Geovac, 2002). Table 2-1 presents a list of on-site release sources in ten areas of concern (AOC). The table also lists the corresponding COC and potentially affected media. The depth to water within each AOC is less than 6 feet below grade. Figure 2-1 illustrates the location of each AOC.

### 2.1.2 Off-site Sources

During the site investigation, MTL identified chromium in groundwater at various locations within the MTL property. Considering that MTL did not use chromium, the source of the chromium is unclear. A review of the sites surrounding the MTL property revealed that an off-site property located to the north northeast of the MTL property has reported presence of chromium. During the VIRP implementation, MTL will determine if chromium is persistent and attempt to identify the potential source.

### 2.1.3 Third-Party Sources

After GPA's acquisition of the property, a minor release of gasoline was reported at the site. This release apparently originated from a portable lighting system and apparently took place in a parking lot. During the VIRP implementation, MTL will determine the location and extent of the gasoline release.

After GPA's site acquisition, heavy metals were reportedly present in samples taken from a holding pond identified as Holding Pond No. 2. This holding pond was later backfilled. During the VIRP implementation, MTL will verify the potential presence of heavy metals in the former holding pond.

## 2.2 REMEDIAL RESPONSE

The releases discussed in the aforementioned sections resulted in multimedia contamination composed of soil, soil vapor, groundwater, sediment, and surface water media. The following subsections describe the remedial actions performed for each media.

### 2.2.1 Soil

Upon discovering COCs in various AOCs, MTL performed excavation, treatment, and disposal of contaminated soils and sediments in several AOCs. The shaded areas illustrated in Figure 2-2 provides the approximate limits of the historical excavations in various AOCs. Table 2-2 lists the excavation locations and approximate volumes of material removed. Most of the excavated soils were transferred to Pecan Road Landfill in Valdosta, Georgia for disposal and an unknown quantity of the material was land farmed within the Tire Shop.

It is important to note that MTL removed a concrete floor from the former Tire Shop in February 2001 during the aforementioned excavation activities (Geovac, 2001a). The removed concrete floor previously occupied an area of approximately 20 feet in width and 50 feet in length within the Tire Shop. The subsurface beneath this floor was not excavated but an in situ soil venting program was conducted as discussed in subsection 2.2.2.

### 2.2.2 Soil Vapor

After discovering residual contamination in the *vadose zone* [2] beneath the Tire Shop, MTL initiated a soil vapor remediation program. This was comprised of excavation of approximately 1,000 cubic yards of contaminated soils, land farming, and heat induced soil venting. Prior to the soil venting process, MTL built a fiberglass roofed shed over the soils. The soil gas from the venting process was passed through carbon canisters prior to disposal. Post treatment sampling of soils collected at 0.5, 2, 3, and 5 feet below grade at the Tire Shop indicated COC concentrations were below laboratory reporting limits (Geovac, 2002).

### 2.2.3 Groundwater

In 1998, MTL initiated a long-term groundwater pump-and-treat system (PAT). According to Geovac (2002), water from three 4-inch diameter recovery wells was pumped through a series of water aerator tank, air-stripping tower, and dual carbon canisters prior to discharge into a retention pond located to the east of the former Tire Shop. The PAT was later expanded to include additional recovery wells and the discharge point was moved to a percolation pond located to the south of the Tire Shop.

### 2.2.4 Sediment

According to Farley-Jones (1993), approximately 60 cubic yards of sediments were removed from the storm water ditch during the remedial actions performed in response to the 1992 diesel release. The sediments were initially treated on site by land farming and then transferred to Pecan Road Landfill in Valdosta, Georgia.

### 2.2.5 Surface Water

During the response initiated to address the diesel fuel and black liquor release in 1992, MTL impounded the discharged material in the storm water ditch and recovered approximately 40,000 gallons of oily water and transferred the waste liquids to the City of Pritchard, Alabama waste disposal facility (Geovac, 2002).

[2] ***Vadose Zone****: The unsaturated zone between the land surface and the water table (Fetter, 1998).*

## 2.3 Extent of Residual Contamination

### 2.3.1 Soil Delineation

Based on historical sampling events, CVOCs were the primary COCs identified at the site. Referring to Table 2-3 and Figure 2-3, it is clear that a number of soil and sediment samples were obtained after soil excavation in various AOCs for post-excavation assessment. Table 2-4 tabulates the analytical results for the corresponding samples. Of the 83 samples collected only 25 samples indicated presence of contaminants above delineation standards.

During the VIRP implementation, MTL will obtain verification samples from each AOC to complete soil delineation and determine if residual contamination is present above RRS limits.

### 2.3.2 Soil Vapor

According to Farley-Jones (1993), a total of 121 soil vapor samples were collected from various locations within the site. Vapor samples were collected in a modified 50-foot grid area throughout the site with a hand auger at 2-foot depth intervals extending to 2, 4, and 6 feet below grade. The samples were field screened for total organic vapors (TOV). Based on the results, Farley-Jones concluded that the areas around the wash rack, Tire Shop, and the diesel dispensers indicated elevated organic vapor concentrations.

Considering that excavations were performed in numerous locations, several years ago, MTL does not anticipate residual contamination to be persistent at the site. During the VIRP implementation, MTL will collect vapor samples from selected AOCs to determine if residual soil vapor concentrations are present in excess of instrument detection limits. Based on the results, MTL will calculate site-specific vapor intrusion concentrations to determine potential vapor intrusion pathways for site workers.

### 2.3.3 Groundwater Delineation

Based on historical sampling events, COCs discussed in Section 1.5 were detected in groundwater samples obtained from monitoring wells located at various locations within the site.

Referring to Table 4-1, a total of 74 wells have been installed at the site. Of these wells, 19 wells have been destroyed or abandoned and the status of 31 wells is unknown. Table 2-5 is a summary of historical groundwater analytical results for groundwater sampling events that were completed during the period from 1993 to 2013.

Based on site background data, it is apparent that the analytical data was historically reviewed from samples taken in wells completed in two depth intervals. Figures 2-4 through 2-11 illustrate both the delineation limits and peak concentrations of the CVOCs from the most recent sampling event.

Figures 2-4 through 2-7 represent CVOC concentrations in shallow wells and Figures 2-8 through 2-11 represent CVOCs in deep wells.

Considering the groundwater flow direction, these figures indicate that the horizontal extent of CVOCs is relatively well delineated within the MTL's site boundary. The figures also illustrate the speciated CVOC byproducts supporting natural attenuation mechanisms in process.
Arsenic was reportedly found in groundwater at slightly over the maximum contaminant level (MCL) in well MW-8S and very near MCL levels in well MW-13S. EPD considered the arsenic delineation in groundwater complete except for a requirement that MW-13S be resampled to reconfirm the concentrations that were near MCL levels (EPD, 2005). Further investigation, however, is necessary to delineate whether any off-site or third-party sources may have contributed arsenic in groundwater.

### 2.3.4 Sediment

Referring to Figure 2-3, it is apparent several sediment samples have been collected at numerous locations within the storm water ditch. According to Farley-Jones (1993), all samples collected within the ditch indicate CVOC concentrations below detection limits. Low levels of polynuclear aromatic hydrocarbons were detected in one sample noted as 15 at the southwest corner of the site (Figure 2-3). Subsequent sampling collected at SED-9 adjacent to 15 indicated that the CVOC concentrations were below delineation standards (Table 2-4). In a letter dated March 18, 2008, EPD concluded that no additional samples are necessary to evaluate arsenic concentrations in sediments (EPD, 2008). During the VIRP implementation, MTL will collect a sample from the infiltration pond to define the COC levels in the bottom sediments.

### 2.3.5 Surface Water

Currently, the primary impoundment of surface water is comprised of the percolation pond located to the south of the Tire Shop. Based on a review of historical reports it is apparent that surface water samples have been routinely collected from the percolation pond during groundwater sampling events. According to Geovac (2012), sample analyses have indicated that the VOCs and CVOCs have consistently been reported as below laboratory reporting limits. During the VIRP implementation, MTL will collect a surface water sample from the infiltration pond to define the prevailing COC levels.

## 2.4 FATE & TRANSPORT

As discussed in Section 2.1, the multimedia contamination at the site could have resulted from on-site sources, off-site sources, or third-party sources. The main purpose of the fate and transport evaluation is to assess the migration potential of the released COC in a multimedia setting. Based on such an assessment, it is possible to establish potential exposure levels, critical in establishing risk-based screening and cleanup goals.

Typically, the COCs identified at the site are subject to the following mechanisms:

- Physical separation of released product into other states of matter due to sorption, solubility and other equilibrium reactions.
- Dispersion involving horizontal and vertical spreading of partitioned or leached constituents.
- Diffusion consisting of spreading from concentration gradients.
- Biodegradation by native microorganisms along the migration pathway.
- Other attenuation processes that reduce the concentrations with time and distance.

As discussed in Section 2.2, the primary sources of release have been removed from the site and a vast quantity of contaminated soil and sediment media has been excavated. With the exception of the residual contamination remaining from previous excavation activities no other onsite sources of contamination have been reported.

Consequently, it appears that the predominant media requiring remediation is groundwater contamination. It is well documented that groundwater contamination is subject to advection, dispersion, diffusion, and biodegradation.

## 2.5 MIGRATION PATHWAYS

Based on the discussions in Section 2.3, it is apparent that CVOC is the primary COC that has a potential to migrate at the MTL site. During the VIRP implementation, MTL will determine if any other COCs such as metals are a potential concern at the site and if so their potential migration pathways. The following subsections describe various pathways through which COCs can migrate at the site as illustrated in Figure 2-12.

### 2.5.1 Soil COC

Soil contamination can migrate with surface runoff or as a leachate that can migrate to groundwater. This pathway will be further evaluated during the VIRP implementation.

### 2.5.2 Soil Vapor Migration Potential

Soil vapor can migrate within the vadose zone or into surface or subsurface structures. As discussed in Section 2.2.2 and 2.3.2, soil vapor is not a concern at this site. Based on additional sampling noted in Section 2.3.2, MTL will determine whether soil vapor is persistent and if so its migration potential.

### 2.5.3 Dissolved COC Migration Potential

Typically, dissolved contaminants tend to move with the groundwater flow. Consequently, the peak plume would be subject to a migration consistent with *seepage velocity*[3]. In comparing the figures representing dissolved CVOC plumes from the 2001 sampling event (Attachment H) to the dissolved CVOC plumes from the August 2013 sampling event (Figures 2-4 through 2-11), it is apparent that the dissolved CVOCs have remained stable and not migrated in the direction of groundwater flow both in the shallow and deep environments. As such, there appears to be no immediate down-gradient receptors of contaminated groundwater adjacent to the site. Further evaluation of the trends of the target contaminants will be conducted as described in the projected milestone schedule (Section 5).

Referring to the historical analytical results (Table 2-5), it is apparent that the VOC constituents have reduced to concentrations much below delineation standards. Consequently, VOC migration is not a concern at this site.

As discussed in the preceding subsections, low levels of arsenic were found in the groundwater at the site. During the VIRP implementation, MTL will include metals for one round of routine groundwater sampling program to determine whether metals remain persistent and if so their potential for migration.

### 2.5.4 Sediment Migration Potential

Sediments can present a chronic discharge to surface waters. This pathway will be further evaluated during VRP.

### 2.5.5 Surface Water Migration Potential

Surface water contamination can accumulate in ponds or other surface impoundments or migrate to creeks and rivers. This pathway will be further evaluated during the VRP.

## 2.6 POTENTIAL RECEPTORS

### 2.6.1 Human Health Receptors

Since contaminated soil that exceeded the RRS was remediated, as discussed in Section 2.2, subsurface soil is neither a present concern to GPA employees nor to construction workers at the site. Consequently, only groundwater contamination presents potential human exposure at the site. Considering that the site and surrounding area are served by a municipal water supply system,

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[3] ***Seepage Velocity**: The actual rate of movement of fluid particles through porous media (Fetter, 1998).*

groundwater from the surficial aquifer is not being used for human consumption. GPA will also ensure that any construction works conducted within the area underlain by contaminated groundwater will be limited to the extent of the vadose zone.

GPA has indicated that the site will be utilized for its Container Gate 8 development involving construction of paved area over a significant portion of the site. Consequently, long-term human exposure to contaminated ground water is an unlikely exposure pathway. During the construction, however, there may be a short term exposure if construction works exposes previously unknown contaminated groundwater and soil at the site. MTL will perform hot spot removal of any such previously unknown contamination as described below in Section 4.2.2.

During the VIRP implementation, MTL will update the human health receptor evaluation with potential direct and indirect exposure potential based on additional knowledge gained. This will also include an evaluation of potential impact to guard houses or other superstructures that may be utilized for continuous human occupancy. MTL will also evaluate potential exposure to short-term site workers and maintenance personnel.

### 2.6.2 Ecological Receptors

MTL is currently not aware of any ecological receptors that would be affected by the residual multimedia contamination at the site. Considering that GPA plans to redevelop the site, the prevailing contamination is not expected to affect ecological receptors such as rare or endangered plants or animals after site redevelopment.

## 2.7 OTHER EXPOSURE PATHWAYS

As discussed in Section 2.4, groundwater is the primary pathway for migration of COCs at this site. Upon approval of the VIRP, any other exposure pathway(s) will be evaluated. MTL will, in particular, evaluate the potential for dermal contact to minimize exposure for personnel, contractors, and visitors that can be affected during and after site redevelopment activities being developed by GPA.

## 2.8 MODEL LIMITATIONS

The preliminary SCM, outlined in Section 2, describes the site condition based on available site data. During the VIRP process, MTL will further calibrate the SCM based on additional findings.

If sufficient data becomes available, a three-dimensional rendering of the contaminant plume(s) can be developed. Considering that the data pertaining to horizontal and vertical delineation were obtained from different monitoring dates, such a rendering was impractical during this VIRP preparation. MTL, however, included two-dimensional renderings of horizontal delineation in Section 2.3.

SECTION

3

# 3 CURRENT REMEDY

Following the initial diesel release and after additional sources of contamination were discovered in several AOCs, MTL successfully completed the site response activities outlined in Section 2.2. The following sections discuss the evolution of the site remedial response.

In March 1998, MTL prepared a compliance status report (CSR) and a corrective action plan (CAP). The CAP was later revised to address EPD's comments. According to EPD (2000), the revised CAP was approved on October 13, 1999. The CAP entailed removal of contaminated soils and remediation of contaminated groundwater with a PAT system.

In a joint meeting between MTL, GPA, and EPD held on October 23, 2000, EPD learned that GPA was in the process of acquiring the subject property and plans to cover the site with concrete or asphalt during its site redevelopment activities (EPD, 2000). Consequently, EPD requested MTL to modify the approved CAP to include the following:

1. Removal of source contamination above water table that exceeds RRS
2. Installation of additional extraction wells and provision for installing additional wells after site redevelopment.
3. Method for disposal of treated groundwater after site redevelopment.
4. A schedule for implementation of the modified CAP.
5. A progress report on the on-going groundwater treatment program and projected time to reach remedial end points after implementing the modified CAP.

In December 2000, GPA acquired the MTL property and the parties established a cleanup target date of June 30, 2010 to complete all remedial tasks. EPD recommended that MTL and GPA develop a strategy to address the site contamination consistent with GPA's site redevelopment goals. Subsequently, EPD requested that the parties jointly submit a modified CAP. MTL prepared several iterations of modified CAPs but was unable to obtain consensus from EPD and GPA on the technical approach and projected schedules. MTL's modified CAP did not meet EPD and GPA's approval.

## 3.1 SOIL REMEDIATION & CONFIRMATORY SAMPLING

As discussed in Section 2.2., MTL successively removed source contamination above water table. However, MTL's site contractors had only collected post excavation samples from selected locations with the excavations. EPD has required confirmation sampling from the limits of excavation to determine if all contaminated soils above RRS were removed from the respective AOCs (EPD, 2011).

## 3.2 GROUNDWATER REMEDIATION

As noted in Section 2.2, MTL initiated a groundwater remediation program involving PAT process. Initially groundwater was extracted from three recovery wells and treated. Gradually, the number of recovery wells were increased to a total of seven wells.

Currently, the PAT system extracts groundwater from seven wells identified as recovery wells (RW-1 through 5, RW-7, and MW-2D). For groundwater extraction some of the wells utilize submersible pumps and others use surface mounted centrifugal pumps with drop tubes. The extracted water is treated using a treatment train composed of a diffuse stripper and a column air stripping tower. The diffuse stripper is composed of a series of three 1,000-gallon polyethylene tanks equipped with micro-bubbler tubes. Extracted groundwater is pumped through the diffuse stripper and discharged to a 3,000 gallon holding tank. The effluent from the holding tank is conveyed to a 24-inch diameter, 23-foot packed, counter current-flow air stripping tower equipped with a 100 cubic feet per minute (cfm) air blower. The effluent from the air stripping tower is discharged by gravity to a percolation pond located to the south of the former Tire Shop.

### 3.2.1 PAT Performance

To evaluate the performance of the PAT system, EIC reviewed available historical groundwater recovery data. Based on the review it was apparent that recovery data for individual wells was unavailable. EIC observed, however, that Table 3 of the recent CAP modification document (SES, 2012a) included a compilation of total volume treated for various intervals during the period from April 1998 through August 2008. Utilizing this data, EIC prepared Table 3-1 that lists computations of the groundwater pumping rates. Referring to Table 3-1, it appears that the pumping rates ranged from 0.61 to 3.63 gallons per minute (gpm) from 3 to 7 seven wells with the exception of a brief period in 2003 when the pumping rates were reportedly 5.65 gpm. After Typical pumping rates would equate to a fraction of a gpm per well. Such recovery volumes would have minimal effect on plume treatment relative to the historical concentrations observed in the subsurface.

### 3.2.2 Natural Attenuation

Historical groundwater analytical results indicate the presence of typical CVOC degradation products such as cis 1,2-dichloroethylene (DCE) and vinyl chloride. Consequently, the CVOCs at the site appears to be undergoing microbially induced natural attenuation. Since data on pH, temperature, dissolved oxygen, oxidation reduction potential (ORP), and related indicator parameters is unavailable, EIC was unable to determine whether the natural attenuation is sustainable.

## 3.3 FEASIBILITY OF CONTINUING THE CURRENT PAT PROGRAM

In reviewing the PAT performance it is apparent that the remedial efficiency is very low. In addition, EIC discovered that the pumps are currently operating on a timer due to oversized pumps. A properly designed PAT will enable MTL to maintain continuous operation thereby extending a *cone of influence*[4] to steadily capture the groundwater contamination for treatment and remain hydraulically connected with the plume. Also, the effluent currently discharges to a percolation pond. Based on GPA's plans for site redevelopment, discharge to the percolation pond would not be allowed. An alternative course of action is therefore necessary to reach remedial end points. MTL has therefore developed the proposed action plan outlined in Section 4.

[4] ***Cone of Influence****: The depression, roughly conical in shape, produced in a water table by the pumping of water from a well (Fetter, 1998).*

SECTION

4

# 4 PROPOSED ACTION

Clearly, MTL has diligently retained several contractors to address the successive multimedia contamination discovered at the site. As discussed in Section 2, the predominant multimedia contamination that requires long-term remediation is dissolved CVOC. Any residual multimedia contamination that may be discovered during confirmation sampling can be addressed with limited source removal.

Typically, reaching remedial end points for dissolved CVOCs may extend for decades based on its concentrations and subsurface conditions. GPA's time line for site redevelopment has, however, presented a challenge for MTL to reach remedial end points on an accelerated schedule. In addition, the current CAP requires MTL to meet the most stringent drinking water standards, which places an undue burden for an industrial site. It is therefore clear that an alternative course of action is necessary to address the prevailing groundwater contamination.

## 4.1 PRACTICAL CONSIDERATIONS

### 4.1.1 Site Limitations

MTL understands that GPA has an imminent need to redevelop the site for locating the Container Gate 8 Development project. Based on the following site-specific limitations, however, MTL has determined that it is technically impractical to reach remedial end points within a short time frame to meet GPA's site redevelopment schedule:

1. Shallow groundwater limiting further multimedia source removal.
2. Complex hydrogeological condition with non-homogeneous and anisotropic properties limiting conventional remedial approach for treating groundwater contamination.
3. Inability to dispose effluent to Savannah River due to total maximum daily load (TMDL) restrictions
4. Lack of discharge locations within a reasonable distance to discharge effluent to sanitary sewers.

### 4.1.2 Plume Stability

Typically, dissolved contaminants tend to move with the groundwater flow. The average groundwater seepage velocity in the surficial aquifer (shallow subsurface) is approximately 0.16 feet per day (Farley-Jones, 1993) which equates to approximately 58 feet per year. In comparison to the original 2001 dissolved CVOC plume foot-prints (Attachment H) to those in August 2013 (Figures 2-4 through 2-11), however, it is apparent that the leading edge of the dissolved CVOC plumes have not migrated in the direction of ground water flow at the same rate of movement as the average seepage velocity. Also at a hydraulic conductivity value of 5.67 x 10-5 feet/day (Farley-Jones, 1993), the seepage velocity in the deeper subsurface was projected to be so slow that the formation was considered to be acting as a confining unit. The shallow and deeper plumes, therefore, appears to be attenuating, stable, and contained within the original foot-print.

### 4.1.3 Remedial Approach

Based on the preliminary site conceptual model discussed in Section 2 and the practical considerations outlined in Section 4.1, it is clear that an alternative approach under the Georgia VRP is the most practicable solution. To meet this goal, EIC has developed a conceptual approach as discussed in Section 4.2. This in situ remedial approach will not only enable MTL to reach remedial end points at a reasonable cost, but also within a time frame that enables GPA to proceed with its site redevelopment program.

## 4.2 PROPOSED ACTION

EIC's conceptual technical approach entails implementation of the following important tasks:

1. Complete delineation of multimedia contamination
2. Develop enhanced attenuation as an in situ remedy for the residual contamination
3. Implement the final remedy and monitor for the duration of the VRP.
4. Reach remedial end points and closure.

The following subsections provide additional material to further define the tasks.

### 4.2.1 Delineation of Multimedia Contamination

Recognizing GPA's imminent need for site redevelopment, MTL has defined specific areas of concern that need to be addressed thereby opening the remainder of the site for GPA's site redevelopment program. Within each AOC, where excavation was performed as discussed in Section 2, MTL will collect representative soil samples to confirm the limits of soil contamination within the soil excavations. In addition, MTL will collect representative groundwater samples to properly define the horizontal and vertical extent of groundwater contamination.

From the soil borings used for verifying the limits of excavation, MTL will also collect soil samples for sieve analysis used in properly designing recovery wells. The elevations of all soil borings will be collected using a professional land surveyor registered in the State of Georgia. During the soil borings, MTL will collect and analyze soil gas samples to define the potential for soil vapor that may be present within the AOCs. MTL will also collect surface water and sediment samples from the percolation pond to determine whether CVOCs present a potential concern for site redevelopment. A surface water ecological assessment will be completed to determine potential impacts.

Over the past several years, many site wells were destroyed from on-site activities. Currently, only 24 wells are accessible for groundwater monitoring event. Table 4-1 provides a well inventory with their current state of use. MTL will work with GPA in reconciling the responsible parties liable for repairing, re-drilling, or abandoning the respective wells. In addition, MTL will install additional sentinel wells or observation wells to determine plume stability and effectiveness of the long-term groundwater remediation program.

MTL will also design and install additional recovery wells to achieve maximum recovery efficiency. Within these wells, MTL will perform additional testing to determine aquifer characteristics such as hydraulic conductivity, seepage analysis, and optimum steady-state pumping rates.

As discussed in Section 4.2.2, the groundwater remediation program involves exfiltration of treated groundwater. For determining optimum exfiltration rates, MTL will conduct a pilot-test under the Class V Underground Injection Control (UIC) program.

### 4.2.2 Enhanced Attenuation of Residual Contamination

Until the site delineation program outlined in Section 4.2.1 is complete and GPA presents its final site redevelopment plans, MTL is unable to develop detailed design specifications for the enhance attenuation of the residual contamination to meet the cleanup goals. Nonetheless, the conceptual remedial design entails two important tasks as follows:

1. Removal of principal threats through hot spot removal or other cost effective attenuation mechanisms accounting for GPA's site redevelopment program
2. Enhanced attenuation of residual groundwater integrating GPA's site redevelopment layout.

Currently, the subsurface beneath the former concrete floor within the Tire Shop and the partially damaged drainage culvert are the primary focus of hot spot removal. Any residual contamination exceeding the RRS under the Tire Shop floor will be excavated after GPA removes the current superstructure. Immediately after the VIRP is approved, however, MTL will proceed with the removal or abandonment of the abandoned storm water pipes and drainage culvert. The soil around the pipeline and culvert will be sampled to determine whether COCs have migrated into the adjacent subsurface environments. Any soil contamination exceeding the RRS will be removed.

Any soil excavation activities will be limited to the subsurface within the vadose zone. MTL will also address any additional multimedia contamination such as surface water or sediment contamination that may be discovered during site delineation. Any excavation or depressions resulting from the aforementioned tasks will be backfilled to natural conditions by GPA and/or MTL.

Depending on the analytical results of the multimedia samples, MTL may consider installing a passive soil gas conveyance system or a vapor barrier for preventing vapor exposure concerning site workers. Any such conveyance system will be installed within the vadose zone.

To address the prevailing groundwater remediation, MTL will utilize an Enhanced Attenuation System (EAS). This program entails steady-state extraction of contaminated water from a series of recovery wells within the CVOC foot-print and reinjection of treated water with or without nutrient addition to promote attenuation. Figures 4-1 and 4-2 present a conceptual layout of the plan and sectional view of the EAS and the optional vapor venting system. MTL will also conduct a capture zone analysis to ensure that the pumping program addresses the prevailing groundwater contamination.

The extracted water will be conveyed to a groundwater treatment system (GTS) for treatment and the treated effluent will be conveyed to an exfiltration trench. The GTS will be designed based on aquifer characteristics and contaminant concentrations. Depending on the levels of residual multimedia contamination, MTL may consider addition of nutrient or other enrichments to the treated effluent to accelerate the time to reach remedial end points in a reasonable time frame.

The exfiltration system, located hydraulically upgradient of the prevailing CVOC plume, will return the treated water to the subsurface through below-grade discharge pipes located hydraulically upgradient of the treatment zone. For redundancy, MTL will install additional pipes beyond the required flow capacity. This redundancy will ensure that additional standby convenience pipes are available in the event that the primary discharge pipe is blocked or is operating in reduced discharge efficiency.

To ensure continuous operation of the in situ remedial system and to maintain hydraulic control of the groundwater plume, MTL will consider utilizing automation and SCADA communication. The SCADA system will allow MTL to monitor the GTS and provide immediate notification of system breakdown thereby enhancing the remedial efficiency. After installation and testing of the final EAS, a detailed operation and maintenance program will be developed.

MTL understands that the entire subsurface structures used in the in situ groundwater treatment process will be located beneath GPA's surface improvements. MTL will work with GPA in locating sufficient access points at mutually beneficial locations within the site. Also, MTL will work with GPA in identifying an ideal location for the installation of a remediation building that will be used to house the GTS. MTL will utilize GPA's power source to operate the GTS.

MTL understands that GPA fosters environmentally sustainable site improvements. The site redevelopment would therefore result in certain landscaped areas. If these areas are ideally located in areas that have a potential to augment MTL's in situ remediation process, MTL will work with GPA in developing phytoremediation based-landscaping solutions within GPA's planned improvements consistent with EPD's recommendation (EPD, 2013). Depending on the final site layout, phytoremediation may also serve as a contingency solution in the event that the CVOCs are likely to migrate beyond the capture zone. MTL will rely on GPA's management program for maintaining the landscape.

To protect onsite and construction workers from potential exposure of multimedia environmental contamination, MTL will develop a site safety plan. GPA can utilize the safety plan in developing protocols for site safety.

#### 4.2.3 Implementation and Monitoring Program

Upon implementation of the final design, MTL will conduct a routine monitoring program to ensure that the system operates as designed. Available wells within and outside the known contaminant plume, will be utilized for verifying plume stability and attenuation monitoring during the course of the VRP. Groundwater sampling will be conducted as follows:

1. Samples will be collected from the wells on a quarterly basis during the first year and semiannual basis thereafter.
2. Samples will be collected utilizing established low-flow sampling techniques or appropriate alternative technique approved by EPD consistent with EPA Publication SW846 and EPA Region IV Field Branches Quality System and Technical Procedures (FBQSTP), Groundwater Sampling (SESDPROC-301-R3)(EPA, 2013).
3. In addition to CVOC trend analysis, MTL will monitor other indicator parameters such as pH, DO, ORP, and other inorganic parameters that serve as important metrics in determining the change in site conditions and the effectiveness of the attenuation program. For additional insight into the subsurface conditions, MTL may utilize down-hole monitoring devices.

Utilizing the data generated from these monitoring events, MTL will periodically review performance metrics outlined in Section 4.3. EIC will also develop and implement an operation and maintenance program to ensure continuous operation of the EAS for the duration of the VRP.

#### 4.2.4 Reach Remedial End Points and Closure

Upon completion of remedial activities, MTL will submit to the EPD a CSR establishing that the remedial endpoint was reached as per the VIRP and certify that the property is in compliance with the remedial standards. MTL understands that, at any time before the CSR is submitted, the EPD can terminate MTL's enrollment in the VRP if the EPD determines that MTL failed to properly follow the Voluntary Remediation Plan requirements or that continued enrollment will lead to an "imminent or substantial danger to human health and the environment." If the EPD determines that the CSR is compliant with the "provisions, purposes, standards, and policies" of the VRP, the EPD will deem the site to be compliant with groundwater RRS.

## 4.3 PERFORMANCE METRICS

To determine the effectiveness of the selected remedy, MTL will periodically perform a two-dimensional concentration/time analysis of the groundwater analytical data to address the following performance metrics:

- Is the plume stable or shrinking?
- Is there an ongoing source of onsite or off-site contamination that is contributing to the prevailing plume?
- Is the contaminant flux meeting remedial goals and is sustainable?
- Is the prevailing remedy practical and cost-effective?
- Is the projected time frame to reach remedial objectives acceptable?

### 4.3.3 Fate and Transport Model

MTL will utilize the site data to demonstrate that the enhanced attenuation is sufficient to achieve compliance with the RRS. In particular, MTL will utilize the U.S.EPA OSWER Directive 9200.4-17P "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites," as a resource to demonstrate plume stability and attenuation mechanisms.

MTL will conduct a two-dimensional analysis of contaminant trends and indicator parameters trends to demonstrate whether the site is meeting the performance metrics. In addition, MTL will utilize a three-dimensional fate and transport model to evaluate the effect of dispersion, advection, sorption, and biodegradation. If the analysis is insufficient in addressing the performance metrics, MTL will consider statistical analysis to determine the performance metrics. If these tools indicate that the prevailing remedial strategy is unable to meet the performance metrics, contingency tasks will be initiated to develop an appropriate remedy.

### 4.3.4 Supplemental Data

Depending on the results of the groundwater monitoring program, MTL will consider collecting supplemental data from compound specific isotope analysis (CSIA), enzyme activity probes (EAP), down-hole implants, or microcosm tests to demonstrate multiple lines of evidence on rates of attenuation.

## 4.4 UPDATED RRS

During the preparation of the VIRP application, MTL computed Type 4 risk RRSs for groundwater based on non-residential properties using EPA's Risk Assessment Guidance for Superfund (RAGS) equations 1 and 2, in conformance with Georgia EPD Rule 391-3-19. In calculating RRS, MTL utilized the current COC associated with the PCE release, the known site conditions and the latest regional screening level values (RSL) data published by the U.S. Environmental Protection Agency

(EPA) in May 2013. This resulted in default Type 3 RRS values as the applicable values for soil. During the VIRP implementation, MTL will determine whether soil and groundwater RRS values can be improved based on prevailing site conditions, knowledge gained from the updated site conceptual model, or other applicable criteria.

## 4.5 CONTINGENCY PLANNING

Although the current PAT system is not operating at optimal efficiency, the groundwater contaminant plume is relatively stable. It appears therefore that bioremediation may be a dominant natural attenuation mechanism at the site. The EAS is designed to increase the overall attenuation process to reach remedial end points. If the EAS is unable to attenuate the dissolved CVOCs, within the projected VIRP schedule, MTL will conduct a microcosm test to verify if augmentation is feasible.

As an additional contingency measure, MTL will implement a unique pulse-extraction process (PEP) to enhance the attenuation process. The PEP entails alternatively exposing and flooding the treatment zone at certain frequency thereby promoting a more rapid attenuation of the residual contamination in the saturated zone. If this process is required, explicit process details will be proposed during the VIRP implementation program.

If MTL determines that the contaminant plume is expanding beyond the point of demonstration after the EAS implementation, MTL will meet with the EPD for contingency measures that may involve an alternative or modified remedial strategy. Also, if other COCs such as arsenic remain persistent, MTL will work with the potentially responsible party in developing a remedial solution for such COCs.

## 4.5 QUALITY ASSURANCE AND QUALITY CONTROL

To overcome EPD's historical concern over data and report quality, MTL will follow the guidance outlined in the latest version of "The Field Branches Quality System and Technical Procedures" published by the United States Environmental Protection Agency Region IV. All reports will be thoroughly reviewed to eliminate errors and omissions.

SECTION 5

# 5 SCOPE & SCHEDULE

MTL will complete the proposed actions in a 5-step project schedule. Figure 5-1 presents a Gantt Chart for MTL's Projected Schedule. The following sections outline the key tasks.

## 5.1 DELINEATION

Within the first 12 months of participation in the program, MTL will conduct the following:

1. Develop site-specific health and safety plan to protect site workers from potential exposure of multimedia environmental contamination.
2. Confirm the actual horizontal and vertical coordinates of wells and site features based on survey data from professional land surveyor.
3. Perform post-excavation confirmation sampling to define the limits of excavation.
4. Collect other multimedia samples to delineate the extent of COCs in the respective AOCs.
5. Conduct an investigation to identify the potential source of arsenic contamination.
6. Collect samples to determine indicator parameters that verifies natural attenuation.
7. Perform quarterly groundwater monitoring program to analyze for CVOCs and evaluate plume stability.
8. Rehabilitate selected missing or damaged wells.
9. Determine site-specific aquifer characteristics.
10. Perform a capture zone analysis to determine the number of recovery wells and pumping rates required for effective treatment of groundwater.
11. Update SCM with the most current data.
12. Re-evaluate RRS values, based on site-specific risk factors.
13. Meet with GPA to discuss preliminary EAS design and layout consistent with GPA's site redevelopment program.
14. Submit reports to the EPD following the VIRP reporting requirements and the Projected Milestone Schedule.

## 5.2 ENHANCED ATTENUATION

Within the first 24 months of participation in the program, MTL will conduct the following:

1. Analyze data collected, determine trends, refine horizontal and vertical delineation of the contaminant plume, and develop the most cost effective strategy for MTL to reach its remedial goals.
2. Design and install additional recovery wells based on results of the site delineation tasks outlined in step 1.
3. Install additional sentinel well(s) if required.
4. Perform groundwater recharge tests under UIC Class V permit program.
5. Meet with GPA to finalize EAS design and layout. MTL will also work with GPA in developing preventive measures to protect wells and below-grade conveyance systems during and after GPA's site redevelopment program.
6. Coordinate with GPA on the removal of hot spots under Tire Shop and selected locations.
7. Excavate the damaged drainage culvert and coordinate with GPA on backfilling.
8. Coordinate with GPA on installation of the soil vapor venting lines (if required) and EAS.
9. In consultation with GPA, evaluate the feasibility of implementing phytoremediation-based landscape system.
10. Prepare a final site safety plan and protocols to protect onsite and construction workers from potential exposure of multimedia environmental contamination.
11. Perform semi-annual groundwater monitoring program to analyze for CVOCs and evaluate plume stability.
12. Submit reports to the EPD following the VIRP reporting requirements and the Projected Milestone Schedule.

## 5.3 MONITORING PROGRAM

Within the first 30 months of participation in the program, MTL will conduct the following:

1. Utilizing the EAS monitoring data, evaluate trends to determine if the CVOCs are progressively reducing such that the RRS will be met in a reasonable time frame.
2. In concurrence with EPD, select a fate and transport model to evaluate compliance with site-specific RRS.
3. If the site data concludes that EAS would be unable to reach remedial end points within the projected 60-month time schedule, develop a conceptual plan for contingency remedy.
4. Meet with GPA to discuss preliminary remedial progress.
5. Submit reports to the EPD following the VIRP reporting requirements and the Projected Milestone Schedule.

## 5.4 EA CONFIRMATION

Within the first 30 months of participation in the program, MTL will conduct the following:

1. Update the site conceptual model with information gained in Sections 5.1 and 5.2.
2. If EAS appears unfeasible in meeting projected remedial goals, conduct a microcosm test to determine enhancements to increase the biodegradation potential of CVOCs. The results of the microcosm test may also lead to other alternative remedial technologies to reach remedial end points.
3. In addition to microcosm testing, consider development of a PEP-based remedy.
4. Finalize the remediation plan
5. Provide a preliminary cost estimate for implementing remediation and associated tasks.
6. Implement contingency measures to reach remedial end points.
7. Meet with GPA to discuss remedial end points.
8. Perform semi-annual groundwater monitoring program to analyze for CVOCs and evaluate plume stability.
9. Submit reports to the EPD following the VIRP reporting requirements and the Projected Milestone Schedule.

## 5.5 SITE CLOSURE

Within the first 60 months of participation in the program, MTL will conduct the following:

1. Meet with GPA to confirm remedial end points and post-closure program.
2. Submit a CSR with mandatory certifications.
3. Initiate a post-closure monitoring program.
4. Perform semi-annual groundwater monitoring program to analyze for CVOCs and evaluate plume stability.
5. Submit reports to the EPD following the VIRP reporting requirements and the Projected Milestone Schedule.

SECTION

6

# 6 REFERENCES


Farley-Jones and Associates (Farley-Jones), 1993. *Contaminant Assessment Report, Port Wentworth, Georgia Terminal.* Tallahassee, Florida, December 8, 1993.

Farley-Jones & Associates, 1994. *RE: McKenzie Tank Lines, Inc., Contamination Assessment Report Addendum, Port Wentworth, Georgia Terminal, Consent Order EPD-WQ-1896*. Tallahassee, Florida, April 1994.

Fetter, C.W. , 1988. *Applied Hydrogeology, Second Edition.* Merrill Publishing Company, Columbus, Ohio, 1988.

G. B. Robbins, Inc. and D. L. Smith & Associates, 1992. *Contamination Assessment Plan, McKenzie Tank Lines, Inc., 111 Grange Road, Port Wentworth, Georgia.* Jacksonville, Florida, 10 August 1992.

G. B. Robbins, Inc., 1993. *RE: McKenzie Tank Lines, Inc., Port Wentworth, Georgia Terminal.* Status report correspondence from Geraldine Robbins. Jacksonville, Florida, 14 May 1993.

Georgia Department of Natural Resources, Georgia Environmental Protection Division (EPD), 2000. *RE: Request for Modified Corrective Action Plan, McKenzie Tank Lines, HSI # 10406, Savannah,* Correspondence from Jane Hendricks, Atlanta, Georgia, November 27, 2000.

Georgia Department of Natural Resources, Georgia Environmental Protection Division (EPD), 2011. *RE: April 2011 Corrective Action Plan, Modification, McKenzie Tank Lines, HSI # 10406, Savannah,* Correspondence from David Brownlee, Atlanta, Georgia, October 4, 2001.

Georgia Department of Natural Resources, Georgia Environmental Protection Division (EPD), 2000. *RE: CSR & CAP Notice of Deficiency (NOD), McKenzie Tank Lines, HSI#10406,* Correspondence from Jane Hendricks, Atlanta, Georgia, 31 October 2005.

Georgia Department of Natural Resources, Environmental Protection Division, 2012. *RE: Notice of Deficiency, McKenzie Tank Lines, Site HSI #10406,* Correspondence from David Brownlee, Unit Coordinator, Response and Remediation Program. Atlanta, Georgia, 18 March 2008.

Georgia Department of Natural Resources, Environmental Protection Division, 2012. *RE: April 2011 Corrective Action Plan Modification, McKenzie Tank Lines, Site HSI #10406, Port Wentworth, Chatham County, Georgia*. Correspondence from David Brownlee, Unit Coordinator, Response and Remediation Program. Atlanta, Georgia, 4 October 2011.

Georgia Department of Natural Resources, Environmental Protection Division, 2012. *RE: Notice of Violation – Corrective Action Plan, McKenzie Tank Lines, Site HSI # 10406, Port Wentworth, Chatham County, Georgia*. Correspondence from David Brownlee, Unit Coordinator, Response and Remediation Program. Atlanta, Georgia, August 2, 2012.

Georgia Department of Natural Resources, Environmental Protection Division, 2012. *RE: Record of Communication-September 10, 2013, 10:00 a.m. Meeting Minutes, McKenzie Tank Lines, Site HSI # 10406, Port Wentworth, Chatham County, Georgia*. Correspondence from Kevin Collins, Geologist, Response and Remediation Program. Atlanta, Georgia, September 12, 2013.

Geovac Environmental Services, Inc., 2001a. *RE: McKenzie Tank Lines Savannah Terminal, 111 Grange Road, Port Wentworth, GA. HIS Number 10406*. Correspondence from John Elrod, Principal Geologist. Jacksonville, Florida, April 10, 2001.

Geovac Environmental Services, Inc., 2001b. *RE: CSR Notice of Deficiency, former McKenzie Tank Lines Terminal, 111 Grange Road, Port Wentworth, GA.; HSI # 10406*. Correspondence from John Elrod, Principal Geologist. Jacksonville, Florida, December 20, 2001.

Geovac Environmental Services, Inc., 2002. *Compliance Status Report, McKenzie Tank Lines, Savannah Terminal, 111 Grange Road, Port Wentworth, GA., HIS# 10406*. Jacksonville, Florida, February 28, 2002.

Geovac Environmental Services, Inc., 2005. *RE: Responses to May 31, 2005 CSR Notice of Deficiency, McKenzie Tank Lines Site, 111 Grange Road, HSI #10406*. Correspondence from John Elrod, Principal Geologist. Jacksonville, Florida, August 30, 2005.

Geovac Environmental Services, Inc., 2008. *RE: Response to March 18, 2008 Notice of Deficiency, McKenzie Tank Lines, Inc. Site, 111 Grange Road, Garden City, GA. HIS# 10406*. Correspondence from John Elrod, Principal Geologist. Jacksonville, Florida, June 3, 2008.

Geovac Environmental Services, Inc., 2011a. *RE: Grange Road Soil Evaluation due to Pipe Break*. Correspondence from John Elrod, Principal Geologist. Jacksonville, Florida, January 12, 2011.

Geovac Environmental Services, Inc., 2011b. *RE: Former McKenzie Tank Lines, 111 Grange Road, Port Wentworth GA., HSI# 10406*. Correspondence from John Elrod, Principal Geologist, and Robert Schuster, P.E. Jacksonville, Florida, May 4, 2011.

Geovac Environmental Services, Inc., 2012. *RE: Semi-Annual Report, McKenzie Tank Lines, Site HSI #10406, Port Wentworth, Chatham County, Georgia*. Jacksonville, Florida August 31, 2012.

Geovac Environmental Services, Inc., (Geovac) 2013. *Semi-Annual REport, McKenzie Tank Lines, Site HSI #10406 Port Wentworth, Chatham County, Georgia*, Jacksonville, Florida, May 10, 2013.

Handex of Florida, Inc., 1998. *Compliance Status Report, Hazardous Site Inventory Number 10406*. Port Wentworth, Georgia, March 1998.

Southern Engineering Services, Inc.(SES), Geovac Environmental Services, Inc., 2006. *Compliance Status Report, McKenzie Tank Lines, Savannah Terminal, 111 Grange Road, Port Wentworth, GA., HSI #10406*. Jacksonville, Florida, January 31, 2006.

Southern Engineering Services, Inc.(SES), 2011. *RE: McKenzie Tank Lines, Inc., 111 Grange Road, Port Wentworth, Georgia, CAPM Supplement, HSI #10406*. Jacksonville, Florida, June 20, 2011.

Southern Engineering Services, Inc.(SES), 2012. *RE: McKenzie Tank Lines, Inc., 111 Grange Road, Port Wentworth, Georgia, Interim Actions, HSI #10406*. Correspondence from Robert Schuster, P.E. Jacksonville, Florida, February 27, 2012.

Southern Engineering Services, Inc. (SES), 2012a. *Corrective Action Plan Modification, 111 Grange Road, HSI # 10406*, Jacksonville, Florida, June 2012.

WPC, 2009. *Limited Site Investigation, Former McKenzie Holding Pond, Port Wentworth, Georgia, WPC Project # WPC3409.00104*. Savannah, Georgia, November 6, 2009.

# VIRP APPLICATION

## TABLES

## Table 1-1: Site Delineation Concentration Criteria for Soil

| Constituents | CAS No. | Delineation Criteria, (µg/Kg) |
|---|---|---|
| Tetrachloroethene | 127-18-4 | 180 |
| Trichloroethene | 79-01-6 | 130 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 530 |
| Vinyl chloride | 75-01-4 | 40 |
| | | |
| Benzene | 71-43-2 | 20 |
| Ethylbenzene | 100-41-4 | 20,000 |
| Toluene | 108-88-3 | 14,400 |
| Total Xylenes | 133-02-07 | 20,000 |

Derived from Table 1, App I or Background, or Detection Limit (from GA EPD 391-3-19)

**Table 1-2: Site Delineation Concentration Criteria for Groundwater**

| Constituents | CAS No. | Delineation Criteria, (µg/L) |
|---|---|---|
| Tetrachloroethene | 127-18-4 | 5 |
| Trichloroethene | 79-01-6 | 5 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 70 |
| Vinyl chloride | 75-01-4 | 2 |
| | | |
| Benzene | 71-43-2 | 5 |
| Ethylbenzene | 100-41-4 | 700 |
| Toluene | 108-88-3 | 1,000 |
| Total Xylenes | 133-02-07 | 10,000 |
| | | |
| Chromium | 744-04-73 | 100 |

Derived from Table 1, App III or Background, or Detection Limit (from GA EPD 391-3-19)

## Table 1-3: Final Type 4 Risk Reduction Standards for Soil

| Constituents | CAS No. | Final Type 4 Surface Soil RRS | Final Type 4 Subsurface Soil RRS |
|---|---|---|---|
| | | (µg/kg) | (µg/kg) |
| Tetrachloroethene | 127-18-4 | 500 | 500 |
| Trichloroethene | 79-01-6 | 500 | 500 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 7,000 | 7,000 |
| Vinyl chloride | 75-01-4 | 200 | 200 |
| | | - | - |
| Benzene | 71-43-2 | 500 | 500 |
| Ethylbenzene | 100-41-4 | 70,000 | 70,000 |
| Toluene | 108-88-3 | 100,000 | 100,000 |
| Total Xylenes | 1330-20-7 | 917,731 | 1,000,000 |

Note: Final RRS values were derived from the highest of the Type 3 and Type 4 values listed in Table 1-4

## Table 1-4: Comparison of Risk Reduction Standards for Soil

| Constituents | CAS No. | Type 3 Surface Soil RRS from Table 1-6 | Type 3 Subsurface Soil RRS from Table 1-6 | Type 4 Surface Soil RRS from Table 1-5 | Type 4 Subsurface Soil RRS from Table 1-5 |
|---|---|---|---|---|---|
| | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| Tetrachloroethene | 127-18-4 | 500 | 500 | 45 | 45 |
| Trichloroethene | 79-01-6 | 500 | 500 | 2 | 2 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 7,000 | 7,000 | 60 | 60 |
| Vinyl chloride | 75-01-4 | 200 | 200 | 1 | 1 |
| | | | | | |
| Benzene | 71-43-2 | 500 | 500 | 4 | 4 |
| Ethylbenzene | 100-41-4 | 70,000 | 70,000 | 785 | 785 |
| Toluene | 108-88-3 | 100,000 | 100,000 | 3,627 | 3,627 |
| Total Xylenes | 1330-20-7 | 917,731 | 1,000,000 | 9,847 | 9,847 |

## Table 1-5: Type 4 Risk Reduction Standards for Soil [Rule 391-3-19-.07(9)(d)]

| Constituents | CAS No. | RAGS (Equation 7 from Table 1-7) Non-Carcinogenic Adult | RAGS (Equation 6 from Table 1-8) Carcinogenic Adult | Lesser of values from Equations 6 and 7 | Subsurface Leaching Criteria (from Table 1-9) | Surface Soil Type 4 RRS | Subsurface Soil Type 4 RRS |
|---|---|---|---|---|---|---|---|
| | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Tetrachloroethene | 127-18-4 | 1.44E+02 | 3.87E+02 | 1.44E+02 | 4.46E-02 | 4.46E-02 | 4.46E-02 |
| Trichloroethene | 79-01-6 | 9.43E+02 | 2.35E+01 | 2.35E+01 | 1.87E-03 | 1.87E-03 | 1.87E-03 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 3.15E+03 | NC | 3.15E+03 | 6.01E-02 | 6.01E-02 | 6.01E-02 |
| Vinyl chloride | 75-01-4 | 1.43E+02 | 8.32E+00 | 8.32E+00 | 1.13E-03 | 1.13E-03 | 1.13E-03 |
| | | | | | | | |
| Benzene | 71-43-2 | 1.63E+02 | 1.95E+01 | 1.95E+01 | 4.47E-03 | 4.47E-03 | 4.47E-03 |
| Ethylbenzene | 100-41-4 | 8.53E+03 | 9.79E+01 | 9.79E+01 | 7.85E-01 | 7.85E-01 | 7.85E-01 |
| Toluene | 108-88-3 | 2.79E+04 | NC | 2.79E+04 | 3.63E+00 | 3.63E+00 | 3.63E+00 |
| Total Xylenes | 1330-20-7 | 9.18E+02 | NC | 9.18E+02 | 9.85E+00 | 9.85E+00 | 9.85E+00 |

**Notes:**

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of "NC" was given when both parameters were not defined, due to the inability to divide an equation by zero.

# Table 1-6: Type 3 Risk Reduction Standards for Soil [Rule 391-3-19-.07(8)(d)]

| Constituents | CAS No. | RAGS (Equation 7 from Table 1-7) Non-Carcinogenic Adult | RAGS (Equation 6 from Table 1-8) Carcinogenic Adult | 1. Notification Concentration (Appendix I) | 2. Type 1 Groundwater Value Multiplied by 100 | 3. TCLP | A. Lesser of values from Equations 6 and 7 | B. Greatest of Values from 1, 2, and 3 | C. Lesser of Values from A and B | Subsurface Soil Type 3 RRS (From Column B) | Surface Soil Type 3 RRS (From Column C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Tetrachloroethene | 127-18-4 | 1.44E+02 | 3.87E+02 | 1.80E-01 | 5.00E-01 | NA | 1.44E+02 | 5.00E-01 | 5.00E-01 | 5.00E-01 | 5.00E-01 |
| Trichloroethene | 79-01-6 | 9.43E+02 | 2.35E+01 | 1.30E-01 | 5.00E-01 | NA | 2.35E+01 | 5.00E-01 | 5.00E-01 | 5.00E-01 | 5.00E-01 |
| 1,2-Dichloroethene (cis | 156-59-2 | 3.15E+03 | NC | 5.30E-01 | 7.00E+00 | NA | 3.15E+03 | 7.00E+00 | 7.00E+00 | 7.00E+00 | 7.00E+00 |
| Vinyl chloride | 75-01-4 | 1.43E+02 | 8.32E+00 | 4.00E-02 | 2.00E-01 | NA | 8.32E+00 | 2.00E-01 | 2.00E-01 | 2.00E-01 | 2.00E-01 |
| | | | | | | | | | | | |
| Benzene | 71-43-2 | 1.63E+02 | 1.95E+01 | 2.00E-02 | 5.00E-01 | NA | 1.95E+01 | 5.00E-01 | 5.00E-01 | 5.00E-01 | 5.00E-01 |
| Ethylbenzene | 100-41-4 | 8.53E+03 | 9.79E+01 | 2.00E+01 | 7.00E+01 | NA | 9.79E+01 | 7.00E+01 | 7.00E+01 | 7.00E+01 | 7.00E+01 |
| Toluene | 108-88-3 | 2.79E+04 | NC | 1.44E+01 | 1.00E+02 | NA | 2.79E+04 | 1.00E+02 | 1.00E+02 | 1.00E+02 | 1.00E+02 |
| Total Xylenes | 1330-20-7 | 9.18E+02 | NC | 2.00E+01 | 1.00E+03 | NA | 9.18E+02 | 1.00E+03 | 9.18E+02 | 1.00E+03 | 9.18E+02 |

**Notes:**

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of "NC" was given when both parameters were not defined, due to the inability to divide an equation by zero.

NA=Data not Available

## Table 1-7: Non-Carcinogenic Evaluation for Soil; Non-Residential Adult (RAGS Equation 7)

| Constituents | CAS No. | Target Hazard Index (THI) | Body Weight (BW) | Averaging Time (AT) | Conversion Factor (CF) | Exposure Frequency (EF) | Exposure Duration (ED) | Ingestion Rate of Soil (Irs) | Oral Reference Dose (RfDo) | Inhalation Rate of Air (Ira) | Particulate Emission Factor (PEF) | Volatilization Factor (VF) | Inhaltion Reference Dose (RfDi) (from Table 1-10) | RAGS (Equation 7) Non-Carcinogenic Adult | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (kg) | (yr) | (d/yr) | (d/yr) | (yr) | (mg/d) | (mg/kg-d) | ($m^3$/d) | ($m^3$/kg) | ($m^3$/kg) | (mg/kg-d) | (mg/kg) | |
| Tetrachloroethene | 127-18-4 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 6.00E-03 | 20 | 1.40E+09 | 2.50E+03 | 1.14E-02 | 1.44E+02 | |
| Trichloroethene | 79-01-6 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 5.00E-04 | 20 | 1.40E+09 | 2.40E+03 | 0 | 9.43E+02 | |
| 1,2-Dichloroethene (cis) | 156-59-2 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 2.00E-03 | 20 | 1.40E+09 | 2.70E+03 | 0 | 3.15E+03 | |
| Vinyl chloride | 75-01-4 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 3.00E-03 | 20 | 1.40E+09 | 1.00E+03 | 2.86E-02 | 1.43E+02 | |
| | | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 4.00E-03 | 20 | 1.40E+09 | 3.80E+03 | 8.57E-03 | 1.63E+02 | |
| Ethylbenzene | 100-41-4 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 1.00E-01 | 20 | 1.40E+09 | 6.10E+03 | 2.86E-01 | 8.53E+03 | |
| Toluene | 108-88-3 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 8.00E-02 | 20 | 1.40E+09 | 4.60E+03 | 1.43E+00 | 2.79E+04 | |
| Total Xylenes | 1330-20-7 | 1 | 70 | 25 | 365 | 250 | 25 | 50 | 2.00E-01 | 20 | 1.40E+09 | 6.30E+03 | 2.86E-02 | 9.18E+02 | |

**Notes:**
*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of 'NC' was given when both parameters were not defined, due to the inability to divide an equation by zero.

kg = kilogram; yr = year; d/yr = days per year; mg/d = milligrams per day; kg/mg = kilograms per milligram; mg/kg-d = milligram per kilogram day; m3/d =cubic meters per day;
mg/kg = milligrams per kilograms

# Table 1-8: Carcinogenic Evaluation for Soil; Non-Residential Adult (RAGS Equation 6)

| Constituents | CAS No. | Target Excess Risk (TR) | Body Weight (BW) | Averaging Time (AT) | Conversion Factor (CF) | Exposure Frequency (EF) | Exposure Duration (ED) | Ingestion Rate of Soil (Irs) | Oral Cancer Slope Factor (Sfo) | Ingestion Rate of Air (Ira) | Particulate Emission Factor (PEF) | Volatilization Factor (VF) | Inhalation Cancer Slope Factor (Sfi) (from Table 1-10) | RAGS (Equation 6) Carcinogenic Adult | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (kg) | (yr) | (d/yr) | (d/yr) | (yr) | (mg/d) | $(mg/kg\text{-}d)^{-1}$ | $(m^3/d)$ | $(m^3/kg)$ | $(m^3/kg)$ | $(mg/kg\text{-}d)^{-1}$ | (mg/kg) | |
| Tetrachloroethene | 127-18-4 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 2.10E-03 | 20 | 1.40E+09 | 2.50E+03 | 9.10E-04 | 3.87E+02 | |
| Trichloroethene | 79-01-6 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 4.60E-02 | 20 | 1.40E+09 | 2.40E+03 | 0.01435 | 2.35E+01 | |
| 1,2-Dichloroethene (cis) | 156-59-2 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 0 | 20 | 1.40E+09 | 2.70E+03 | 0.00E+00 | NC | *See Notes below |
| Vinyl chloride | 75-01-4 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 7.20E-01 | 20 | 1.40E+09 | 1.00E+03 | 0.0154 | 8.32E+00 | |
| | | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 5.50E-02 | 20 | 1.40E+09 | 3.80E+03 | 0.0273 | 1.95E+01 | |
| Ethylbenzene | 100-41-4 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 1.10E-02 | 20 | 1.40E+09 | 6.10E+03 | 0.00875 | 9.79E+01 | |
| Toluene | 108-88-3 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 0 | 20 | 1.40E+09 | 4.60E+03 | 0 | NC | *See Notes below |
| Total Xylenes | 1330-20-7 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 50 | 0 | 20 | 1.40E+09 | 6.30E+03 | 0 | NC | *See Notes below |

**Notes:**

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of 'NC' was given when both parameters were not defined, due to the inability to divide an equation by zero.

kg = kilogram; yr = year; d/yr = days per year; mg/d = milligrams per day; kg/mg = kilograms per milligram; mg/kg-d = milligram per kilogram day; m3/d =cubic meters per day; mg/kg = milligrams per kilogram

# Table 1-9: Soil to Groundwater Leachability (Equation 4-10)

| Constituents | CAS No. | Soil Organic Carbon/Water Partition Coefficient ($K_{oc}$)[a] | Fraction Organic Carbon in Soil ($f_{oc}$)[b] | Soil-Water Partition Coefficient ($K_d$)[c] | Water-filled Soil Porosity ($\theta_w$)[b] | Air-filled Soil Porosity ($\theta_a$) | Dry Soil Bulk Density ($\rho_b$)[b] | Soil Particle Density ($\rho_s$)[b] | Soil Porosity (n) | Henry's Law Constant (H)[a] | Dilution Attenuation Factor (DAF)[d] | Higher of Type 3 and 4 groundwater RRS (from table 1-11) | Target Soil Leachate Concentration ($C_w$) | Subsurface Leaching Criteria (Equation 4-10) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (L/kg) | (g/g) | (L/kg) | ($L_{water}/L_{soil}$) | ($L_{air}/L_{soil}$) | (kg/L) | (kg/L) | ($L_{pore}/L_{soil}$) | | | (mg/L) | (mg/L) | (mg/kg) | |
| Tetrachloroethene | 127-18-4 | 9.49E+01 | 0.002 | 1.90E-01 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 7.24E-01 | 1 | 0.098 | 9.81E-02 | 4.46E-02 | |
| Trichloroethene | 79-01-6 | 6.07E+01 | 0.002 | 1.21E-01 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 4.03E-01 | 1 | 0.005 | 5.24E-03 | 1.87E-03 | |
| 1,2-Dichloroethene (cis) | 156-59-2 | 3.96E+01 | 0.002 | 7.92E-02 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 1.67E-01 | 1 | 0.204 | 2.04E-01 | 6.01E-02 | |
| Vinyl chloride | 75-01-4 | 2.17E+01 | 0.002 | 4.35E-02 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 1.14E+00 | 1 | 0.003 | 3.27E-03 | 1.13E-03 | |
| | | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 1.46E+02 | 0.002 | 2.92E-01 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 2.27E-01 | 1 | 0.009 | 8.72E-03 | 4.47E-03 | |
| Ethylbenzene | 100-41-4 | 4.46E+02 | 0.002 | 8.92E-01 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 3.22E-01 | 1 | 0.70 | 7.00E-01 | 7.85E-01 | |
| Toluene | 108-88-3 | 2.34E+02 | 0.002 | 4.68E-01 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 2.71E-01 | 1 | 5.241 | 5.24E+00 | 3.63E+00 | |
| Total Xylenes | 1330-20-7 | 3.83E+02 | 0.002 | 7.66E-01 | 0.3 | 1.34E-01 | 1.5 | 2.65 | 4.34E-01 | 2.12E-01 | 1 | 10.00 | 1.00E+01 | 9.85E+00 | |

[a] Values taken from May 2013 RSL Chemical-specific Parameters Supporting Table

[b] Default values taken from Equation 4-10 of "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites" (EPA, 2002)

[c] For organics: $K_d$=$K_{oc}$ x $f_{oc}$; For inorganics: $K_d$ values taken from Appendix C assuming a pH of 6.8 (EPA, 2002)

[d]DAF assumed to be 1, which models no dilution or attenuation of contaminants, in order to provide a more conservative estimate of the leaching criteria

## Table 1-10: Toxicity Factors

| Constituents | CAS No. | Non-Carcinogenic | | Carcinogenic | |
|---|---|---|---|---|---|
| | | Inhalation Reference Concentration (RfCi*1) | Inhalation Reference Dose (RfDi*2) | Inhalation Unit Risk (IUR*1) | Inhalation Cancer Slope Factor (Sfi *2) |
| Tetrachloroethene | 127-18-4 | 4.00E-02 | 1.14E-02 | 2.60E-07 | 9.10E-04 |
| Trichloroethene | 79-01-6 | 2.00E-03 | 5.71E-04 | 4.10E-06 | 1.44E-02 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 0 | 0 | 0 | 0.00E+00 |
| Vinyl chloride | 75-01-4 | 1.00E-01 | 2.86E-02 | 4.40E-06 | 1.54E-02 |
| | | | | | |
| Benzene | 71-43-2 | 3.00E-02 | 8.57E-03 | 7.80E-06 | 2.73E-02 |
| Ethylbenzene | 100-41-4 | 1.00E+00 | 2.86E-01 | 2.50E-06 | 8.75E-03 |
| Toluene | 108-88-3 | 5.00E+00 | 1.43E+00 | 0 | 0.00E+00 |
| Total Xylenes | 1330-20-7 | 1.00E-01 | 2.86E-02 | 0 | 0.00E+00 |

**Notes:**

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991).

*1 May 2013 Regional Screening Level (RSL) Summary Table data from EPA.

*2 Calculated using "Conversion Equations for Inhalation Reference Concentrations and Inhalation Unit

## Table 1-11: Final Type 4 Risk Reduction Standards for Groundwater

| Constituents | CAS No. | Final Type 4 Groundwater RRS (µg/L) |
|---|---|---|
| Tetrachloroethene | 127-18-4 | 98 |
| Trichloroethene | 79-01-6 | 5 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 204 |
| Vinyl chloride | 75-01-4 | 3 |
| | | |
| Benzene | 71-43-2 | 9 |
| Ethylbenzene | 100-41-4 | 700 |
| Toluene | 108-88-3 | 5,241 |
| Total Xylenes | 133-02-07 | 10,000 |

Note: Final RRS values were excerpted from Table 1-12

## Table 1-12: Type 4 Risk Reduction Standards for Groundwater [Rule 391-3-19-.07(9)(c)]

| Constituents (mg/L) | CAS No. | RAGS (Equation 2 from Table 1-13) Non-Carcinogenic Adult | RAGS (Equation 1 from Table 1-14) Carcinogenic Adult | Lesser of values from Equations 1 and 2 | Table 1, App III or Background, or Detection Limit (from GA EPD 391-3-19) | Type 4 RRS (lesser of values from Equations 1 and 2) |
|---|---|---|---|---|---|---|
| Tetrachloroethene | 127-18-4 | 9.81E-02 | 2.56E-01 | 9.81E-02 | 5.00E-03 | 9.81E-02 |
| Trichloroethene | 79-01-6 | 5.24E-03 | 1.51E-02 | 5.24E-03 | 5.00E-03 | 5.24E-03 |
| 1,2-Dichloroethene (cis) | 156-59-2 | 2.04E-01 | NC | 2.04E-01 | 7.00E-02 | 2.04E-01 |
| Vinyl chloride | 75-01-4 | 1.50E-01 | 3.27E-03 | 3.27E-03 | 2.00E-03 | 3.27E-03 |
| | | | | | | |
| Benzene | 71-43-2 | 7.21E-02 | 8.72E-03 | 8.72E-03 | 5.00E-03 | 8.72E-03 |
| Ethylbenzene | 100-41-4 | 2.27E+00 | 2.91E-02 | 2.91E-02 | 7.00E-01 | 7.00E-01 |
| Toluene | 108-88-3 | 5.24E+00 | NC | 5.24E+00 | 1.00E+00 | 5.24E+00 |
| Total Xylenes | 133-02-07 | 2.88E-01 | NC | 2.88E-01 | 1.00E+01 | 1.00E+01 |

**Notes:**

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be assigned a zero value (RAGS Vol 1., EPA, 1991). A value of "NC" was assigned when the parameters were not defined, due to the inability to divide a numerator by zero.

## Table 1-13: Type 4 Non-Carcinogenic Evaluation for Groundwater; Non-Residential Adult (RAGS Equation 2)

| Constituents | CAS No. | Target Hazard Index (THI) | Body Weight (BW) | Averaging Time (AT) | Conversion Factor (CF) | Exposure Frequency (EF) | Exposure Duration (ED) | Ingestion Rate of Water (Irw) | Oral Reference Dose (RfDo) | Inhalation Rate of Air (Ira) | Andelman Volatilization Factor (K) | Inhaltion Reference Dose (RfDi) (from Table 1-10) | RAGS (Equation 2) Non-Carcinogenic Adult | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Unit | (kg) | (yr) | (d/yr) | (d/yr) | (yr) | (L/d) | (mg/kg-d) | ($m^3$/d) | (L/$m^3$) | (mg/kg-d) | (mg/L) | |
| Tetrachloroethene | 127-18-4 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 6.00E-03 | 20 | 0.50 | 1.14E-02 | 9.81E-02 | |
| Trichloroethene | 79-01-6 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 5.00E-04 | 20 | 0.50 | 5.71E-04 | 5.24E-03 | *See notes below |
| 1,2-Dichloroethene (cis) | 156-59-2 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 2.00E-03 | 20 | 0.50 | 0.00E+00 | 2.04E-01 | |
| Vinyl chloride | 75-01-4 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 3.00E-03 | 20 | 0.50 | 2.86E-02 | 1.50E-01 | |
| | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 4.00E-03 | 20 | 0.50 | 8.57E-03 | 7.21E-02 | |
| Ethylbenzene | 100-41-4 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 1.00E-01 | 20 | 0.50 | 2.86E-01 | 2.27E+00 | |
| Toluene | 108-88-3 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 8.00E-02 | 20 | 0.50 | 1.43E+00 | 5.24E+00 | |
| Total Xylenes | 133-02-07 | 1 | 70 | 25 | 365 | 250 | 25 | 1 | 2.00E-01 | 20 | 0.50 | 2.86E-02 | 2.88E-01 | |

**Notes:**

Pursuant to Rule 391-3-19-.07(7)(b)1, groundwater RRS are calculated to evaluate the potential for noncancer toxic effects via ingestion of, or inhalation of volatiles from, groundwater. The water-air concentration relationship is applicable only to constituents with a Henry's Law constant of greater than 1 x 10 atm-m /mole and a molecular weight of less than 200 g/mole (RAGS Part B, EPA, 1991).

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of 'N/A' was given when both parameters were not defined, due to the inability to divide an equation by zero.

kg = kilogram; yr = year; d/yr = days per year; L/d = liters per day; kg/mg = kilograms per milligram; mg/kg-d = milligram per kilogram day; m3/d =cubic meters per day;
L/m3 = liters per cubic meter; mg/L = milligrams per liter

## Table 1-14: Type 4 Carcinogenic Evaluation for Groundwater; Non-Residential Adult (RAGS Equation 1)

| Constituents | CAS No. | Target Excess Risk (TR) | Body Weight (BW) | Averaging Time (AT) | Conversion Factor (CF) | Exposure Frequency (EF) | Exposure Duration (ED) | Ingestion Rate of Water (Irw) | Oral Cancer Slope Factor (Sfo) | Ingestion Rate of Air (Ira) | Andelman Volatilization Factor (K) | Inhalation Cancer Slope Factor (Sfi) (from Table 1-10) | RAGS (Equation 1) Carcinogenic Adult | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (kg) | (yr) | (d/yr) | (d/yr) | (yr) | (L/d) | $(mg/kg\text{-}d)^{-1}$ | $(m^3/d)$ | $(L/m^3)$ | $(mg/kg\text{-}d)^{-1}$ | (mg/L) | |
| Tetrachloroethene | 127-18-4 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 2.10E-03 | 20 | 0.5 | 9.10E-04 | 2.56E-01 | |
| Trichloroethene | 79-01-6 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 4.60E-02 | 20 | 0.5 | 1.44E-02 | 1.51E-02 | |
| 1,2-Dichloroethene (cis) | 156-59-2 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 0 | 20 | 0.5 | 0.00E+00 | NC | *See Notes below |
| Vinyl chloride | 75-01-4 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 7.20E-01 | 20 | 0.5 | 1.54E-02 | 3.27E-03 | |
| | | | | | | | | | | | | | | |
| Benzene | 71-43-2 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 5.50E-02 | 20 | 0.5 | 2.73E-02 | 8.72E-03 | |
| Ethylbenzene | 100-41-4 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 1.10E-02 | 20 | 0.5 | 8.75E-03 | 2.91E-02 | |
| Toluene | 108-88-3 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 0 | 20 | 0.5 | 0.00E+00 | NC | *See Notes below |
| Total Xylenes | 133-02-07 | 1.00E-05 | 70 | 70 | 365 | 250 | 25 | 1 | 0 | 20 | 0.5 | 0.00E+00 | NC | *See Notes below |

**Notes:**

Pursuant to Rule 391-3-19-.07(7)(b)1, groundwater RRS are calculated to evaluate the potential for noncancer toxic effects via ingestion of, or inhalation of volatiles from, groundwater. The water-air concentration relationship is applicable only to constituents with a Henry's Law constant of greater than 1 x 10 atm-m /mole and a molecular weight of less than 200 g/mole (RAGS Part B, EPA, 1991).
*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of 'N/A' was given when both parameters were not defined, due to the inability to divide an equation by zero.

kg = kilogram; yr = year; d/yr = days per year; L/d = liters per day; kg/mg = kilograms per milligram; mg/kg-d = milligram per kilogram day; m3/d =cubic meters per day;
L/m3 = liters per cubic meter; mg/L = milligrams per liter

# Table 2-1: Potential Release Sources

| Areas of Concern (AOC) | Description | Constituents of Concern (COC) | Potential Release Sources | Reference ID | Correspondance Date |
|---|---|---|---|---|---|
| 1 | Suspected Area of Disposal #1 | Black Liquor | Buried waste black liquor drums | 2 | 8/10/1992 |
| 2 | Suspected Area of Disposal #2 | Black Liquor | Buried waste black liquor drums | 2 | 8/10/1992 |
| 3 | Suspected Area of Disposal #3 | Black Liquor | Buried waste black liquor drums | 2 | 8/10/1992 |
| 4 | Tire Shop Area (former Wash Rack) | Halogenated Organic compounds, Volatile Organic Aromatic compounds, Diesel | Release of PCE/TCE combined with Detrex Vapor Generator at Tire Shop (former Wash Rack); Spill around a portable lighting system, southwest of Tire Shop; Discharge of an unknown liquid from holding tank, formerly located at the Tire Shop | 2, 34, 56 | 8/10/1992, 12/20/2001, 6/3/2008 |
| 5 | Current Wash Rack Area | Chlorinated Volatile Organic compounds | PCE/TCE release from AOC 4; Break in underground piping for the groundwater extraction system, east and west of Current Wash Rack | 97 | 5/4/2011 |
| 6 | City of Port Wentworth Stormwater Ditch (west of McKenzie property) | Diesel, Metals, Halogenated Organic compounds, Volatile Organic Aromatic compounds, Polynuclear Aromatic Hydrocarbon compounds | Diesel and Black Liquor spill from unknown source; PCE/TCE release from AOC 4 | 2 | 8/10/1992 |
| 7 | McKenzie Stormwater Culvert (west from RW-3) | Chlorinated Volatile Organic compounds, Volatile Organic Aromatic compounds, Metals | PCE/TCE release from AOC 4 | 2 | 8/10/1992 |
| 8 | McKenzie Underground Pipe (east of RW-2) | Chlorinated Volatile Organic compounds | PCE/TCE release from AOC 4 | 2 | 8/10/1992 |
| 9 | Percolation Pond | Chlorinated Volatile Organic compounds | Effluent from groundwater treatment system | 112 | 8/2/2012 |
| 10 | Former Holding Pond | Chlorinated Volatile Organic compounds, Metals | Effluent from groundwater treatment system | 80E | 11/9/2009 |

References:

2 - GB Robbins, 1992
34 - Geovac, 2001
56 - Geovac, 2008
80E - CH2MHILL, 2009
97 - Geovac, 2011b
112 - GADNR, 2012

# Table 2-2: Site Excavations

## Soil Excavations

| Areas of Concern (AOC) | Location of Excavation | Quantity Removed During Excavation | Remarks | Reference ID | Correspondance Date |
|---|---|---|---|---|---|
| 2 | Suspected Area of Disposal #2 | Undefined | Investigated for presence of waste black liquor drums and excavated using shovels and backhoe. | 2 | 8/10/1992 |
| 3 | Suspected Area of Disposal #3 | Undefined | Investigated for presence of waste black liquor drums and excavated using shovels and backhoe. | 2 | 8/10/1992 |
| 4A | Southwest of Tire Shop | Excavated approximately 1,000 cubic yards of soil. | Soils excavated on the southwestern side of the Tire Shop during a soil venting pilot study. | 7 | 4/6/1994 |
| 4A | Southwest of Tire Shop | Excavated 855 tons of soil. | Excavated soils disposed of at off-site facility. | 9 | 4/26/1998 |
| 4B | Southeast of Tire Shop | Excavated approximately 1,100 cubic yards of soil. | | 9 | 4/26/1998 |
| 5A | Eastern side of the current wash rack | 5 to 10 cubic yards | Excavated on November 29, 2010 (?). | 92A | 1/12/2011 |
| 5B | Western side of the current wash rack | 5 to 10 cubic yards | Excavated on December 7, 2010. | 92A | 1/12/2011 |

## Sediment Excavations

| Areas of Concern (AOC) | Location of Excavation | Quantity Removed During Excavation | Remarks | Reference ID | Correspondance Date |
|---|---|---|---|---|---|
| 6 | City of Port Wentworth Stormwater Ditch (west of McKenzie property) | Approximately 60 cubic yards (ref: #5) of contaminated soils excavated. | Emergency reponse from April 15 - 20, 1992. Sediments excavated from City of Port Wentworth stormwater ditch after a temporary dam was constructed. | 3 (and # 5 where applicable) | 5/13/1993 (and 12/8/1993 where applicable) |

References:

2 - GB Robbins, 1992
3 - GB Robbins, 1993
5 - Farley Jones, 1993
7 - Farley Jones, 1994
9 - Handex, 1998
92A - Geovac, 2011

# Table 2-3: Post-Excavation Sampling Location

## Soil Sampling

| Area of Concern (AOC) | Sampling Location | Reference ID | Correspondance Date |
|---|---|---|---|
| 2 | Suspected Area of Disposal #2 | 2 | 8/10/1992 |
| 3 | Suspected Area of Disposal #3 | 2 | 8/10/1992 |
| 4A | Southwest of Tire Shop | 3 | 5/13/1993 |
| 4A | Southwest of Tire Shop | 7 | 4/6/1994 |
| 4A | Southwest of Tire Shop | 56 | 6/3/2008 |
| 4B | Southeast of Tire Shop | 7 | 4/6/1994 |
| 4C | Within the Tire Shop | 25 | 4/10/2001 |
| 4C | Within the Tire Shop | 36A | 2/28/2002 |
| 4C | Within the Tire Shop | 56 | 6/3/2008 |
| 5A | Eastern side of the current wash rack | 92A | 1/12/2011 |
| 5B | Western side of the current wash rack | 92A | 1/12/2011 |

## Sediment Sampling

| Area of Concern (AOC) | Sampling Location | Reference ID | Correspondance Date |
|---|---|---|---|
| 6 | City of Port Wentworth Stormwater Ditch (west of McKenzie property) | 3 | 5/13/1993 |
| 6 | City of Port Wentworth Stormwater Ditch (west of McKenzie property) | 3 | 5/13/1993 |
| 6 | City of Port Wentworth Stormwater Ditch (west of McKenzie property) | 47 | 8/30/2005 |
| 6 | City of Port Wentworth Stormwater Ditch (west of McKenzie property) | 107A | 2/22/2012 |

References:
2 - GB Robbins, 1992
3 - GB Robbins, 1993
7 - Farley Jones, 1994
25 - Geovac, 2001a
107A - Geovac, 2012

# Table 2-4: Post-Excavation Sample Results

| SL No. | Sample ID (Sample Depth) | Type | Source Reference | Ethylbenzene | Toluene | MTBE | Total Xylene | 1-Methyl naphthalene | 2-Methyl naphthalene | Naphthalene | Chlorobenzene | Chloromethane | PCE | TCE | cis-1,2-Dichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | Delineation Standards | | | 20 | 14.4 | | 20 | | | 2 | 10 | | 0.18 | 0.13 | 0.53 |
| 1 | 1 (S) | sediment | 2 | <5 | <5 | <5 | 0.175 | 6.96 | 5.06 | 13.1 | <5 | <5 | <5 | <5 | N/A |
| 2 | 1 (3') | sediment | 2 | <5 | <5 | <5 | <5 | 1.097 | 0.864 | 2.92 | <5 | <5 | <5 | <5 | N/A |
| 3 | 2 (S) | sediment | 2 | <50 | <50 | <50 | 2.682 | 26.2 | 12.4 | 45.47 | <50 | <50 | 3.10 | 1.05 | N/A |
| 4 | 3 (S) | sediment | 2 | <5 | <5 | <5 | 0.771 | 1.06 | 1.86 | 1.263 | 0.06 | <5 | <5 | <5 | N/A |
| 5 | 3 (3') | sediment | 2 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A |
| 6 | 4 (S) | sediment | 2 | 5.653 | 17.317 | <50 | 15.287 | 2.8 | 13.8 | 11.16 | <50 | 1.23 | 20.86 | 19.47 | N/A |
| 7 | 4 (3') | sediment | 2 | 16.74 | 409.778 | 0.45 | 5.5 | <5 | 0.459 | <5 | <5 | <5 | 6.67 | <5 | N/A |
| 8 | 5 (S) | sediment | 2 | <5 | <5 | <5 | <5 | 5.845 | 15.7 | 7.14 | <5 | <5 | <5 | <5 | N/A |
| 9 | 5 (3') | sediment | 2 | 0.65 | 1.35 | 0.28 | 1.88 | <5 | <5 | <5 | <5 | 0.96 | <5 | <5 | N/A |
| 10 | 6 (S) | sediment | 2 | 11.204 | 45.607 | 1.777 | 30.454 | 10.2 | 21.3 | 18.89 | <50 | 0.64 | 42.74 | 25.67 | N/A |
| 11 | 6 (3') | sediment | 2 | 0.055 | 3.251 | <5 | 1.958 | 3.03 | 4.49 | 5.02 | 0.03 | <5 | <5 | 2.00 | N/A |
| 12 | 7 (S) | sediment | 2 | 0.018 | 0.78 | 0.26 | 3.07 | 0.433 | 3.23 | 1.3 | <5 | 0.19 | 2.445 | <5 | N/A |
| 13 | 7 (3') | sediment | 2 | 0.187 | 0.818 | 0.051 | 0.519 | 0.552 | 0.459 | 0.505 | 0.035 | <5 | <5 | 1.63 | N/A |
| 14 | 8 (S) | sediment | 2 | <5 | <5 | <5 | 0.355 | 0.732 | 1.13 | 0.964 | <5 | <5 | 2.57 | 0.41 | N/A |
| 15 | 9 (S) | sediment | 2 | <5 | <5 | <5 | 0.03 | <5 | <5 | <5 | <5 | <5 | 0.74 | <5 | N/A |
| 16 | 9 (3') | sediment | 2 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A |
| 17 | 10 (S) | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 18 | 10 (3') | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 19 | 11 (S) | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 20 | 11 (3') | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 21 | 12 (S) | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 22 | 12 (3') | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 23 | 13 (S) | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 24 | 13 (3') | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 25 | 14 (S) | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 26 | 14 (3') | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 27 | 15 (S) | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 28 | 15 (3') | sediment | 3 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A |
| 29 | MB-1 (1'-1.5') | soil | 7 | <0.05 | <0.05 | N/A | <0.05 | N/A | N/A | N/A | N/A | N/A | <0.05 | <0.05 | <0.05 |
| 30 | MB-2 (1'-1.5') | soil | 7 | <0.05 | <0.05 | N/A | <0.05 | N/A | N/A | N/A | N/A | N/A | 11 | <0.05 | <0.05 |
| 31 | MB-3 (1'-1.5') | soil | 7 | <0.05 | <0.05 | N/A | <0.05 | N/A | N/A | N/A | N/A | N/A | <0.05 | <0.05 | <0.05 |
| 32 | MB-4 (1'-1.5') | soil | 7 | <0.05 | <0.05 | N/A | <0.05 | N/A | N/A | N/A | N/A | N/A | <0.05 | <0.05 | <0.05 |
| 33 | MB-5 (1'-1.5') | sediment | 7 | <0.05 | <0.05 | N/A | <0.05 | N/A | N/A | N/A | N/A | N/A | <0.05 | <0.05 | <0.05 |
| 34 | MB-6 (1'-1.5') | sediment | 7 | <0.05 | <0.05 | N/A | <0.05 | N/A | N/A | N/A | N/A | N/A | <0.05 | <0.05 | <0.05 |
| 35 | SB-1 (2'-4') | soil | 9 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 |
| 36 | SB-2 (2'-4') | soil | 9 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 |
| 37 | SB-3 (2'-4') | soil | 9 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 |
| 38 | SB-4 (2'-4') | soil | 9 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 |
| 39 | D (0.5') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | 1520 | 16.9 | 4.88 |
| 40 | SS-4 (0.5') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | 0.014 | <5 | <5 |
| 41 | E (2') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | 960 | 3.56 | 3 |
| 42 | N (4') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | 10.7 | 0.0966 | 5.99 |
| 43 | SS-1 (0.5') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | 0.0738 | 0.0057 | 0.0649 |
| 44 | K (9') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | 0.146 | 0.0091 | 0.147 |
| 45 | SS-2 (0.5') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | <5 | <5 | 0.781 |
| 46 | SS-3 (2') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.0088 | N/A | 387 | 7.26 | 1.32 |
| 47 | TM-2 (2') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | <5 | <5 | <5 |
| 48 | TM-4 (4') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | <5 | <5 | 52 |
| 49 | TM-6 (6') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | <5 | <5 | 0.14 |
| 50 | TM-8 (8') | soil | 36A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | <5 | N/A | <5 | <5 | 0.42 |
| 51 | E (1') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | 0.015 | 0.001 | 0.01 |
| 52 | E (2') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | 0.046 | 0.0044 | 0.058 |
| 53 | D (1') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | <0.0015 | <0.0009 | <0.0015 |
| 54 | D (2') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | 0.0045 | 0.0018 | 0.22 |
| 55 | I (1') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | <0.0015 | <0.0009 | <0.0015 |
| 56 | I (2') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | <0.0015 | <0.0009 | 0.0068 |
| 57 | N (1') | soil | 56 | N/A | N/A | N/A | <0.237 | N/A | N/A | <0.11 | N/A | N/A | 1.5 | 0.17 | 0.59 |
| 58 | N (2') | soil | 56 | N/A | N/A | N/A | <0.2 | N/A | N/A | <0.098 | N/A | N/A | 1.8 | 0.35 | 9.3 |
| 59 | Stripper Tower | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | 0.0013 | N/A | N/A | 0.054 | 0.0055 | 0.011 |
| 60 | RW-4 (1') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | <0.0015 | <0.0009 | <0.0015 |
| 61 | RW-2 (6') | soil | 56 | 0.0012 | 0.0016 | N/A | 0.0047 | N/A | N/A | <0.0014 | N/A | N/A | 0.0022 | <0.0009 | 0.0026 |
| 62 | RW-3 (4') | soil | 56 | <0.0008 | <0.0017 | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | 0.0067 | 0.0054 | 0.055 |
| 63 | 4N (3') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | <0.0015 | <0.0009 | <0.0015 |
| 64 | 4W (1') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | 0.0024 | <0.0009 | 0.0057 |
| 65 | 4S (3') | soil | 56 | N/A | N/A | N/A | <0.0028 | N/A | N/A | <0.0014 | N/A | N/A | 0.0022 | 0.0007 | <0.0015 |
| 66 | Soil East (0.5') | soil | 92B | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.023 | 0.0044 | 0.065 |
| 67 | Soil West (0.5') | soil | 92B | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.0019 | <0.0009 | 0.0003 J |
| 68 | Excavation | soil | 92B | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.7 | 0.7 | 0.73 |
| 69 | Sed-1 (S) | sediment | 47 | <0.001 | <0.001 | N/A | <0.002 | N/A | N/A | <0.001 | N/A | N/A | 0.004 | <0.001 | <0.001 |
| 70 | Sed-2 (S) | sediment | 47 | <0.002 | <0.002 | N/A | <0.003 | N/A | N/A | <0.002 | N/A | N/A | <0.002 | <0.002 | <0.002 |
| 71 | Sed-3 (S) | sediment | 47 | <0.001 | <0.001 | N/A | <0.002 | N/A | N/A | <0.001 | N/A | N/A | 0.012 | <0.001 | <0.001 |
| 72 | Sed-4 (S) | sediment | 47 | <0.001 | <0.001 | N/A | <0.002 | N/A | N/A | <0.001 | N/A | N/A | 0.006 | <0.001 | <0.001 |
| 73 | Sed-5 (S) | sediment | 47 | <0.003 | <0.003 | N/A | <0.004 | N/A | N/A | <0.003 | N/A | N/A | <0.003 | <0.003 | 0.027 |
| 74 | Sed-6 (S) | sediment | 47 | <0.17 | 0.87 | N/A | <0.330 | N/A | N/A | <0.17 | N/A | N/A | <0.17 | <0.17 | 0.57 |
| 75 | Sed-7 (S) | sediment | 47 | <0.001 | <0.001 | N/A | <0.002 | N/A | N/A | <0.001 | N/A | N/A | <0.001 | <0.001 | 0.001 |
| 76 | Sed-8 (S) | sediment | 47 | <0.002 | <0.002 | N/A | <0.003 | N/A | N/A | <0.002 | N/A | N/A | <0.002 | <0.002 | <0.002 |
| 77 | Sed-9 (S) | sediment | 47 | <0.001 | <0.001 | N/A | <0.002 | N/A | N/A | <0.001 | N/A | N/A | <0.001 | <0.001 | <0.001 |
| 78 | SR-25 | sediment | 107 | <0.0008 | <0.0008 | <0.0008 | <0.0009 | N/A | N/A | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 |
| 79 | GRP STA | sediment | 107 | <0.0008 | <0.0008 | <0.0008 | <0.0009 | N/A | N/A | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 |
| 80 | GR 111 | sediment | 107 | <0.0008 | <0.0008 | <0.0008 | <0.0009 | N/A | N/A | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 |
| 81 | GR CUL | sediment | 107 | <0.0008 | <0.0008 | <0.0008 | <0.0009 | N/A | N/A | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 |
| 82 | D EOT | sediment | 107 | <0.0008 | <0.0008 | <0.0008 | <0.0009 | N/A | N/A | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 |
| 83 | D TB | sediment | 107 | <0.0008 | <0.0008 | <0.0008 | <0.0009 | N/A | N/A | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 |

| SL No. | Sample ID (Sample Depth) | trans-1,2-Dichloroethene | 1,1-Dichloroethene | 1,1-Dichloroethane | 1,2-Dichloroethane | Vinyl Chloride | Methylene Chloride | t-1,2-Dichloropropane | 1,1,1-Trichloroethane | 1,1,2-Trichloroethane | 1,1,2,2-Tetrachloroethane | Trichlorofluoromethane | Trihalomethanes (total) | Cadmium | Lead | Arsenic | Chromium | Copper | Aluminum | Sodium | Potassium | Titanium | Sulfate | Silicon | TRPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | Delineation Standards | 10 | 0.7 | 400 | 0.5 | 0.04 | 0.5 | 0.5 | 20 | 0.5 | 0.02 | 200 | 8 | 2 | 75 | 20 | 100 | 100 | | | | | | | |
| 1 | 1 (S) | N/A | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | 1 (3') | N/A | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | 2 (S) | N/A | 2.934 | <50 | <50 | <50 | 0.318 | <50 | <50 | <50 | <50 | <50 | <50 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | 3 (S) | N/A | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 5 | 3 (3') | N/A | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 6 | 4 (S) | N/A | 2.985 | 0.28 | <50 | <50 | 0.318 | 0.796 | 0.68 | <50 | <50 | <50 | <50 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 7 | 4 (3') | N/A | <5 | <5 | <5 | <5 | <5 | <5 | 2.44 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 8 | 5 (S) | N/A | 0.41 | <5 | <5 | <5 | <5 | <5 | 2.79 | 0.075 | 0.16 | 0.205 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 9 | 5 (3') | N/A | 0.32 | <5 | <5 | <5 | <5 | 0.41 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 | 6 (S) | N/A | 3.55 | 0.94 | <5 | <5 | <5 | 2.024 | 5.43 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11 | 6 (3') | N/A | 0.29 | 0.03 | <50 | <50 | <50 | <50 | 0.22 | <50 | <50 | <50 | <50 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 12 | 7 (S) | N/A | 0.46 | 0.19 | <5 | <5 | <5 | 0.3 | 3.03 | 0.09 | <5 | <5 | 0.12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 13 | 7 (3') | N/A | <5 | <5 | <5 | <5 | <5 | <5 | 0.43 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 14 | 8 (S) | N/A | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 15 | 9 (S) | N/A | <5 | <5 | 0.035 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 | 9 (3') | N/A | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 17 | 10 (S) | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18 | 10 (3') | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 19 | 11 (S) | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 20 | 11 (3') | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 21 | 12 (S) | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 22 | 12 (3') | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 23 | 13 (S) | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 24 | 13 (3') | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 25 | 14 (S) | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 26 | 14 (3') | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 27 | 15 (S) | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 28 | 15 (3') | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 29 | MB-1 (1'-1.5') | <0.05 | <0.05 | N/A | N/A | <0.05 | 0.013 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 30 | MB-2 (1'-1.5') | <0.05 | <0.05 | N/A | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 31 | MB-3 (1'-1.5') | <0.05 | <0.05 | N/A | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 32 | MB-4 (1'-1.5') | <0.05 | <0.05 | N/A | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 33 | MB-5 (1'-1.5') | <0.05 | <0.05 | N/A | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 34 | MB-6 (1'-1.5') | <0.05 | <0.05 | N/A | N/A | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 35 | SB-1 (2'-4') | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | N/A | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | 3 | 8.1 | 2.5 | 15.6 | 3.7 | 778 | 491 | 849 | 50.8 | 1730 | 109000 | <2.7 |
| 36 | SB-2 (2'-4') | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | N/A | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <1 | 13.3 | 1.5 | 16.9 | 5.2 | 1000 | 444 | 799 | 32 | 2280 | 104000 | <2.7 |
| 37 | SB-3 (2'-4') | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | N/A | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <1 | 23.2 | 2.8 | 19.6 | 6.7 | 1040 | 116 | 831 | 42.5 | 2810 | 6190 | 12.7 |
| 38 | SB-4 (2'-4') | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | N/A | <0.125 | <0.125 | <0.125 | <0.125 | <0.125 | <1 | 7 | <1 | 3.6 | 1.4 | 5 | 1.4 | 127 | 3.2 | 5.9 | 86200 | <2.7 |
| 39 | D (0.5') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 40 | SS-4 (0.5') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 41 | E (2') | <100 | <100 | <100 | N/A | <100 | <100 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 42 | N (4') | 0.146 | 0.0276 | 0.768 | N/A | 1.49 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 43 | SS-1 (0.5') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 44 | K (9') | <5 | <5 | <5 | N/A | 0.0064 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 45 | SS-2 (0.5') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 46 | SS-3 (2') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 47 | TM-2 (2') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 48 | TM-4 (4') | <5 | <5 | <5 | N/A | <5 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 49 | TM-6 (6') | 0.018 | <5 | <5 | N/A | 0.11 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 50 | TM-8 (8') | 0.0089 | <5 | <5 | N/A | 0.23 | <5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 51 | E (1') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 52 | E (2') | 0.0026 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 53 | D (1') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 54 | D (2') | 0.008 | N/A | N/A | N/A | 0.0097 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 55 | I (1') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 56 | I (2') | <0.0015 | N/A | N/A | N/A | 0.0011 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 57 | N (1') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 58 | N (2') | 0.11 | N/A | N/A | N/A | <0.0012 | 0.18 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 59 | Stripper Tower | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 60 | RW-4 (1') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 61 | RW-2 (6') | <0.0015 | N/A | 0.004 | N/A | 0.0062 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 62 | RW-3 (4') | 0.003 | N/A | 0.0046 | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 63 | 4N (3') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 64 | 4W (1') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 65 | 4S (3') | <0.0015 | N/A | N/A | N/A | <0.0012 | <0.0041 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 66 | Soil East (0.5') | 0.0004 J | <0.0003 | N/A | N/A | <0.0012 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 67 | Soil West (0.5') | <0.0015 | <0.0003 | N/A | N/A | <0.0012 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 68 | Excavation | 0.003 | 0.0009 J | N/A | N/A | 0.0005 J | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 69 | Sed-1 (S) | N/A | N/A | N/A | N/A | <0.001 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 9.1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 70 | Sed-2 (S) | N/A | N/A | N/A | N/A | <0.002 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5.4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 71 | Sed-3 (S) | N/A | N/A | N/A | N/A | <0.001 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 72 | Sed-4 (S) | N/A | N/A | N/A | N/A | <0.001 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.9 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 73 | Sed-5 (S) | N/A | N/A | N/A | N/A | <0.003 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.8 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 74 | Sed-6 (S) | N/A | N/A | N/A | N/A | 0.43 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5.6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 75 | Sed-7 (S) | N/A | N/A | N/A | N/A | <0.001 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.99 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 76 | Sed-8 (S) | N/A | N/A | N/A | N/A | <0.002 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5.2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 77 | Sed-9 (S) | N/A | N/A | N/A | N/A | <0.001 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.8 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 78 | SR-25 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.022 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 79 | GRP STA | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.022 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 80 | GR 111 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.022 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 81 | GR CUL | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.022 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 82 | D EOT | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.022 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 83 | D TB | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.022 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

NOTES:

Values in bold are above detection limits

2.7 Indicates values above delineation standards

S = Sample taken from surface soils or sediment

J = Target analyte was positively identified below the quantitation limit and above the detection limit

References:

2 - GB Robbins, 1992
3 - GB Robbins, 1993
7 - Farley Jones, 1994
9 - Handex, 1998
36A - Geovac, 2002
47 - Geovac, 2005
56 - Geovac, 2008
92B - Geovac, 2011a
107 - Geovac, 2012

# Table 2-5: Summary of Historical Groundwater Analytical Results

| MW-2S | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-93 | 2,390 | 460 | BDL | 8,830 | BDL | 41 | BDL | BDL | BDL | | | | | | | | 11720.7 |
| Mar-94 | BDL | BDL | BDL | 1,200.00 | 11,000.00 | BDL | BDL | BDL | BDL | | | | | | | | 12200 |
| Mar-96 | 20.00 | 270.00 | BDL | 78.00 | 130.00 | BDL | BDL | BDL | BDL | | | | | | | | 498 |
| Sep-96 | 11,000 | 400 | BDL | 280 | 33 | 9 | BDL | BDL | BDL | | | | | | | | 11722 |
| Oct-96 | 31.00 | 5,450.00 | BDL | 676.00 | 58.00 | ND | BDL | BDL | BDL | | | | | | | | 6215 |
| Apr-97 | 47.00 | 180.00 | BDL | 2,200.00 | BDL | BDL | BDL | BDL | BDL | | | | | | | | 2427 |
| Jul-97 | 111 | 338 | BDL | 380 | BDL | BDL | BDL | BDL | BDL | | | | | | | | 829 |
| Feb-98 | 81.90 | 238.00 | 8,920.00 | 2,530.00 | BDL | 56.10 | BDL | BDL | BDL | | | | | | | | 11826 |
| Jul-98 | BDL | 86.00 | BDL | 1,800.00 | BDL | BDL | BDL | BDL | BDL | | | | | | | | 1886 |
| Feb-99 | 0.50 | 1.30 | 64.20 | 30.90 | BDL | BDL | BDL | BDL | BDL | | | | | | | | 96.9 |
| Oct-99 | 0.42 | 1.50 | 60.50 | 37.10 | 0.37 | 0.23 | 3.00 | <0.26 | <0.16 | | | | | | | | 103.12 |
| May-00 | BDL | 1.50 | 22.80 | 9.80 | <1 | <1 | <1 | <1 | <1 | | | | | | | | 34.1 |
| Jan-01 | 4.80 | 2.90 | 31.20 | 12.40 | <1 | <1 | <1 | <1 | <1 | | | | | | | | 51.3 |
| Jan-02 | <1 | <1 | 37.00 | 34.00 | <1 | <1 | <1 | <1 | <1 | | | | | | | | 71 |
| Jun-12 | 0.21 u | 1.80 | 0.96 J | 0.33 u | 0.30 u | 0.21 | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 6.49 |
| Mar-13 | 1.20 | 2.00 | 2.40 | 0.33 u | 0.30 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | 0.21 u | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 9.33 |
| Aug-13 | <0.16 | <0.19 | 16.00 | <0.19 | <0.21 | <0.20 | <0.11 | <0.26 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| MW-2D | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-94 | 49,000.0 | 680.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 49680 |
| Feb-96 | 10,000.0 | 1,600.0 | <0.21 | 31.0 | 7.40 | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 11638.4 |
| Mar-96 | 120.0 | 260.0 | <0.21 | 1,000.0 | 89.0 | 21.0 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 1490 |
| Sep-96 | 6.0 | 11.0 | <0.21 | 1,300.0 | 25.0 | 9.00 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 1351 |
| Oct-96 | 15,880.0 | 5,805.0 | <0.21 | 676.0 | 78.0 | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 22439 |
| Apr-97 | 13,000.0 | BDL | BDL | 140.0 | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 13140 |
| Jul-97 | 10,000.0 | 8,700.0 | <0.21 | 5,400.0 | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 24100 |
| Feb-98 | 7,750.0 | 3,560.0 | 3,450.0 | 120.0 | 25.0 | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 14905 |
| Jul-98 | 24,000.0 | 13,000.0 | <0.21 | 620.0 | 140.0 | 130.0 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 37890 |
| Nov-98 | 26,200.0 | 7,950.0 | 11,200.0 | 561.0 | 95.80 | 106.0 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 46112.8 |
| Feb-99 | 18,300.0 | 5,220.0 | 7,680.0 | 187.0 | 18.80 | 9.10 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 31414.9 |
| Oct-99 | 51,800.0 | 15,000.0 | 14,000.0 | 900.0 | 94.0 | 100.0 | 200.0 | BDL | 130.0 | | NA | NA | NA | NA | NA | NA | 82224 |
| May-00 | 24,046.0 | 7,158.0 | 9,470.0 | 386.0 | 56.30 | 56.0 | 135.00 | <1 | 89.30 | | NA | NA | NA | NA | NA | NA | 41396.6 |
| Jan-01 | 6,240.0 | 2,290.0 | 2,280.0 | 102.0 | 23.70 | 12.50 | 11.80 | <1 | 88.50 | | NA | NA | NA | NA | NA | NA | 11048.5 |
| Aug-01 | 9,300.0 | 4,300.0 | 5,400.0 | 250.0 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 19250 |
| Aug-01 | 2,800.0 | 2,500.0 | 5,200.0 | 360.0 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 10860 |
| Jun-05 | *combined with RW-1 to improve recovery* | | | | | | | | | | | | | | | | |
| Jun-09 | 110.0 | 97.0 | 360.0 | 38.0 | 1.20 | 0.80 | <1 | <1 | <1 | | | | | | | | 607 |
| Mar-11 | 120.0 | 260.0 | 1,800.0 | 130.0 | 15.0 u | 30.0 | 15.0 u | 16.0 u | 21.0 J | | 14.0 u | 13.0 u | 15.0 u | 25.0 u | 12.0 u | 15.0 u | 2501 |
| Jun-12 | 55.0 | 160.0 | 650.0 | 70.0 | 5.30 | 18.0 | 10.0 | 3.0 u | 32.0 | | 1.50 u | 1.90 u | 1.50 u | 2.0 u | 1.50 u | 1.50 u | 1013.2 |
| Mar-13 | 1.40 | 12.0 | 61.0 | 32.0 | 0.44 J | 3.80 | 11.0 | 0.15 u | 0.10 u | 0.21 u | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | 123.09 |
| Aug-13 | 300.0 D | 490.0 D | 890.0 D | 92.0 | 7.0 | 16.0 | 11.0 | <0.26 | 48.0 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

# Table 2-5: Summary of Historical Groundwater Analytical Results

| MW-4S | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-93 | 1,910.0 | 125.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 2035 |
| Mar-94 | 2,900.0 | 680.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 3580 |
| Feb-96 | 460.0 | 500.0 | BDL | BDL | 5.9 | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 965.9 |
| Feb-98 | 267.0 | 336.0 | 838.0 | 2.4 | 13.5 | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 1456.9 |
| Jul-98 | 200.0 | 680.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 880 |
| Nov-98 | 1,580.0 | 1,630.0 | 912.0 | 1.8 | 4.7 | 2.70 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 4131.2 |
| Feb-99 | 80.0 | 79.0 | 96.10 | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 255.1 |
| Oct-99 | 1,490.0 | 1,590.0 | 850.00 | 4.0 | 8.8 | 8.80 | 8.80 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 3960.4 |
| May-00 | 1,343.0 | 1,807.0 | 956.00 | 7.6 | 6.6 | 12.80 | 15.00 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 4148 |
| Jan-01 | 3,730.0 | 5,940.0 | 7,580.0 | 28.7 | 185.0 | 13.10 | 10.00 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 17486.8 |
| Nov-01 | 250.0 | 430.0 | 360.00 | 23.0 | 40.0 | 7.70 | 5.90 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 1116.6 |
| Sep-02 | <25 | 500.0 | 660.00 | <25 | <25 | <25 | <25 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 1160 |
| Oct-03 | 9.7 | 680.0 | 4,100.0 | 40.0 | 34.0 | 6.40 | 6.40 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 4876.5 |
| Nov-04 | 6,300.0 | 750.0 | 4,800.0 | 73.0 | <50 | <50 | <50 | BDL | BDL | | NA | NA | NA | NA | NA | NA | 11923 |
| May-05 | 100.0 u | 50.0 u | 5,700.0 | 74.0 | 50.0 J | 50.0 u | 50.0 u | 50.0 u | 50.0 u | | NA | NA | NA | NA | NA | NA | 6174 |
| Oct-06 | 146.0 | 528.0 | 2,410.0 | 20.0 u | 31.0 J | 10.0 u | 10.0 u | 10.0 u | 10.0 u | | NA | NA | NA | NA | NA | NA | 3175 |
| Jul-10 | 0.2 u | 48.0 | 930.0 | 28.0 | 10.0 | 2.10 u | 3.0 u | 3.10 u | 2.0 u | | NA | NA | NA | NA | NA | NA | 1026.41 |
| Dec-10 | BDL | 48.0 | 930.0 | 28.0 | 10.0 | | | | | | NA | NA | NA | NA | NA | NA | 1016 |
| Jun-12 | 0.3 u | 0.8 J | 4.60 | 0.1 u | 0.3 u | 0.21 u | 0.15 u | 0.30 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.50 u | 0.15 u | 7.14 |
| Mar-13 | 12.0 u | 130.0 | 3,100.0 | 44.0 | 28.0 | 8.00 u | 10.00 u | 7.50 u | 5.0 u | | 7.50 u | 9.50 u | 7.50 u | 10.0 u | 7.50 u | 7.50 u | 3382 |
| Aug-13 | <0.16 | 2,200.0 D | 6,500.0 D | 74.0 | 46.0 | 22.00 | 6.30 | <0.26 | <0.16 | | <0.16 | <0.19 | 0.66 J | <0.20 | <0.18 | | |

| MW-11D | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Jul-98 | 40.0 | 16.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 56 |
| Nov-98 | 2,010.0 | 766.0 | 976.0 | 2.6 | 5.4 | 4.60 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 3764.6 |
| Feb-99 | 752.0 | 24.6 | 42.9 | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 819.5 |
| Oct-99 | 142.0 | 76.0 | 95.0 | 1.2 | 0.6 | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | NA | 314.8 |
| May-00 | 676.0 | 389.0 | 422.0 | 7.9 | 4.6 | 2.10 | 4.70 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 1506.3 |
| Jan-01 | 14.7 | 4.0 | 3.5 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 22.2 |
| Jan-02 | 19.0 | 7.5 | 3.9 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 30.4 |
| Jun-05 | <2 | 2.0 | 10.0 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 12 |
| Mar-11 | 0.2 u | 1.9 | 18.0 | 3.1 | 0.3 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.25 u | 0.24 u | 0.30 u | 24.53 |
| Aug-12 | 0.3 u | 0.4 u | 0.7 J | 0.5 J | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | 2.74 |
| Mar-13 | 1.7 | 0.6 J | 0.3 J | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | 0.23 I | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | 3.64 |
| Aug-13 | <0.16 | 0.7 J | 1.7 | <0.19 | <0.21 | <0.20 | <0.11 | <0.26 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| MW-14D | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Jan-01 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | |
| Dec-01 | 10.0 | 2.90 | 1.60 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 14.5 |
| Jan-02 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | |
| Sep-02 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | | NA | NA | NA | NA | NA | |
| Jun-05 | <2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | |
| Mar-11 | 0.21 u | 0.24 u | 0.22 u | 0.33 u | 0.33 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | |
| Jun-12 | 0.25 u | 0.17 u | 0.33 u | 0.18 u | 0.34 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | |
| Mar-13 | 0.25 u | 0.48 J | 1.60 | 0.18 u | 0.34 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | 0.21 u | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | |
| Aug-13 | <0.16 | 0.79 J | 2.60 | <0.19 | <0.21 | <0.20 | <0.11 | <0.26 | <0.17 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| MW-15S | Tetrachloroethene | Trichloroethene | C1,2- Dichloroethen | Vinyl Chloride | T-1,2- Dichloroethen | 1,1- Dichloroethen | 1,1- Dichloroethane | Chloroethane | 111- Trichlroethane | 1,4- Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Jan-02 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | |
| Apr-07 | <0.3 | 3.20 | 4.50 | <0.4 | BDL | BDL | BDL | BDL | <0.3 | | NA | NA | NA | NA | NA | NA | 7.7 |
| Nov-07 | *Not Located* | | | | | | | | | | | | | | | | |
| Mar-11 | *Not Located* | | | | | | | | | | | | | | | | |
| Jun-12 | *Not Located* | | | | | | | | | | | | | | | | |
| Mar-13 | *Not Located* | | | | | | | | | | | | | | | | |

| MW-15D | Tetrachloroethene | Trichloroethene | C1,2- Dichloroethen | Vinyl Chloride | T-1,2- Dichloroethen | 1,1- Dichloroethen | 1,1- Dichloroethane | Chloroethane | 111- Trichlroethane | 1,4- Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Jan-01 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | <1 |
| Jan-02 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | <1 |
| Apr-07 | 0.70 I | 3.50 | 4.80 | <0.4 | BDL | BDL | BDL | <0.3 | <0.3 | | NA | NA | NA | NA | NA | NA | 8.3 |
| Nov-07 | *(well modified by inserting 5 foot casing extension)* | | | | | | | | | | | | | | | | |
| Jun-09 | 1.50 | 2.10 | 3.20 | 0.48 u | 0.47 u | 0.50 u | 0.45 u | 0.66 u | 0.40 u | | 0.35 u | 0.43 u | 0.43 u | 0.85 u | 0.26 u | 0.23 u | |
| Mar-11 | 0.21 u | 0.24 u | 0.22 u | 0.33 u | 0.30 u | BDL u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 3.98 |
| Jun-12 | *Not Located* | | | | | | | | | | | | | | | | |
| Mar-13 | *Not Located* | | | | | | | | | | | | | | | | |

| PAW-3 | Tetrachloroethene | Trichloroethene | C1,2- Dichloroethen | Vinyl Chloride | T-1,2- Dichloroethen | 1,1- Dichloroethen | 1,1- Dichloroethane | Chloroethane | 111- Trichlroethane | 1,4- Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Oct-97 | BDL | BDL | 3,990.00 | 678.0 | BDL | BDL | | | | | NA | NA | NA | NA | NA | NA | 4668 |
| Feb-99 | 1.4 | 121.00 | 1,250.00 | 467.0 | 4.7 | 8.20 | | | | | NA | NA | NA | NA | NA | NA | 1852.3 |
| May-00 | 9.4 | 8.30 | 131.00 | 122.0 | BDL | 2.60 | 7.10 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 280.4 |
| Jan-01 | 2.5 | 5.30 | 79.70 | 144.0 | <1 | 1.80 | 7.50 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 240.8 |
| Jan-02 | <1 | 3.80 | 61.00 | 66.0 | <1 | 2.30 | 6.80 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 139.9 |
| Sep-02 | 13.0 | 6.10 | 17.00 | 13.0 | <1 | 3.10 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 52.2 |
| Oct-03 | <0.43 | <0.43 | 9.80 | 28.0 | <0.43 | <0.43 | <0.43 | <0.43 | <0.43 | | NA | NA | NA | NA | NA | NA | 37.8 |
| Nov-04 | 3.1 | <1 | 4.40 | 9.2 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 16.7 |
| Jul-05 | <1 | <1 | 4.00 | 10.0 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 14 |
| Apr-07 | <0.3 | 2.10 | 4.30 | 3.8 | BDL | BDL | 2.10 | <0.3 | <0.3 | | NA | NA | NA | NA | NA | NA | 12.3 |
| Nov-07 | *well located* | | | | | | | | | | | | | | | | |
| Jul-10 | 34.0 | 30.00 | 200.00 | 33.0 | 1.8 J | 1.00 u | 0.50 u | 1.60 u | 1.00 u | | NA | NA | NA | NA | NA | NA | 302.9 |
| Dec-10 | 0.3 u | 0.30 u | 2.50 | 33.0 | 1.8 J | 0.20 u | 0.20 u | 0.31 u | 0.40 u | | NA | NA | NA | NA | NA | NA | 39.01 |
| Aug-12 | 150.0 | 30.00 | 12.00 | 1.4 J | 1.7 u | 1.00 u | 1.50 u | 0.75 u | 0.50 u | | 0.75 u | 0.95 u | 0.75 u | 1.00 u | 0.75 u | 0.75 u | 203.8 |
| Mar-13 | 9.0 | 6.60 | 14.00 | 3.7 | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | 0.21 u | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | 35.45 |
| Aug-13 | 17.0 | 9.00 | 86.00 | 25.0 | 0.7 J | 0.91 J | <0.11 | <0.26 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| PAW-4 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Oct-97 | 11,900.0 | BDL | 3,330.00 | BDL | BDL | BDL | BDL | BDL | BDL | | NA | NA | NA | NA | NA | | 15230 |
| Feb-99 | 5,650.0 | 1,370.00 | 2,350.00 | 623.0 | 28.5 | 5.50 | BDL | BDL | BDL | | NA | NA | NA | NA | NA | | 10027 |
| May-00 | 3,554.0 | 826.00 | 1,390.00 | 130.0 | 35.8 | 5.70 | 6.50 | <1 | <1 | | NA | NA | NA | NA | NA | | 5948 |
| Jan-01 | 3,270.0 | 803.00 | 1,500.00 | 240.0 | 30.7 | 5.10 | 3.20 | 1.40 | <1 | | NA | NA | NA | NA | NA | | 5853.4 |
| Jan-02 | 2,900.0 | 726.00 | 1,800.00 | 160.0 | 33.0 | 6.10 | 4.00 | 1.50 | <1 | | NA | NA | NA | NA | NA | | 5630.6 |
| Sep-02 | 920.0 | 300.00 | 740.00 | 33.0 | <25 | <25 | <25 | <25 | <25 | | NA | NA | NA | NA | NA | | 1993 |
| Oct-03 | 1,300.0 | 340.00 | 820.00 | 53.0 | 17.0 | 2.50 | 1.10 | <1 | <1 | | NA | NA | NA | NA | NA | | 2533.6 |
| Nov-04 | 1,400.0 | 450.00 | 1,800.00 | 130.0 | <250 | <50 | <50 | <50 | <50 | | NA | NA | NA | NA | NA | | 3780 |
| Jul-05 | 1,500.0 | 640.00 | 1,900.00 | 120.0 | <50 | <50 | <50 | <50 | <50 | | NA | NA | NA | NA | NA | | 4160 |
| Apr-07 | 654.0 | 230.00 | 1,050.00 | 138.0 | 14.6 | 2.9 I | <1 | <1.5 | <1.5 | | NA | NA | NA | NA | NA | | 2086.6 |
| Nov-07 | | | | | | | | *well located* | | | | | | | | | |
| Jul-10 | 0.2 u | 0.24 u | 2.50 | 1.8 | 0.3 u | 0.21 u | 0.30 u | 0.31 i | 0.20 u | | NA | NA | NA | NA | NA | NA | 6.07 |
| Dec-10 | 34.0 | 30.00 | 200.00 | 33.0 | 1.8 J | 20.00 u | 20.00 u | 31.00 u | 40.00 u | | NA | NA | NA | NA | NA | NA | 409.8 |
| Aug-12 | 0.3 u | 0.19 J | 0.29 J | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | |
| Mar-13 | 0.3 u | 0.17 u | 0.23 u | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | 0.21 u | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | |
| Aug-13 | <0.16 | <0.19 | 1.00 J | <0.19 | <0.21 | <0.20 | <0.11 | <0.26 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| RW-1 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Jan-04 | 2,300.0 | 2,000.00 | 2,300.00 | 150.0 | <50 | <50 | <50 | <50 | <50 | | NA | NA | NA | NA | NA | NA | 6750 |
| Nov-04 | 2,200.0 | 200.00 | 2,800.00 | 300.0 | <50 | <50 | <50 | <50 | 50.00 | | NA | NA | NA | NA | NA | NA | 5550 |
| Jul-05 | 2,100.0 | 1,400.00 | 1,700.00 | 180.0 | <20 | <20 | 21.00 | <20 | 28.00 | | NA | NA | NA | NA | NA | NA | 5429 |
| Oct-06 | 459.0 | 465.00 | 804.00 | 121.0 | <4 | 19.80 I | 8.20 I | <6 | 40.60 | | NA | NA | NA | NA | NA | NA | 1917.6 |
| Nov-07 | 1,900.0 | <10 | 1,100.00 | 130.0 | 12.0 | 50.00 I | 9.30 | | 39.00 | | NA | NA | NA | NA | NA | NA | 3240.3 |
| Jun-09 | 650.0 | 140.00 | 200.00 | 52.0 | 1.4 | 1.60 | 0.45 u | 0.66 u | 0.40 u | | 0.35 u | 0.43 u | 0.43 u | 0.85 u | 0.26 u | 0.23 u | 1046.51 |
| Mar-11 | 590.0 | 320.00 | 850.00 | 47.0 | 5.5 J | 5.60 J | 4.60 J | 3.10 u | 2.00 u | | 2.70 u | 2.60 u | 3.00 u | 5.00 u | 2.40 u | 3.00 u | 1827.8 |
| Nov-11 | 590.0 | 320.00 | 850.00 | 47.0 | 5.5 J | 5.60 J | 4.60 J | 3.10 u | 2.00 u | | 2.70 u | 2.60 u | 3.00 u | 5.00 u | 2.40 u | 3.00 u | 1827.8 |
| Aug-12 | 5.5 | 13.00 | 37.00 | 4.7 | 0.5 J | 0.24 J | 0.46 J | 0.30 u | 0.10 u | | 0.36 J | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | 61.81 |
| Mar-13 | 4.6 | 12.00 | 30.00 | 9.8 | 0.4 J | 0.21 u | 0.74 J | 0.30 u | 0.10 u | 0.21 u | 0.58 J | 0.19 u] | 0.15 u | 0.20 u | 0.15 u | 0.15 u | 59.75 |
| Aug-13 | <0.16 | 0.57 J | 6.90 | 3.8 | <0.21 | <0.20 | <0.11 | <0.25 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| RW-2 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Sep-02 | 350.0 | 380.00 | 630.00 | <1 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 1360 |
| Jan-04 | 2,000.0 | 1,300.00 | 1,500.00 | 68.0 | <50 | <50 | <50 | <50 | <50 | | NA | NA | NA | NA | NA | NA | 4868 |
| Nov-04 | 17,000.0 | 4,900.00 | 7,000.00 | 290.0 | <100 | <100 | <100 | <100 | <100 | | NA | NA | NA | NA | NA | NA | 29190 |
| Jul-05 | 11,000.0 | 4,300.00 | 7,600.00 | 620.0 | <100 | <100 | <100 | <100 | <100 | | NA | NA | NA | NA | NA | NA | 23520 |
| Oct-06 | 779.0 | 559.00 | 1,990.00 | <40 | <20 | <20 | <20 | <30 | <30 | | NA | NA | NA | NA | NA | NA | 3328 |
| Mar-11 | 28.0 | 230.00 | 3,500.00 | 430.0 | 17.0 J | 12.00 J | 15.00 u | 16.00 u | 10.00 u | | 14.00 u | 13.00 u | 15.00 u | 25.00 u | 12.00 u | 15.00 u | 4352 |
| Nov-11 | 490.0 | 130.00 | 170.00 | 38.0 | 3.0 u | 2.10 u | 3.00 u | 3.10 u | 2.00 u | | 2.70 u | 2.60 u | 3.00 u | 5.00 u | 2.40 u | 3.00 u | 859.9 |
| Aug-12 | 1,900.0 | 5,500.00 | 6,700.00 | 210.0 | 42.0 J | 28.00 J | 8.50 J | 7.50 u | 5.00 u | | 7.50 u | 9.50 u | 7.50 u | 10.00 u | 7.50 u | 7.50 u | 14450.5 |
| Mar-13 | 2,200.0 | 1,700.00 | 7,400.00 | 340.0 | 30.0 JD | 25.00 JD | 7.50 u | 15.00 u | 5.00 u | 10.00 u | 7.50 u | 9.50 u | 7.50 u | 10.00 u | 7.50 u | 7.50 u | 11782 |
| Aug-13 | 350.0 D | 680.00 D | 4,800.00 D | 370.0 D | 28.0 | 13.00 | 2.10 | <0.25 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

# Table 2-5: Summary of Historical Groundwater Analytical Results

| RW-3 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Sep-02 | <25 | 180.00 | 1,500.00 | 52.0 | <1 | <1 | <1 | <1 | <1 | | NA | NA | NA | NA | NA | NA | 1732 |
| Jan-04 | <150 | 430.00 | 4,200.00 | 350.0 | <50 | <50 | <50 | <50 | <50 | | NA | NA | NA | NA | NA | NA | 4980 |
| Jul-05 | 90.0 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | | NA | NA | NA | NA | NA | NA | 90 |
| Oct-06 | 54.0 | 414.00 | 3,110.00 | 139.0 | 19.6 I | <4 | <4 | <6 | <6 | | NA | NA | NA | NA | NA | NA | 3717 |
| Nov-07 | 14,000.0 | 4,200.00 | 6,300.00 | 190.0 | 65.0 | 16.00 | 6.10 | | 1.80 | | NA | NA | NA | NA | NA | NA | 24778.9 |
| Jun-09 | 190.0 | 770.00 | 4,100.00 | 100.0 | 21.0 | 6.30 | 0.45 u | 0.66 u | 0.40 u | | 0.35 u | 0.43 u | 0.43 u | 0.85 u | 0.26 u | 0.23 u | 5191.36 |
| Dec-10 | 6,200.0 | 4,600.00 | 8,500.00 | 190.0 | 46.0 | 64.00 | 20.00 u | 31.00 u | 20.00 u | | NA | NA | NA | NA | NA | NA | 19671 |
| Nov-11 | 50.0 | 330.00 | 2,700.00 | 68.0 | 15.0 u | 10.00 u | 15.00 u | 15.00 u | 10.00 u | | 10.00 u | 13.00 u | 15.00 u | 25.00 u | 12.00 u | 15.00 u | 3303 |
| Aug-12 | 56.0 | 280.00 | 1,200.00 | 34.0 | 4.9 J | 3.80 J | 2.10 J | 1.50 u | 1.00 u | | 1.50 u | 1.90 u | 1.50 u | 2.00 u | 1.50 u | 1.50 u | 1593.2 |
| Mar-13 | 54.0 | 300.00 | 1,700.00 | 76.0 | 17.0 u | 10.00 u | 7.50 u | 15.00 u | 5.00 u | 10.00 u | 7.50 u | 9.50 u | 7.50 u | 10.00 u | 7.50 u | 7.50 u | 2244 |
| Aug-13 | 36.0 | 430.00 D | 3,500.00 D | 160.0 | 20.0 | 6.20 | 2.70 | <0.25 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| RW-4 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Dec-05 | 1,500.0 | 1,800.00 | 2,000.00 | 82.0 | 22.0 | 22.00 | <10 | <10 | <10 | | NA | NA | NA | NA | NA | NA | 5426 |
| Oct-06 | 459.0 | 3,500.00 | 4,220.00 | 196.0 | 21.4 | 62.50 | 9.70 I | <3 | <3 | | NA | NA | NA | NA | NA | NA | 8458.9 |
| Nov-07 | 1,500.0 | 2,300.00 | 2,100.00 | 150.0 | 31.0 | 51.00 | 9.20 | | 13.00 | | NA | NA | NA | NA | NA | NA | 6154.2 |
| Jun-09 | 460.0 | 590.00 | 2,200.00 | 170.0 | 20.0 | 47.00 | 12.00 | 0.66 u | 0.40 u | | 0.35 u | 0.43 u | 0.43 u | 0.85 u | 0.26 u | 0.23 u | 3502.61 |
| Mar-11 | 810.0 | 910.00 | 2,900.00 | 280.0 | 20.0 | 73.00 | 15.00 u | 16.00 u | 30.00 | | 14.00 u | 13.00 u | 15.00 u | 25.00 u | 12.00 u | 15.00 u | 5148 |
| Nov-11 | 1,400.0 | 960.00 | 2,900.00 | 110.0 | 25.0 J | 45.00 J | 20.00 J | 16.00 u | 30.00 | | 14.00 u | 13.00 u | 15.00 u | 25.00 u | 12.00 u | 15.00 u | 5600 |
| Aug-12 | 1,500.0 | 1,700.00 | 3,100.00 | 96.0 | 29.0 J | 84.00 | 55.00 | 7.50 u | 140.00 | | 7.50 u | 9.50 u | 7.50 u | 10.00 u | 7.50 u | 7.50 u | 6761 |
| Mar-13 | 1,200.0 | 1,200.00 | 2,600.00 | 250.0 | 28.0 JD | 24.00 JD | 40.00 JD | 15.00 u | 140.00 | 10.00 u | 7.50 u | 9.50 u | 7.50 u | 10.00 u | 7.50 u | 7.50 u | 5556.5 |
| Aug-13 | 950.0 D | 760.00 D | 1,200.00 D | 42.0 | 9.2 | 17.00 | 8.70 | <0.25 | 91.00 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.26 | | |

| RW-5 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Dec-05 | 400.0 | 160.00 | 120.00 | <5 | <5 | <5 | <5 | <5 | <5 | | NA | NA | NA | NA | NA | NA | 680 |
| Oct-06 | 1,450.0 | 540.00 | 2,090.00 | 69.8 | 15.0 | 5.00 | 3.0 I | <1.5 | <1.5 | | NA | NA | NA | NA | NA | NA | 4169.8 |
| Nov-07 | *together with RW-2* | | | | | | | | | | | | | | | | |
| Jun-09 | 3,100.0 | 3,800.00 | 9,300.00 | 89.0 | 59.0 | 10.00 | 5.70 | 0.66 u | 0.40 u | | 0.35 u | 0.43 u | 0.43 u | 0.85 u | 0.26 u | 0.23 u | 16367.31 |
| Mar-11 | 5,100.0 | 1,600.00 | 7,600.00 | 970.0 | 38.0 J | 27.00 J | 15.00 u | 16.00 u | 10.00 u | | 14.00 u | 13.00 u | 15.00 u | 25.00 u | 12.00 u | 15.00 u | 15470 |
| Nov-11 | 7,000.0 | 2,600.00 | 20,000.00 | 1,600.0 | 150.0 | 21.00 u | 30.00 u | 31.00 u | 20.00 u | | 27.00 u | 26.00 u | 30.00 u | 50.00 u | 24.00 u | 30.00 u | 31639 |
| Aug-12 | 2,300.0 | 3,900.00 | 5,800.00 | 170.0 | 40.0 J | 20.00 J | 10.00 J | 7.50 u | 5.00 u | | 7.50 u | 9.50 u | 7.50 u | 10.00 u | 7.50 u | 7.50 u | 12302 |
| Mar-13 | 820.0 | 1,400.00 | 4,100.00 | 200.0 | 24.0 JD | 29.00 JD | 7.50 u | 15.00 u | 5.00 u | 10.00 u | 7.50 u | 9.50 u | 7.50 u | 20.00 JD | 7.50 u | 7.50 u | 6670 |
| Aug-13 | 4,500.0 D | 1,200.00 D | 9,200.00 D | 650.0 | 44.0 | <0.20 | 2.60 | 1.80 | <0.16 | <0.17 | <0.16 | <0.19 | 1.80 | 1.70 | <0.18 | | |

| RW-6 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Jun-08 | 0.9 I | 6.90 | 11.00 | <0.52 | 1.2 | <0.36 | <0.45 | <0.36 | <0.34 | | <0.23 | <0.34 | 40.00 | <0.38 | 2.00 | <0.35 | 61.1 |
| Jun-09 | 40.0 | 33.00 | 37.00 | 0.7 J | 0.9 J | 0.50 u | 0.45 u | 0.66 u | 0.40 u | | 0.35 u | 0.43 u | 0.43 u | 0.85 u | 0.26 u | 0.23 u | 116.19 |
| | *The well was compromised in November 2007.* | | | | | | | | | | | | | | | | |
| Mar-11 | 1.0 u | 1.20 u | 2.80 J | 1.6 u | 1.5 u | 1.00 u | 1.50 u | 1.60 u | 1.00 u | | 1.40 u | 1.30 u | 1.50 u | 2.50 u | 1.20 u | 1.50 u | |
| Aug-12 | 2.2 | 3.30 | 1.70 | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.29 J | 0.15 u\ | 9.46 |
| Mar-13 | 0.3 u | 1.20 | 1.70 | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | 0.21 u | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.29 J | 0.15 u | 5.62 |
| Aug-13 | 4.6 | 0.96 J | 3.30 | <0.19 | <0.21 | <0.20 | <0.11 | <0.25 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

# Table 2-5: Summary of Historical Groundwater Analytical Results

| RW-7 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Dec-05 | 4,500.0 | 1,300.00 | 8,100.00 | 130.0 | 87.0 | <50 | <50 | <100 | <50 | | NA | NA | NA | NA | NA | NA | 14117 |
| Oct-06 | 9,680.0 | 5,440.00 | 16,500.00 | 262.0 | 127.0 | 31.50 | <10 | <15 | <15 | | NA | NA | NA | NA | NA | NA | 32040.5 |
| Nov-07 | *together with RW-3* | | | | | | | | | | | | | | | | |
| Dec-10 | 15,000.0 | 7,800.00 | 8,700.00 | 160.0 | 55.0 | 20.00 u | 30.00 u | 31.00 u | 20.00 u | | NA | NA | NA | NA | NA | NA | 31816 |
| Nov-11 | 7,700.0 | 3,500.00 | 6,700.00 | 130.0 | 36.0 J | 21.00 u | 30.00 u | 31.00 u | 20.00 u | | 27.00 u | 26.00 u | 85.00 J | 50.00 u | 24.00 u | 30.00 u | 18410 |
| Aug-12 | 2,500.0 | 1,800.00 | 4,400.00 | 100.0 | 39.0 J | 28.00 J | 15.00 u | 15.00 u | 10.00 u | | 15.00 u | 19.00 u | 15.00 u | 20.00 u | 15.00 u | 15.00 u | 9006 |
| Mar-13 | 2,500.0 | 2,300.00 | 7,400.00 | 240.0 | 50.0 | 30.00 JD | 7.50 u | 15.00 u | 5.00 u | 10.00 u | 7.50 u | 9.50 u | 16.00 JD | 10.00 u | 7.50 u | 7.50 u | 12615.5 |
| Aug-13 | 11,000.0 D | 5,700.00 D | 11,000.00 D | 490.0 D | 57.0 | 36.00 | 7.00 | <0.25 | <0.16 | <0.17 | <0.16 | 1.90 | 15.00 | 6.70 | <0.18 | | |

| MW-25 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-11 | 1.7 | 1.60 | 2.00 | 0.3 u | 0.3 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 2.50 | 9.72 |

| MW-26 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-11 | 0.2 u | 0.24 u | 0.22 u | 0.3 u | 0.3 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 4.19 |
| Nov-11 | 0.2 u | 0.24 u | 0.22 u | 0.3 u | 0.3 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 4.19 |
| Aug-12 | 0.3 u | 0.17 u | 0.33 u | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | |
| Aug-13 | <0.16 | <0.19 | <0.21 | <0.19 | <0.21 | <0.20 | <0.11 | <0.25 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| MW-27 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-11 | 0.2 u | 0.24 u | 0.22 u | 0.3 u | 0.3 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 4.19 |

| MW-28 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-11 | 0.2 u | 5.40 | 37.00 | 4.3 | 0.4 J | 0.24 J | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 2.50 | 52.4 |
| Jun-12 | 0.3 u | 0.17 u | 0.33 u | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.15 u | |

| MW-29 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-11 | 0.2 u | 3.50 | 5.80 | 0.3 u | 0.3 u | 0.21 u | 0.78 J | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 2.50 | 15.71 |
| Nov-11 | 0.2 u | 0.24 u | 0.22 u | 0.3 u | 0.3 u | 0.21 u | 0.78 J | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 4.67 |
| Jun-12 | 0.3 u | 0.17 u | 0.33 u | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.30 u | |
| Mar-13 | 0.3 u | 0.17 u | 0.33 u | 0.2 u | 0.3 u | 0.21 u | 0.15 u | 0.15 u | 0.10 u | 0.21 u | 0.15 u | 0.19 u | 0.15 u | 0.20 u | 0.15 u | 0.30 u | |
| Aug-13 | 3.2 | 1.90 | 1.50 | <0.19 | <0.21 | <0.20 | <0.11 | <0.25 | <0.16 | <0.17 | <0.16 | <0.19 | <0.14 | <0.20 | <0.18 | | |

| MW-30 | Tetrachloroethene | Trichloroethene | C1,2-Dichloroethen | Vinyl Chloride | T-1,2-Dichloroethen | 1,1-Dichloroethen | 1,1-Dichloroethane | Chloroethane | 111-Trichlroethane | 1,4-Dichlorobenzen | Benzene | Ethylbenzene | Toluene | Xylene | MTBE | Naphthalene | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| Mar-11 | 53.0 | 25.00 | 25.00 | 0.3 u | 1.4 | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 107.62 |
| Nov-11 | 46.0 | 7.70 | 5.30 | 0.3 u | 0.3 u | 0.21 u | 0.30 u | 0.31 u | 0.20 u | | 0.27 u | 0.26 \ u | 0.30 u | 0.50 u | 0.24 u | 0.30 u | 62.26 |

| MW-31 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 3.8 | | 3.60 | | 15.00 | | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.25 | J | 0.30 | u | 25.93 |
| Nov-11 | 15.0 | | 4.40 | | 4.40 | | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.25 | J | 0.30 | u | 27.33 |
| Jun-12 | 1.9 | | 1.30 | | 0.90 | J | 0.2 | u | 0.3 | u | 0.21 | u | 0.15 | u | 0.15 | u | 0.10 | u | | | 0.15 | u | 0.19 | u | 0.15 | u | 0.20 | u | 0.15 | u | 0.15 | u | 6.22 |
| Mar-13 | 0.3 | J | 1.40 | | 2.30 | | 0.2 | u | 0.3 | u | 0.21 | u | 0.15 | u | 0.15 | u | 0.10 | u | 0.21 | u | 0.15 | u | 0.19 | u | 0.15 | u | 0.20 | u | 0.15 | u | 0.15 | u | 6.37 |
| Aug-13 | 1.1 | | 3.20 | | 6.90 | | <0.19 | | <0.21 | | <0.20 | | <0.11 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| MW-32 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 37.0 | | 98.00 | | 220.00 | | 2.0 | J | 2.8 | J | 1.00 | u | 1.50 | u | 1.60 | u | 1.00 | u | | | 1.40 | u | 1.30 | u | 1.50 | u | 2.50 | u | 1.20 | u | 1.50 | u | 374.3 |
| Nov-11 | 14.0 | | 44.00 | | 110.00 | | 0.4 | J | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 171.59 |
| Aug-12 | 41.0 | | 140.00 | | 270.00 | | 1.4 | J | 3.2 | J | 2.40 | J | 1.20 | J | 0.75 | u | 0.50 | J | | | 0.75 | u | 0.95 | u | 0.75 | u | 1.00 | u | 0.75 | u | 0.75 | u | 465.4 |
| Mar-13 | 100.0 | | 140.00 | | 540.00 | | 4.0 | J | 4.7 | J | 2.10 | u | 1.50 | u | 3.00 | u | 1.00 | u | 2.10 | u | 1.50 | u | 1.90 | u | 1.50 | u | 2.00 | u | 1.50 | u | 1.50 | u | 808.3 |
| Aug-13 | 160.0 | | 150.00 | | 720.00 | D | 2.9 | | 10.0 | | 1.90 | | 2.20 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| MW-33 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 10.0 | u | 12.00 | u | 5,100.00 | | 190.0 | | 26.0 | J | 36.00 | J | 22.00 | J | 16.00 | u | 10.00 | u | | | 14.00 | u | 13.00 | u | 15.00 | u | 25.00 | u | 12.00 | u | 15.00 | u | 5516 |
| Jun-12 | 2.5 | u | 1.70 | u | 1,300.00 | | 230.0 | | 3.4 | u | 12.00 | | 9.40 | J | 1.50 | u | 1.00 | u | | | 1.50 | u | 1.90 | u | 1.50 | u | 2.00 | u | 1.50 | u | 1.50 | u | 1567.2 |
| Aug-13 | 1.2 | | <0.19 | | 1,100.00 | D | 150.0 | | 3.4 | | 3.80 | | 4.20 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| MW-34 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |

| MW-35 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 1.4 | | 2.10 | | 14.00 | | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 21.02 |
| Nov-11 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |
| Aug-12 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |
| Aug-13 | 1.3 | | <0.19 | | <0.21 | | <0.19 | | <0.21 | | <0.20 | | <0.11 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| MW-36 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 1.0 | u | 130.00 | | 300.00 | | 9.0 | | 2.2 | J | 1.60 | J | 1.50 | u | 1.60 | u | 1.00 | u | | | 1.40 | u | 1.30 | u | 1.50 | u | 2.50 | u | 1.20 | u | 1.50 | u | 457.3 |
| Aug-12 | 0.2 | u | 0.67 | I | 3.90 | | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 8.3 |
| Mar-13 | 0.3 | u | 0.57 | J | 2.60 | | 0.2 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | 0.21 | u | 0.27 | u | 0.45 | J | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 7.19 |
| Aug-13 | 1.5 | | <0.19 | | 2.50 | | <0.19 | | <0.21 | | <0.20 | | <0.11 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| G-17 | Tetrachloroethene | | Trichloroethene | | C1,2-Dichloroethen | | Vinyl Chloride | | T-1,2-Dichloroethen | | 1,1-Dichloroethen | | 1,1-Dichloroethane | | Chloroethane | | 111-Trichlroethane | | 1,4-Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |
| Aug-12 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |
| Aug-13 | 1.9 | | <0.19 | | <0.21 | | <0.19 | | <0.21 | | <0.20 | | <0.11 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | 28.00 | | <0.20 | | <0.18 | | | | |

# Table 2-5: Summary of Historical Groundwater Analytical Results

| G-19 | Tetrachloroethene | | Trichloroethene | | C1,2- Dichloroethen | | Vinyl Chloride | | T-1,2- Dichloroethen | | 1,1- Dichloroethen | | 1,1- Dichloroethane | | Chloroethane | | 111- Trichlroethane | | 1,4- Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |
| Aug-12 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.45 | J | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.38 |
| Mar-13 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | 0.21 | u | 0.27 | u | 0.45 | J | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.59 |
| Aug-13 | 2.3 | | <0.19 | | 0.83 | J | <0.19 | | <0.21 | | <0.20 | | <0.11 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| G-22 | Tetrachloroethene | | Trichloroethene | | C1,2- Dichloroethen | | Vinyl Chloride | | T-1,2- Dichloroethen | | 1,1- Dichloroethen | | 1,1- Dichloroethane | | Chloroethane | | 111- Trichlroethane | | 1,4- Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-11 | 0.2 | u | 0.24 | u | 0.22 | u | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.30 | u | 4.19 |
| Aug-13 | 3.1 | | 0.85 | J | 1.50 | | <0.19 | | <0.21 | | <0.20 | | <0.11 | | <0.25 | | <0.16 | | <0.17 | | <0.16 | | <0.19 | | <0.14 | | <0.20 | | <0.18 | | | | |

| Effluent | Tetrachloroethene | | Trichloroethene | | C1,2- Dichloroethen | | Vinyl Chloride | | T-1,2- Dichloroethen | | 1,1- Dichloroethen | | 1,1- Dichloroethane | | Chloroethane | | 111- Trichlroethane | | 1,4- Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Jun-03 | 2.0 | | <0.43 | | <0.39 | | <0.49 | | <0.5 | | <0.5 | | <0.33 | | <0.47 | | <0.39 | | | | NA | | NA | | NA | | NA | | NA | | NA | | BDL |
| Oct-03 | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | | | NA | | NA | | NA | | NA | | NA | | NA | | BDL |
| Jan-04 | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | | | NA | | NA | | NA | | NA | | NA | | NA | | BDL |
| Feb-03 | 1.4 | | 2.00 | | 8.50 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | | | NA | | NA | | NA | | NA | | NA | | NA | | 10.5 |
| Oct-03 | <0.43 | | <0.43 | | <0.33 | | <0.43 | | <0.33 | | <0.33 | | <0.33 | | <0.33 | | <0.33 | | | | NA | | NA | | NA | | NA | | NA | | NA | | BDL |
| Jan-04 | <3 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | | | NA | | NA | | NA | | NA | | NA | | NA | | BDL |
| Jul-05 | 8.0 | | 5.00 | | 23.00 | | <1 | | <1 | | <1 | | <1 | | <1 | | <1 | | | | NA | | NA | | NA | | NA | | NA | | NA | | 36 |
| Oct-06 | 1.5 | | 2.40 | | 10.10 | | <0.4 | | <0.2 | | <0.2 | | <0.2 | | <0.3 | | <0.3 | | | | NA | | NA | | NA | | NA | | NA | | NA | | 14 |
| Apr-07 | 1.3 | | 2.10 | | 6.00 | | <0.4 | | <0.2 | | <0.2 | | <0.2 | | <0.3 | | <0.3 | | | | NA | | NA | | NA | | NA | | NA | | NA | | 9.4 |
| Nov-07 | 1.5 | | 0.37 | I | 1.40 | | <0.52 | | <0.41 | | <0.36 | | <0.45 | | <0.36 | | <0.34 | | | | NA | | NA | | NA | | NA | | NA | | NA | | 3.27 |
| Feb-10 | 0.2 | u | 0.24 | u | 1.70 | | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | J | 0.24 | u | 11.00 | | 15.92 |
| Jul-10 | 0.2 | u | 0.24 | u | 0.55 | J | 0.3 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | NA | | NA | | NA | | NA | | NA | | NA | | 2.65 |
| Oct-10 | 0.2 | u | 0.24 | u | 0.22 | u | 0.5 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.02 | u | 2.49 |
| Mar-11 | 0.2 | u | 0.24 | u | 0.32 | J | 0.5 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.02 | u | 2.59 |
| Nov-11 | 0.2 | u | 0.24 | u | 1.20 | | 0.5 | u | 0.3 | u | 0.21 | u | 0.30 | u | 0.31 | u | 0.20 | u | | | 0.27 | u | 0.26 | u | 0.30 | u | 0.50 | u | 0.24 | u | 0.02 | u | 3.47 |
| Aug-12 | 0.3 | u | 0.17 | u | 0.33 | u | 0.2 | u | 0.3 | u | 0.21 | u | 0.15 | u | 0.15 | u | 0.10 | u | | | 0.15 | u | 0.19 | u | 0.15 | u | 0.20 | u | 0.15 | u | 0.15 | u | |
| Mar-13 | 1.0 | I | 1.20 | | 2.90 | | 0.2 | u | 0.3 | u | 0.21 | u | 0.15 | u | 0.30 | u | 0.10 | u | 0.21 | u | 0.15 | u | 0.19 | u | 0.15 | u | 0.20 | u | 0.15 | u | 0.15 | u | 7.56 |

| Tower | Tetrachloroethene | | Trichloroethene | | C1,2- Dichloroethen | | Vinyl Chloride | | T-1,2- Dichloroethen | | 1,1- Dichloroethen | | 1,1- Dichloroethane | | Chloroethane | | 111- Trichlroethane | | 1,4- Dichlorobenzen | | Benzene | | Ethylbenzene | | Toluene | | Xylene | | MTBE | | Naphthalene | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L |
| Mar-13 | 2.2 | | 2.70 | | 12.00 | | 0.2 | u | 0.3 | u | 0.21 | u | 0.15 | u | 0.30 | u | 0.10 | u | 0.21 | u | 0.15 | u | 0.19 | u | 0.15 | u | 0.20 | u | 0.15 | u | 0.15 | u | 19.38 |

**Table 3-1: Groundwater Pumping Rates**

| Monitoring Date* | | Days Treated | Groundwater Pumped | | | Notes |
|---|---|---|---|---|---|---|
| Start | End | | gallons* | gallons/day | gallons/min | |
| 4/1/1998 | 6/1/1998 | 61 | 186,423 | 3,056 | 2.12 | |
| 7/1/1998 | 10/1/1998 | 92 | 196,480 | 2,136 | 1.48 | |
| 11/1/1998 | 3/1/1999 | 120 | 172,456 | 1,437 | 1.00 | |
| 4/1/1999 | 10/1/1999 | 183 | 161,308 | 881 | 0.61 | |
| 1/1/2000 | 3/1/2000 | 60 | 168,912 | 2,815 | 1.96 | |
| 4/1/2000 | 3/3/2003 | 1,066 | 1,518,135 | 1,424 | 0.99 | SES estimate based on previous two years |
| 3/27/2003 | 10/16/2003 | 203 | 1,650,720 | 8,132 | 5.65 | |
| 10/16/2003 | 11/17/2004 | 398 | 649,311 | 1,631 | 1.13 | |
| 11/17/2004 | 12/7/2005 | 385 | 1,610,670 | 4,184 | 2.91 | |
| 12/7/2005 | 12/21/2006 | 379 | 1,456,524 | 3,843 | 2.67 | |
| 12/21/2006 | 12/6/2007 | 350 | 1,827,996 | 5,223 | 3.63 | |
| 12/6/2007 | 8/4/2008 | 242 | 573,156 | 2,368 | 1.64 | |
| Average Rates | | | | 3,094 | 2.15 | |

*Note: "*" represents data derived from SES (2012)*

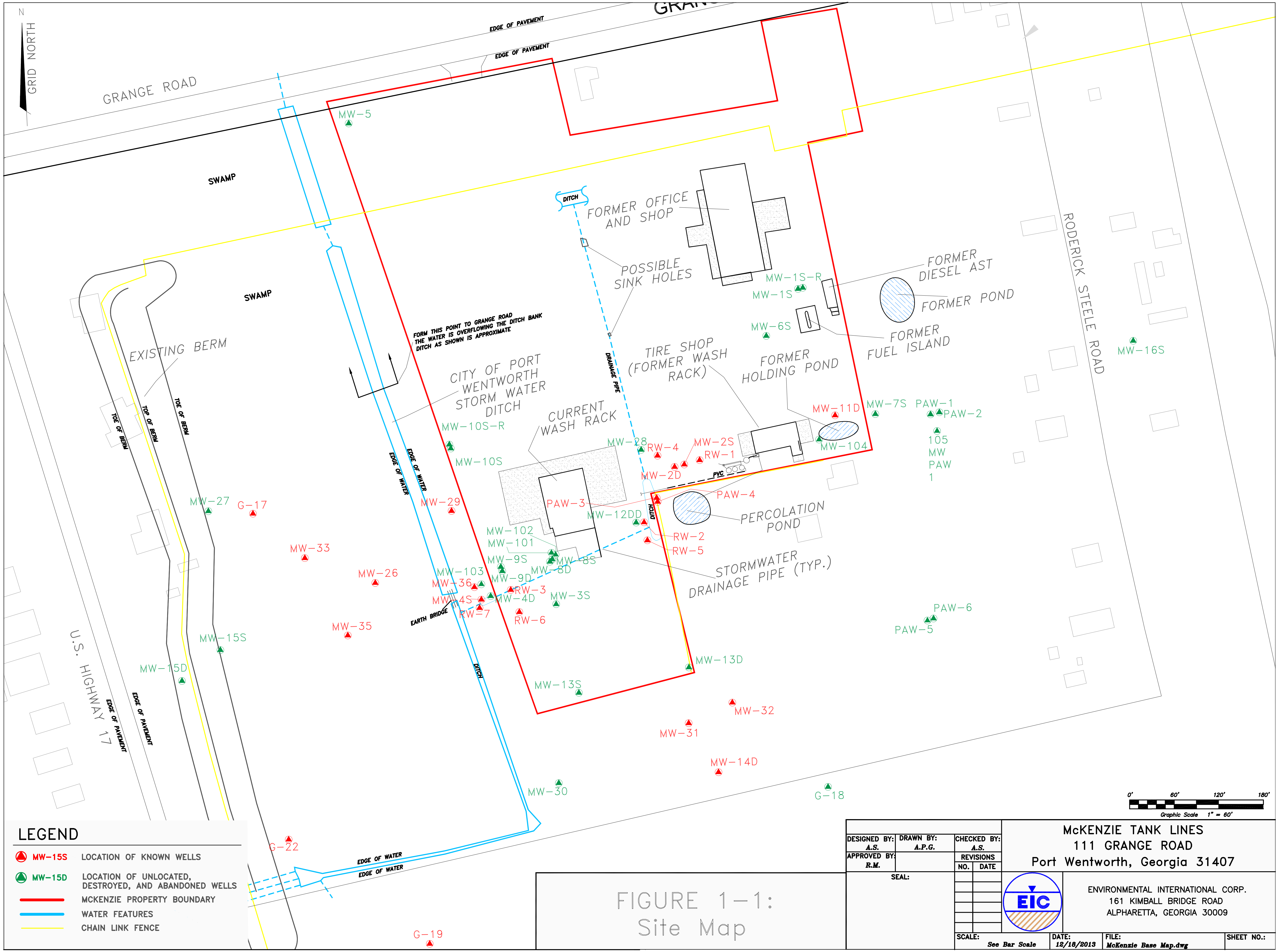
## Table 4-1: Well Inventory

| WELL ID | Status of Well (Source: Joseph Wier, McKenzie) | Well ID Reference | Notes |
|---|---|---|---|
| GP-1 | Unknown | 36A-2 | |
| GP-2 | Unknown | 36A-2 | |
| GP-3 | Unknown | 36A-2 | |
| GP-4 | Unknown | 36A-2 | |
| GP-5 | Unknown | 36A-2 | |
| GP-6 | Unknown | 36A-2 | |
| GP-7 | Unknown | 36A-2 | |
| G-17 | Existing | 113 | |
| G-18 | Destroyed/Abandoned | 113 | |
| G-19 | Existing | 113 | |
| G-22 | Existing | 113 | |
| MW-1S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1 | |
| MW-1S-R | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-2S | Existing | 36A-1; 50; 97B; 113 | |
| MW-2D | Existing | 36A-1; 50; 97B; 113 | |
| MW-2I | Unknown | 50 | Only test boring log available |
| MW-3S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-4S | Existing | 36A-1; 50; 97B; 113 | |
| MW-4D | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-5S | Unknown | 36A-1; 50 | |
| MW-6S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-7S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-8S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-8D | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-9S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-9D | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-10S | Unknown | | |
| MW-10S-R | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-11D | Existing | 36A-1; 50; 97B; 113 | |
| MW-12DD | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-13S | Unknown | 36A-1; 50; 97B | |
| MW-13D | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-14D | Existing | 36A-1; 50; 97B; 113 | |
| MW-15S | Unknown | 36A-1; 50; 97B; 113 | |
| MW-15D | Unknown | 36A-1; 50; 97B; 113 | |
| MW-16S | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 50; 97B | |
| MW-17S | Unknown | 97B | |
| MW-18S | Unknown | 97B | |
| MW-19S | Unknown | 97B | |
| MW-20D | Unknown | 97B | |
| MW-26 | Existing | 113 | |
| MW-27 | Unknown | 113 | |
| MW-28 | Unknown | 113 | |
| MW-29 | Existing | 113 | |
| MW-30 | Unknown | 113 | |
| MW-31 | Existing | 113 | |
| MW-32 | Existing | 113 | |
| MW-33 | Existing | 113 | |
| MW-35 | Existing | 113 | |
| MW-36 | Existing | 113 | |
| PAW-1 | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 97B | |
| PAW-2 | Destroyed/Abandoned | CH2M-Hill Map; 36A-1; 97B | |
| PAW-3 | Existing | 36A-1; 97B; 113 | |
| PAW-4 | Existing | 36A-1; 97B; 113 | |
| PAW-5 | Destroyed/Abandoned | CH2M-Hill Map | |
| PAW-6 | Destroyed/Abandoned | CH2M-Hill Map | |
| RW-1 | Existing | 36A-1; 97B; 113 | |
| RW-2 | Existing | 36A-1; 97B; 113 | |
| RW-3 | Existing | 36A-1; 97B; 113 | |
| RW-4 | Existing | 50; 97B; 113 | |
| RW-5 | Existing | 50; 97B; 113 | |
| RW-6 | Existing | 50; 97B; 113 | |
| RW-7 | Existing | 50; 97B; 113 | |
| RW-8 | Unknown | 97B | |
| RW-9 | Unknown | 97B | |
| RW-10 | Unknown | 97B | |
| RW-11 | Unknown | 97B | |
| RW-12 | Unknown | 97B | |
| RW-13 | Unknown | 97B | |
| 101 MW | Unknown | CH2M-Hill Map | |
| 102 MW | Unknown | CH2M-Hill Map | |
| 103 MW | Unknown | CH2M-Hill Map | |
| 104 MW | Unknown | CH2M-Hill Map | |
| 105 MW | Unknown | CH2M-Hill Map | |

References:
36A-1 - Geovac, 2002; Figure 1-1
36A-2 - Geovac, 2002; Figure 5.2-1
50 - SES, Geovac, 2006; Table 4
97B - SES, 2011; Figure 20
113 - Geovac, 2012; Figure 1 and Table 3

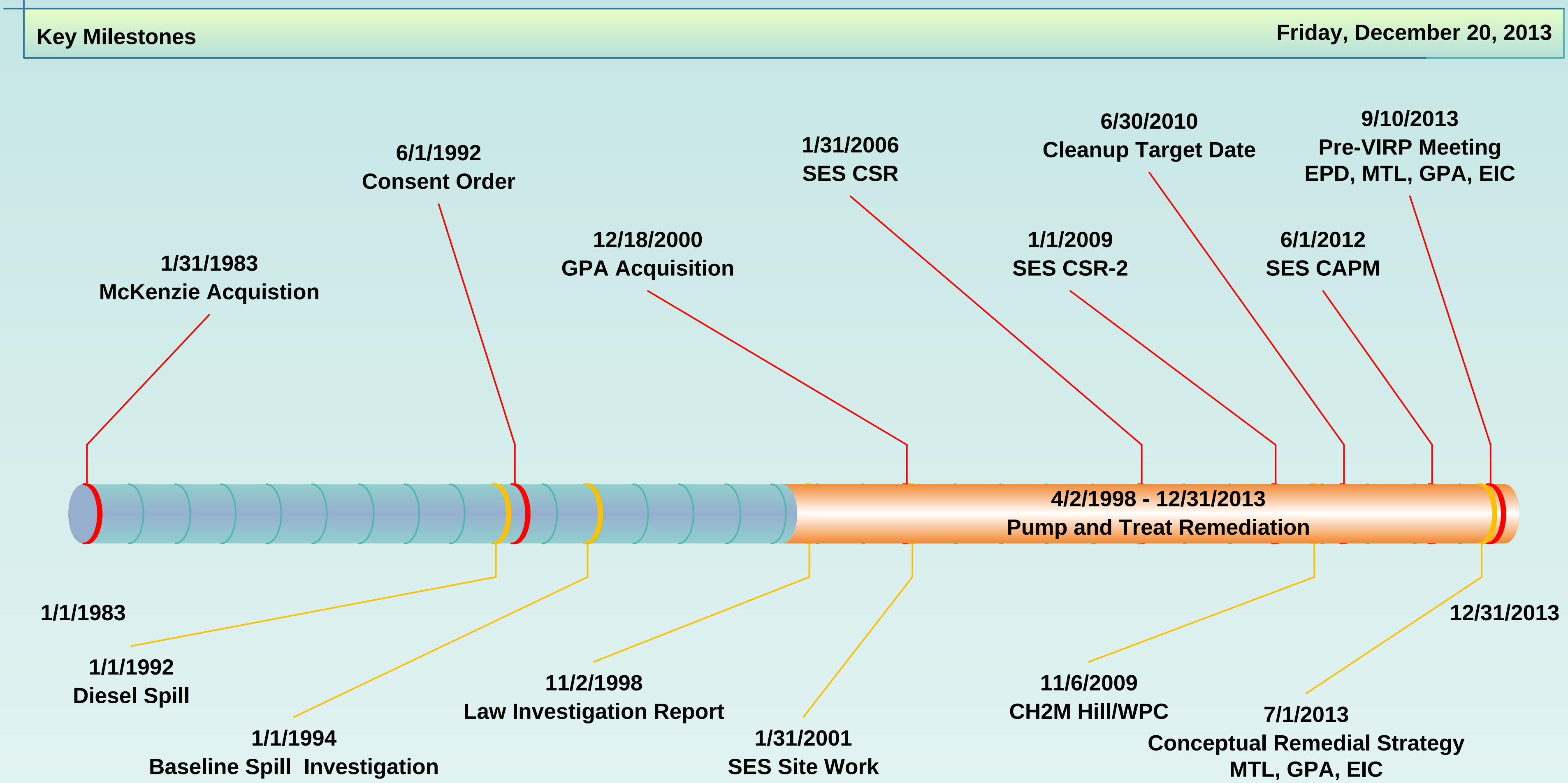
# VIRP APPLICATION

## FIGURES



GRID NORTH
GRANGE ROAD
EDGE OF PAVEMENT
EDGE OF PAVEMENT
SWAMP
SWAMP
EXISTING BERM
TOE OF BERM
TOP OF BERM
TOE OF BERM
FORM THIS POINT TO GRANGE ROAD THE WATER IS OVERFLOWING THE DITCH BANK DITCH AS SHOWN IS APPROXIMATE
CITY OF PORT WENTWORTH STORM WATER DITCH
EDGE OF WATER
EDGE OF WATER
DITCH
FORMER OFFICE AND SHOP
POSSIBLE SINK HOLES
DRAINAGE PIPE
TIRE SHOP (FORMER WASH RACK)
FORMER HOLDING POND
FORMER DIESEL AST
FORMER POND
FORMER FUEL ISLAND
CURRENT WASH RACK
PVC
PERCOLATION POND
STORMWATER DRAINAGE PIPE (TYP.)
EARTH BRIDGE
RODERICK STEELE ROAD
U.S. HIGHWAY 17
EDGE OF PAVEMENT
EDGE OF PAVEMENT
EDGE OF WATER
EDGE OF WATER
MW-5
MW-1S-R
MW-1S
MW-6S
MW-16S
MW-11D
MW-7S
PAW-1
PAW-2
105 MW PAW 1
MW-104
MW-10S-R
MW-10S
MW-28
RW-4
MW-2S
RW-1
MW-2D
PAW-4
PAW-3
MW-12DD
RW-2
RW-5
MW-29
MW-27
G-17
MW-33
MW-26
MW-102
MW-101
MW-9S
MW-8S
MW-8D
MW-103
MW-36
MW-9D
RW-3
MW-4S
MW-4D
MW-3S
RW-7
RW-6
MW-35
MW-15S
MW-15D
PAW-6
PAW-5
MW-13D
MW-13S
MW-32
MW-31
MW-14D
MW-30
G-18
G-22
G-19
0' 60' 120' 180'
Graphic Scale 1" = 60'
LEGEND
MW-15S LOCATION OF KNOWN WELLS
MW-15D LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS
MCKENZIE PROPERTY BOUNDARY
WATER FEATURES
CHAIN LINK FENCE
FIGURE 1-1: Site Map
DESIGNED BY: A.S.
DRAWN BY: A.P.G.
CHECKED BY: A.S.
APPROVED BY: R.M.
REVISIONS
NO. DATE
SEAL:
McKENZIE TANK LINES
111 GRANGE ROAD
Port Wentworth, Georgia 31407
EIC
ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA, GEORGIA 30009
SCALE: See Bar Scale
DATE: 12/18/2013
FILE: McKenzie Base Map.dwg
SHEET NO.:

# Figure 1-2: Milestone Chart, Former McKenzie Site, Port Wentworth, GA



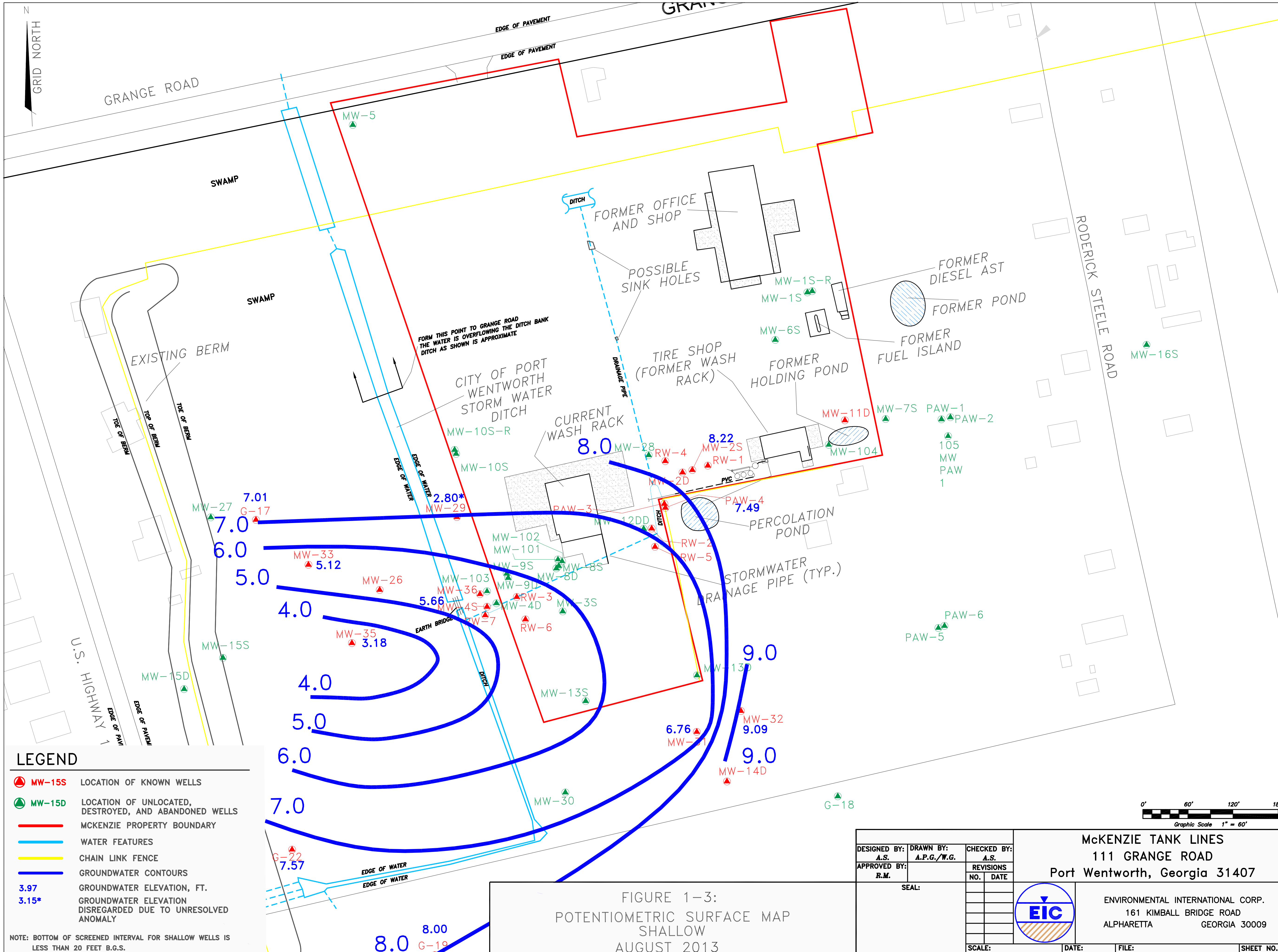
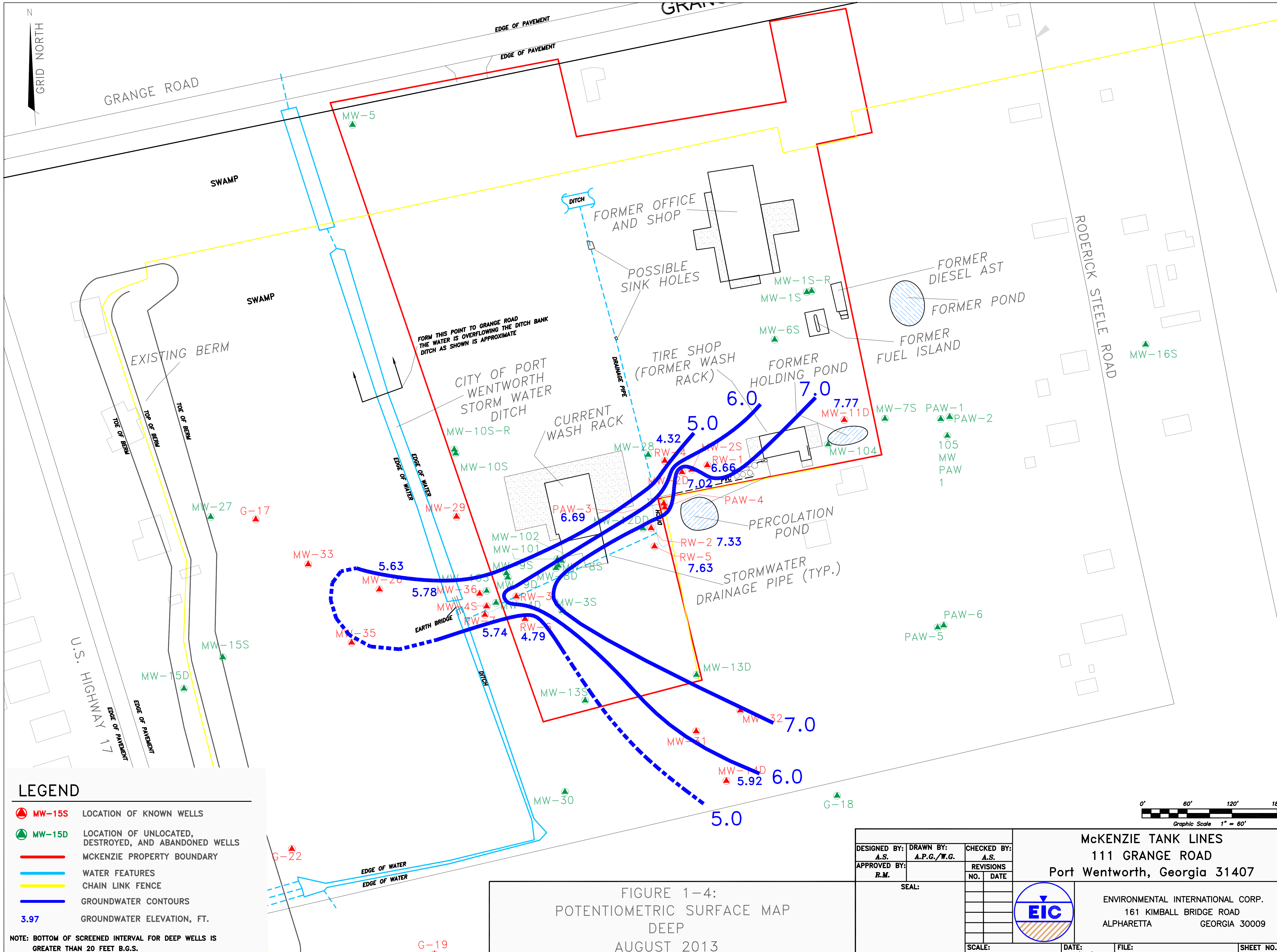



FIGURE 1-3:
POTENTIOMETRIC SURFACE MAP
SHALLOW
AUGUST 2013




## LEGEND

| | |
|---|---|
| MW-15S | LOCATION OF KNOWN WELLS |
| MW-15D | LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS |
| | MCKENZIE PROPERTY BOUNDARY |
| | WATER FEATURES |
| | CHAIN LINK FENCE |
| | GROUNDWATER CONTOURS |
| 3.97 | GROUNDWATER ELEVATION, FT. |

NOTE: BOTTOM OF SCREENED INTERVAL FOR DEEP WELLS IS GREATER THAN 20 FEET B.G.S.

FIGURE 1-4:
POTENTIOMETRIC SURFACE MAP
DEEP
AUGUST 2013

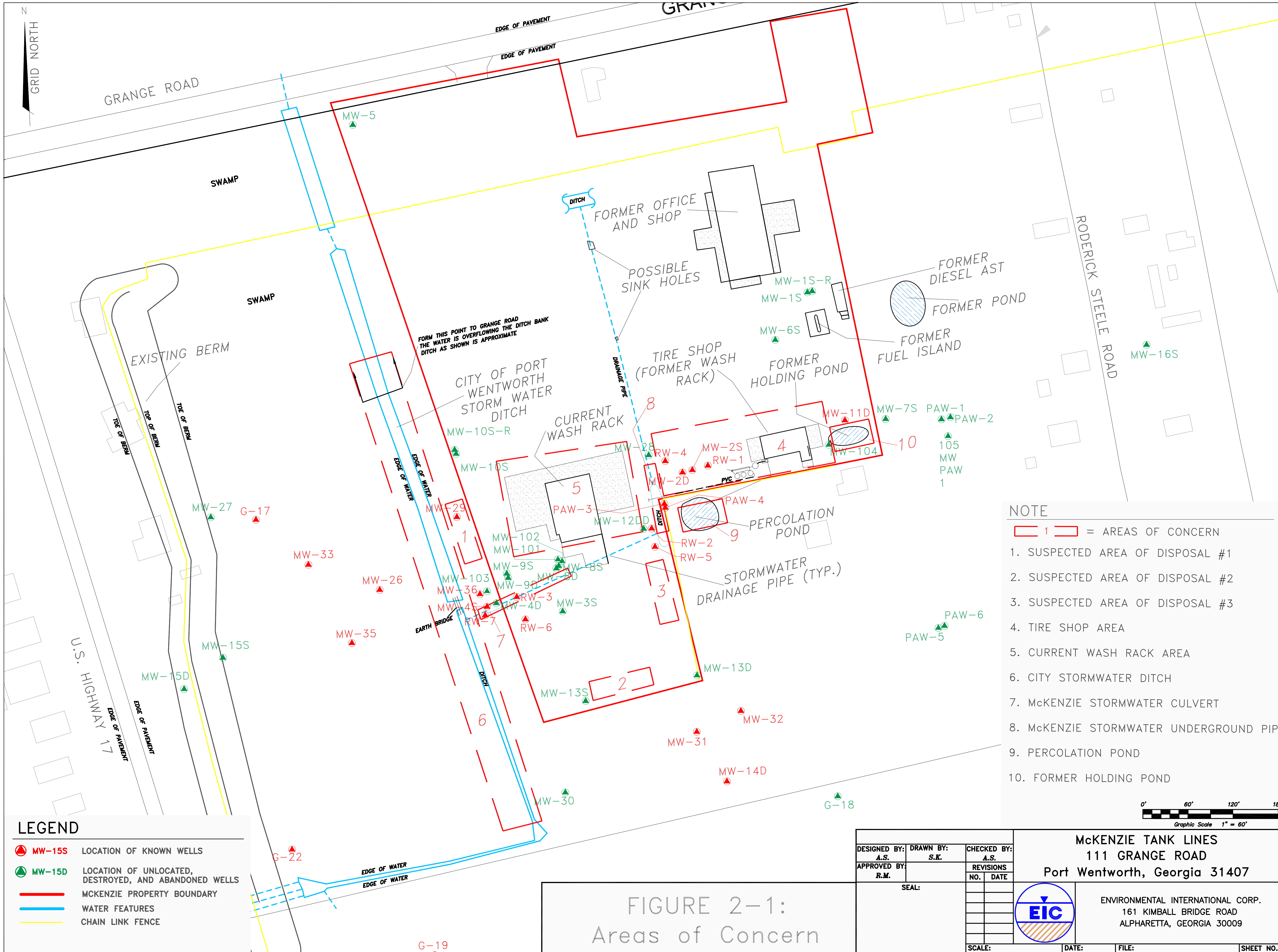
DESIGNED BY: A.S.
DRAWN BY: A.P.G./W.G.
CHECKED BY: A.S.
APPROVED BY: R.M.
REVISIONS NO. DATE
SEAL:

McKENZIE TANK LINES
111 GRANGE ROAD
Port Wentworth, Georgia 31407

EIC

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE
DATE: 12/20/2013
FILE: McKenzie Base Map.dwg
SHEET NO.:




## LEGEND

| | |
|---|---|
| MW-15S | LOCATION OF KNOWN WELLS |
| MW-15D | LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS |
| | MCKENZIE PROPERTY BOUNDARY |
| | WATER FEATURES |
| | CHAIN LINK FENCE |

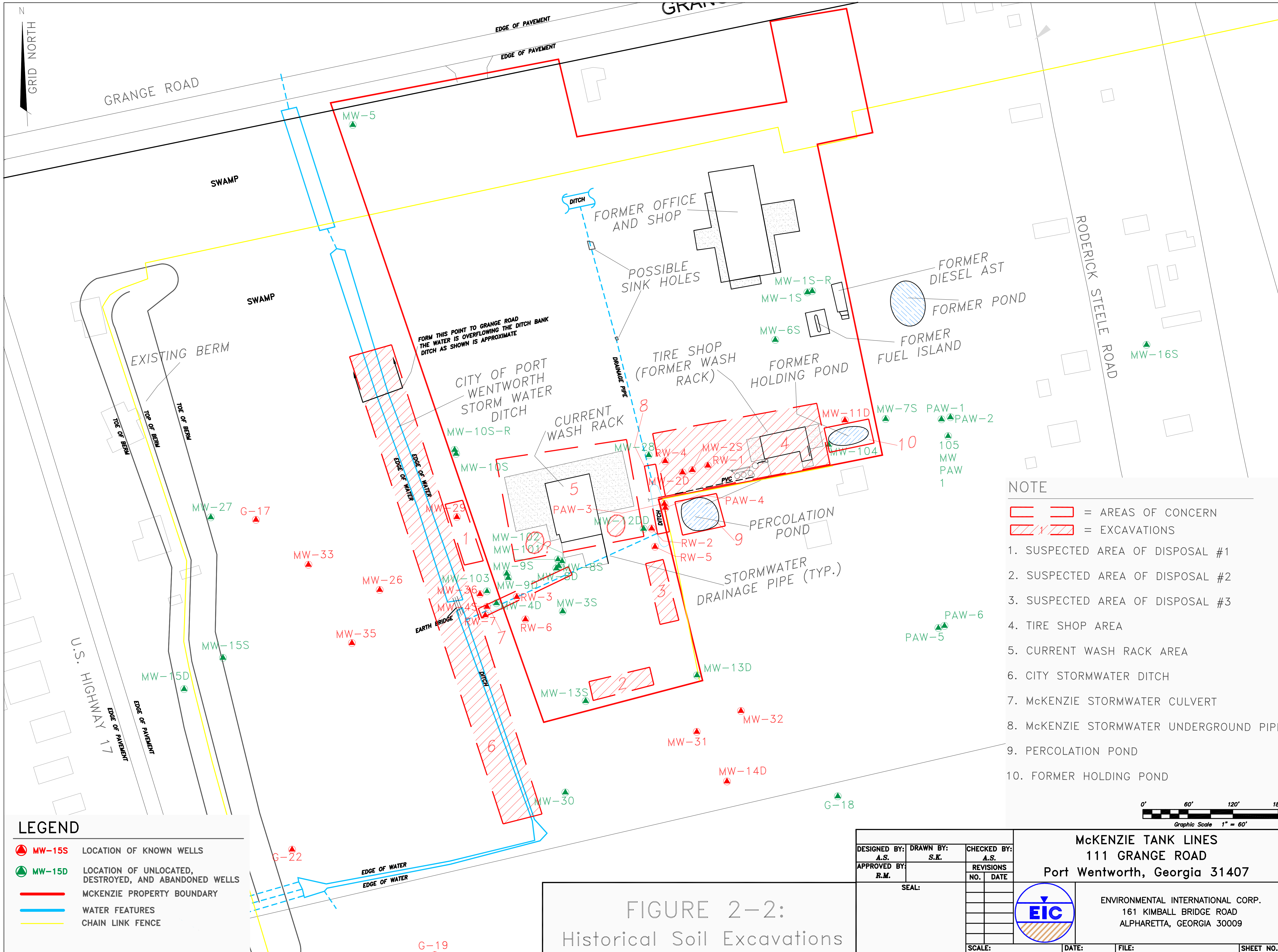
## NOTE

1 = AREAS OF CONCERN

1. SUSPECTED AREA OF DISPOSAL #1
2. SUSPECTED AREA OF DISPOSAL #2
3. SUSPECTED AREA OF DISPOSAL #3
4. TIRE SHOP AREA
5. CURRENT WASH RACK AREA
6. CITY STORMWATER DITCH
7. McKENZIE STORMWATER CULVERT
8. McKENZIE STORMWATER UNDERGROUND PIPE
9. PERCOLATION POND
10. FORMER HOLDING POND

# FIGURE 2-1: Areas of Concern

| | | | |
|---|---|---|---|
| DESIGNED BY: A.S. | DRAWN BY: S.K. | CHECKED BY: A.S. | McKENZIE TANK LINES<br>111 GRANGE ROAD<br>Port Wentworth, Georgia 31407 |
| APPROVED BY: R.M. | | REVISIONS NO. DATE | |
| SEAL: | | | EIC<br>ENVIRONMENTAL INTERNATIONAL CORP.<br>161 KIMBALL BRIDGE ROAD<br>ALPHARETTA, GEORGIA 30009 |
| SCALE: See Bar Scale | DATE: 10/10/2013 | FILE: McKenzie Base Map.dwg | SHEET NO.: |




LEGEND

- MW-15S — LOCATION OF KNOWN WELLS
- MW-15D — LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS
- MCKENZIE PROPERTY BOUNDARY
- WATER FEATURES
- CHAIN LINK FENCE

NOTE

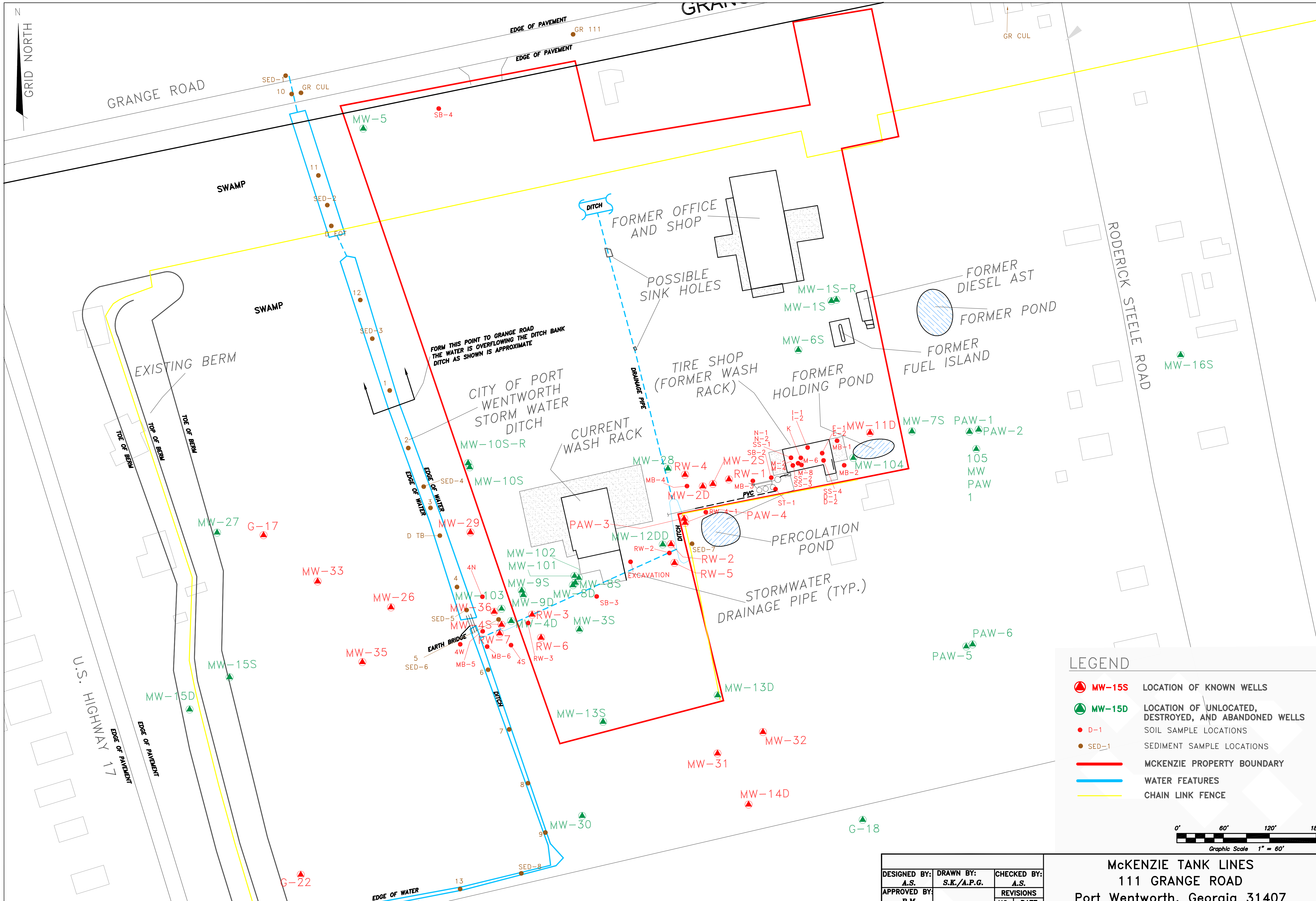
= AREAS OF CONCERN

= EXCAVATIONS

1. SUSPECTED AREA OF DISPOSAL #1
2. SUSPECTED AREA OF DISPOSAL #2
3. SUSPECTED AREA OF DISPOSAL #3
4. TIRE SHOP AREA
5. CURRENT WASH RACK AREA
6. CITY STORMWATER DITCH
7. McKENZIE STORMWATER CULVERT
8. McKENZIE STORMWATER UNDERGROUND PIPE
9. PERCOLATION POND
10. FORMER HOLDING POND

FIGURE 2-2:
Historical Soil Excavations

| DESIGNED BY: A.S. | DRAWN BY: S.K. | CHECKED BY: A.S. | McKENZIE TANK LINES<br>111 GRANGE ROAD<br>Port Wentworth, Georgia 31407 |
|---|---|---|---|
| APPROVED BY: R.M. | | REVISIONS NO. DATE | |
| SEAL: | | | EIC — ENVIRONMENTAL INTERNATIONAL CORP.<br>161 KIMBALL BRIDGE ROAD<br>ALPHARETTA, GEORGIA 30009 |
| SCALE: See Bar Scale | DATE: 10/10/2013 | FILE: McKenzie Base Map.dwg | SHEET NO.: |




# FIGURE 2-3: Post Excavation Assessment

| DESIGNED BY: A.S. | DRAWN BY: S.K./A.P.G. | CHECKED BY: A.S. |
|---|---|---|
| APPROVED BY: R.M. | | REVISIONS: NO. / DATE |
| | SEAL: | |

McKENZIE TANK LINES
111 GRANGE ROAD
Port Wentworth, Georgia 31407

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA, GEORGIA 30009

| SCALE: | DATE: | FILE: | SHEET NO.: |
|---|---|---|---|
| See Bar Scale | 11/22/2013 | McKenzie Base Map.dwg | |

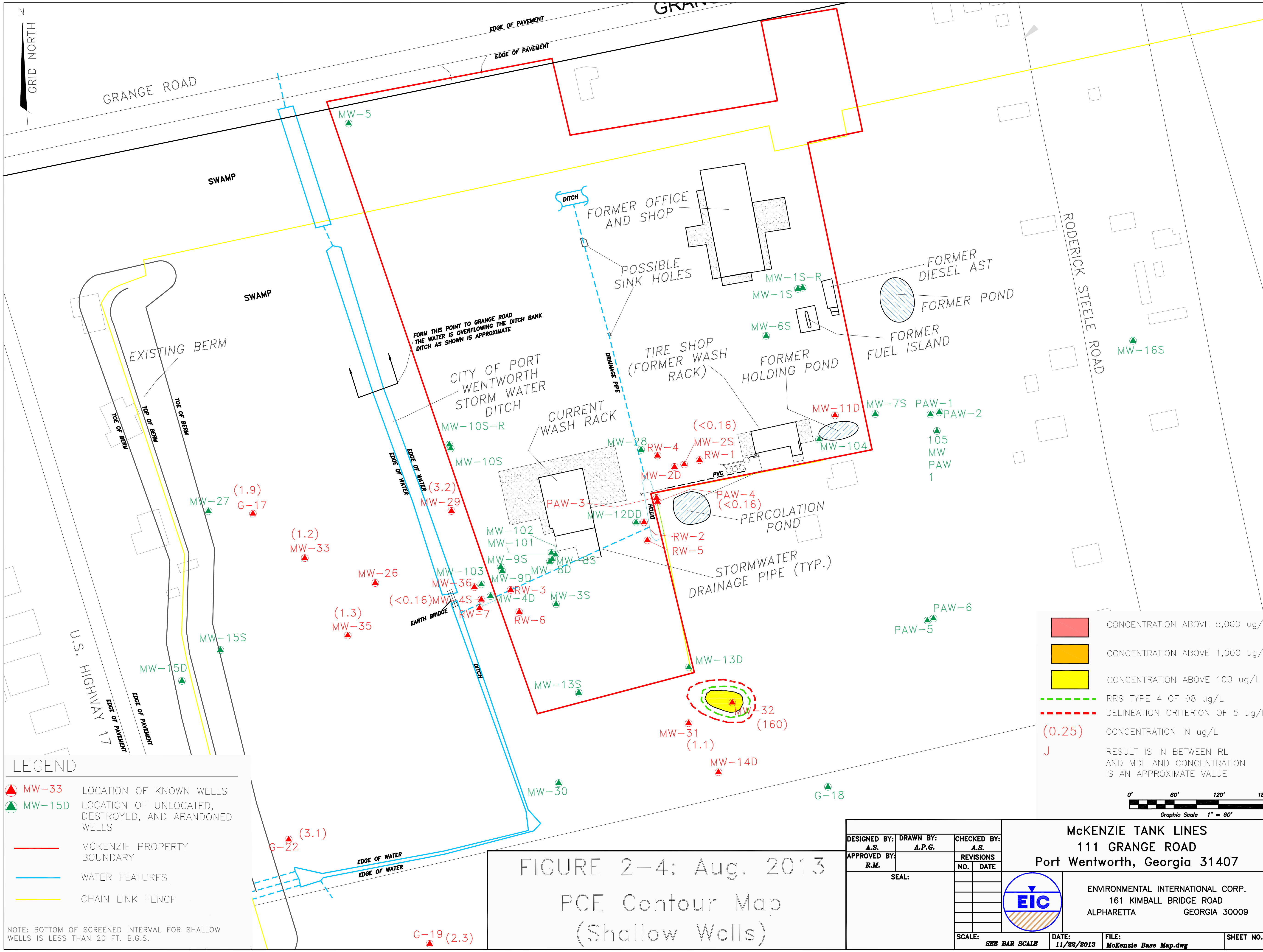
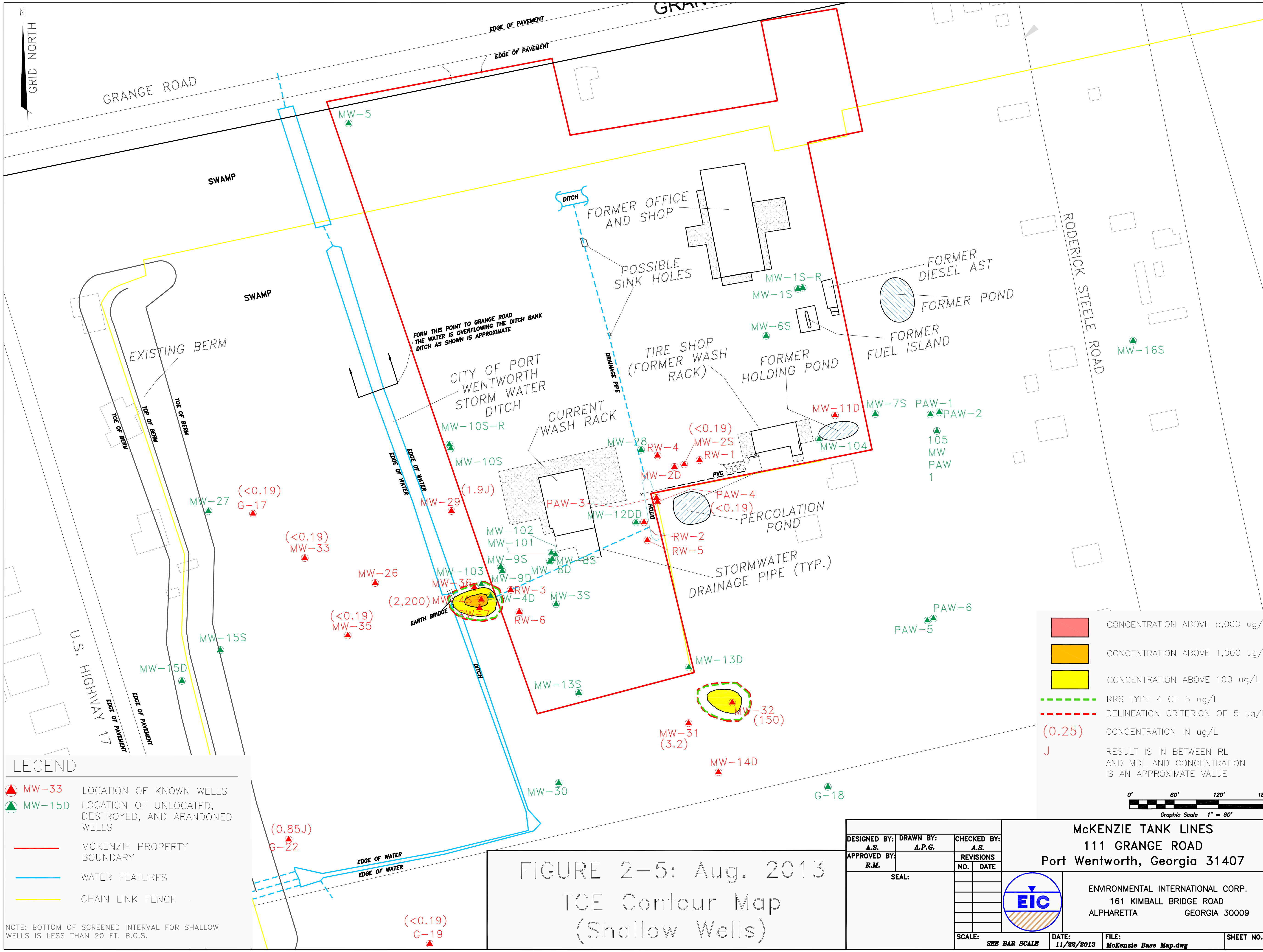



FIGURE 2-4: Aug. 2013 PCE Contour Map (Shallow Wells)




CONCENTRATION ABOVE 5,000 ug/L

CONCENTRATION ABOVE 1,000 ug/L

CONCENTRATION ABOVE 100 ug/L

RRS TYPE 4 OF 5 ug/L

DELINEATION CRITERION OF 5 ug/L

(0.25) CONCENTRATION IN ug/L

J RESULT IS IN BETWEEN RL AND MDL AND CONCENTRATION IS AN APPROXIMATE VALUE

LEGEND

MW-33 LOCATION OF KNOWN WELLS

MW-15D LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS

MCKENZIE PROPERTY BOUNDARY

WATER FEATURES

CHAIN LINK FENCE

NOTE: BOTTOM OF SCREENED INTERVAL FOR SHALLOW WELLS IS LESS THAN 20 FT. B.G.S.

# FIGURE 2-5: Aug. 2013 TCE Contour Map (Shallow Wells)

| DESIGNED BY: A.S. | DRAWN BY: A.P.G. | CHECKED BY: A.S. |
|---|---|---|
| APPROVED BY: R.M. | | REVISIONS NO. DATE |
| SEAL: | | |

McKENZIE TANK LINES
111 GRANGE ROAD
Port Wentworth, Georgia 31407

EIC
ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 11/22/2013 | FILE: McKenzie Base Map.dwg | SHEET NO.:

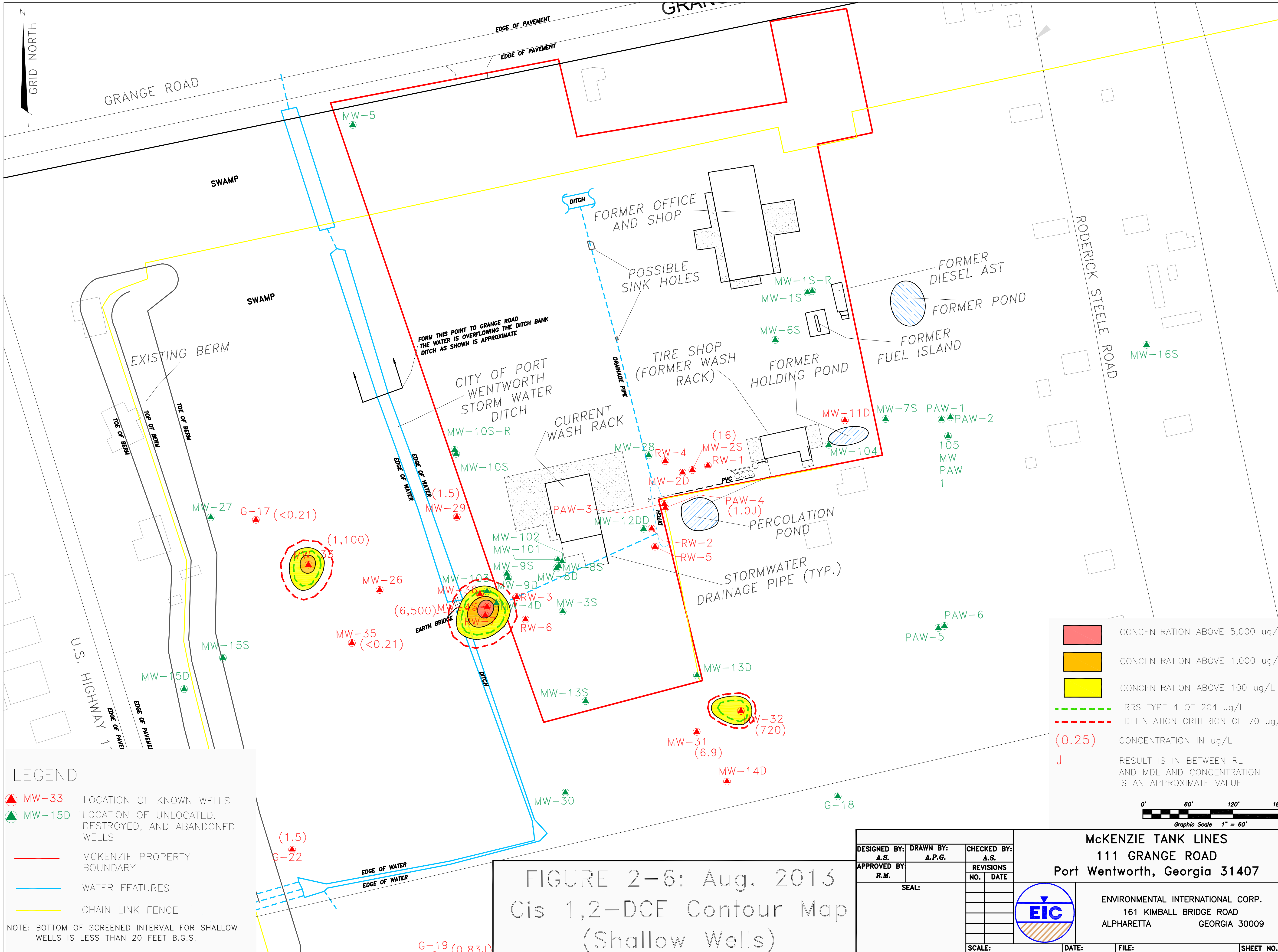


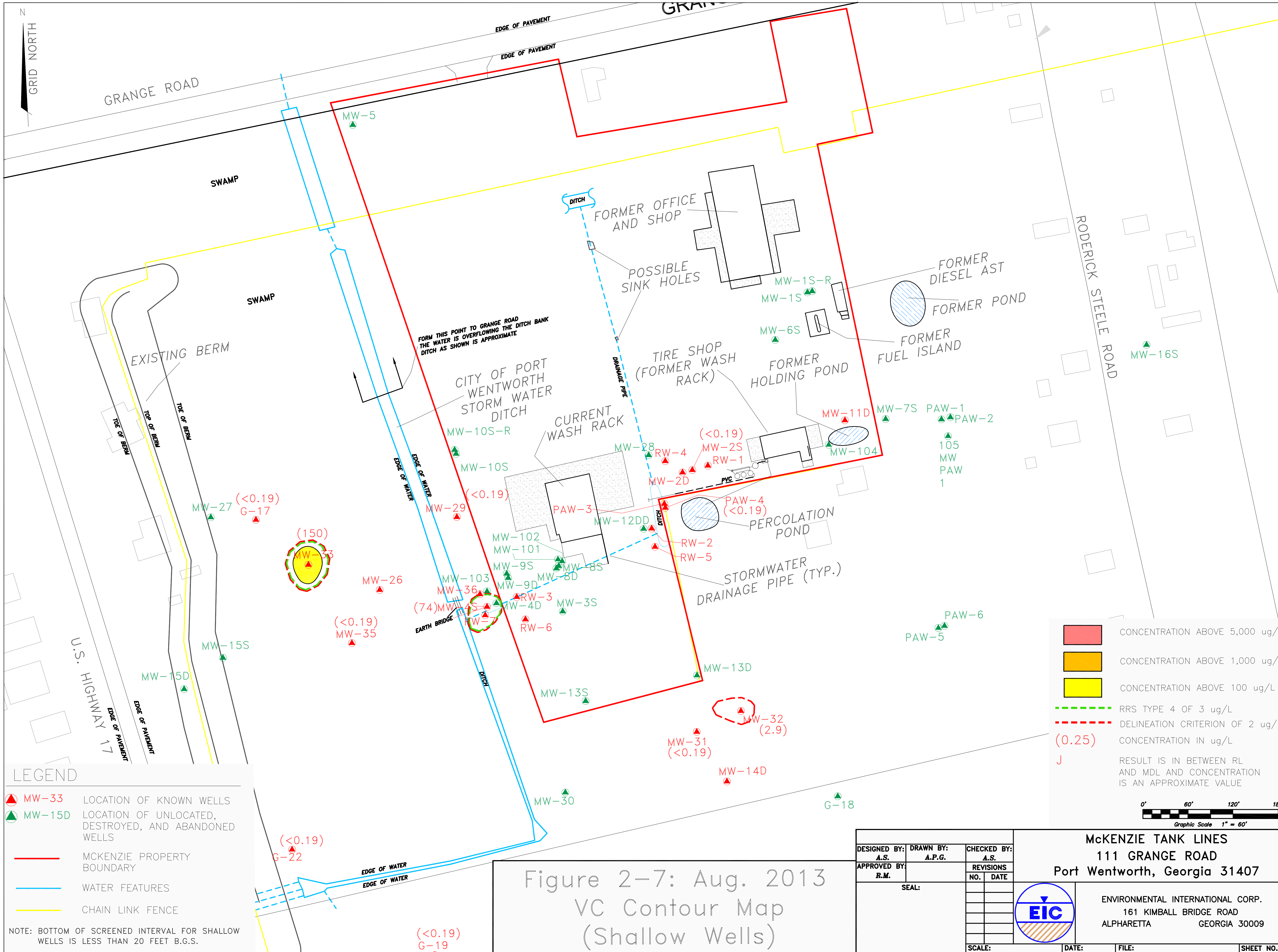

FIGURE 2-6: Aug. 2013
Cis 1,2-DCE Contour Map
(Shallow Wells)

| DESIGNED BY: A.S. | DRAWN BY: A.P.G. | CHECKED BY: A.S. |
|---|---|---|
| APPROVED BY: R.M. | | REVISIONS NO. DATE |
| SEAL: | | |

McKENZIE TANK LINES
111 GRANGE ROAD
Port Wentworth, Georgia 31407

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 11/22/2013 | FILE: McKenzie Base Map.dwg | SHEET NO.:




LEGEND

| | |
|---|---|
| MW-33 | LOCATION OF KNOWN WELLS |
| MW-15D | LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS |
| | MCKENZIE PROPERTY BOUNDARY |
| | WATER FEATURES |
| | CHAIN LINK FENCE |

NOTE: BOTTOM OF SCREENED INTERVAL FOR SHALLOW WELLS IS LESS THAN 20 FEET B.G.S.

| | |
|---|---|
| | CONCENTRATION ABOVE 5,000 ug/L |
| | CONCENTRATION ABOVE 1,000 ug/L |
| | CONCENTRATION ABOVE 100 ug/L |
| | RRS TYPE 4 OF 3 ug/L |
| | DELINEATION CRITERION OF 2 ug/L |
| (0.25) | CONCENTRATION IN ug/L |
| J | RESULT IS IN BETWEEN RL AND MDL AND CONCENTRATION IS AN APPROXIMATE VALUE |

0' 60' 120' 180'
Graphic Scale 1" = 60'

# Figure 2-7: Aug. 2013 VC Contour Map (Shallow Wells)

| DESIGNED BY: A.S. | DRAWN BY: A.P.G. | CHECKED BY: A.S. | McKENZIE TANK LINES 111 GRANGE ROAD Port Wentworth, Georgia 31407 |
|---|---|---|---|
| APPROVED BY: R.M. | | REVISIONS NO. DATE | |
| SEAL: | | | EIC ENVIRONMENTAL INTERNATIONAL CORP. 161 KIMBALL BRIDGE ROAD ALPHARETTA GEORGIA 30009 |
| SCALE: SEE BAR SCALE | DATE: 11/22/2013 | FILE: McKenzie Base Map.dwg | SHEET NO.: |

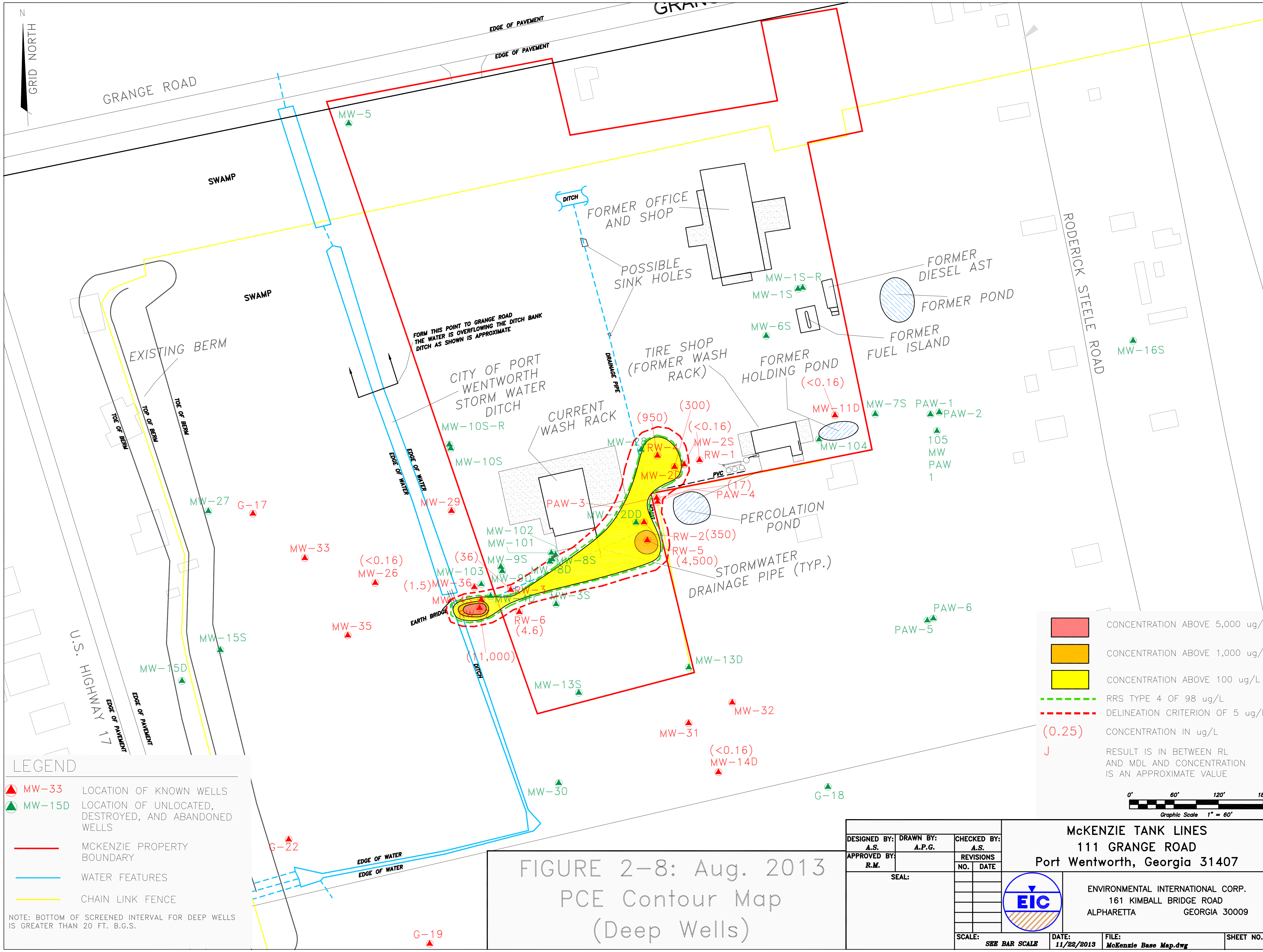



FIGURE 2-8: Aug. 2013 PCE Contour Map (Deep Wells)

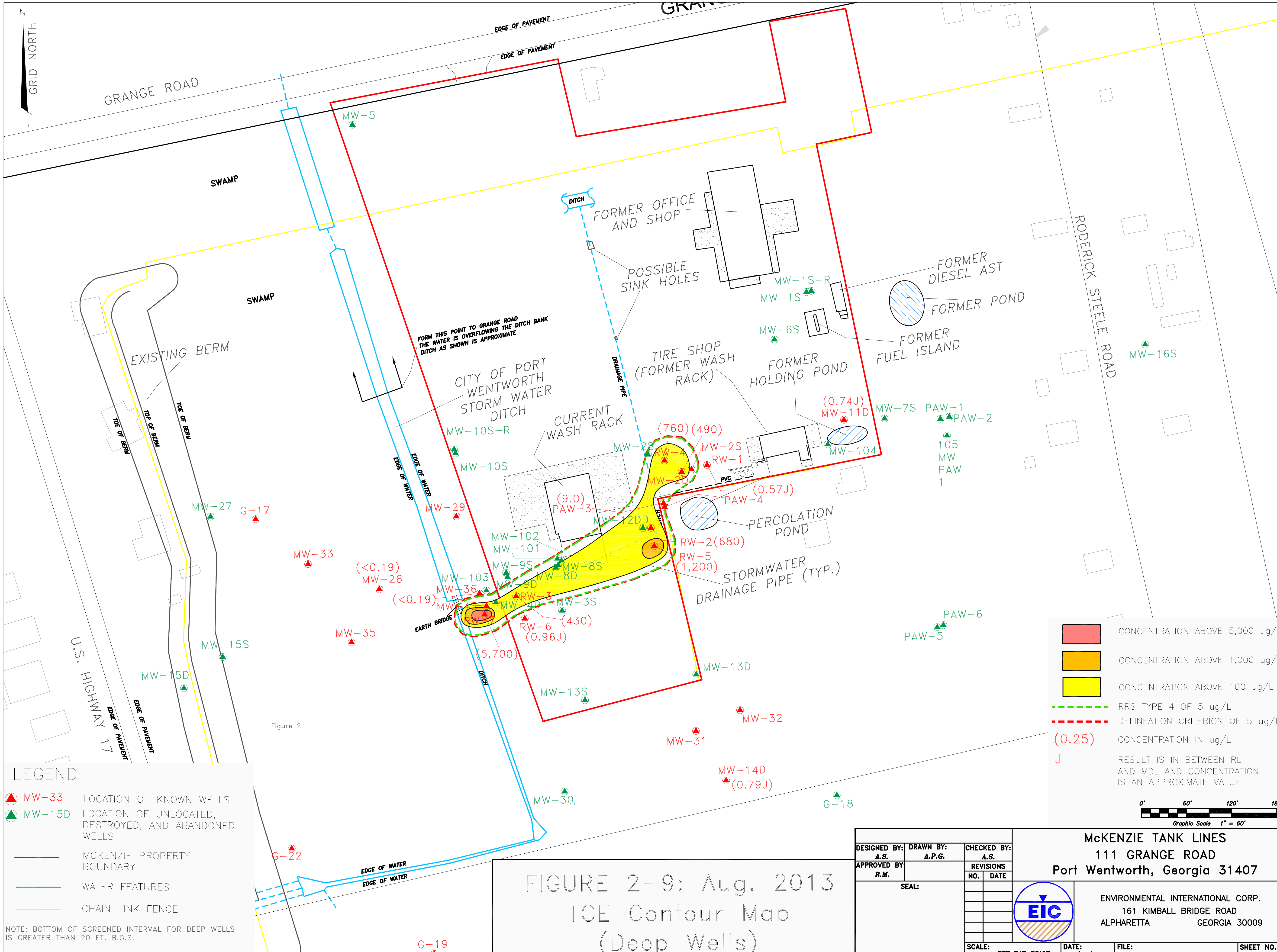
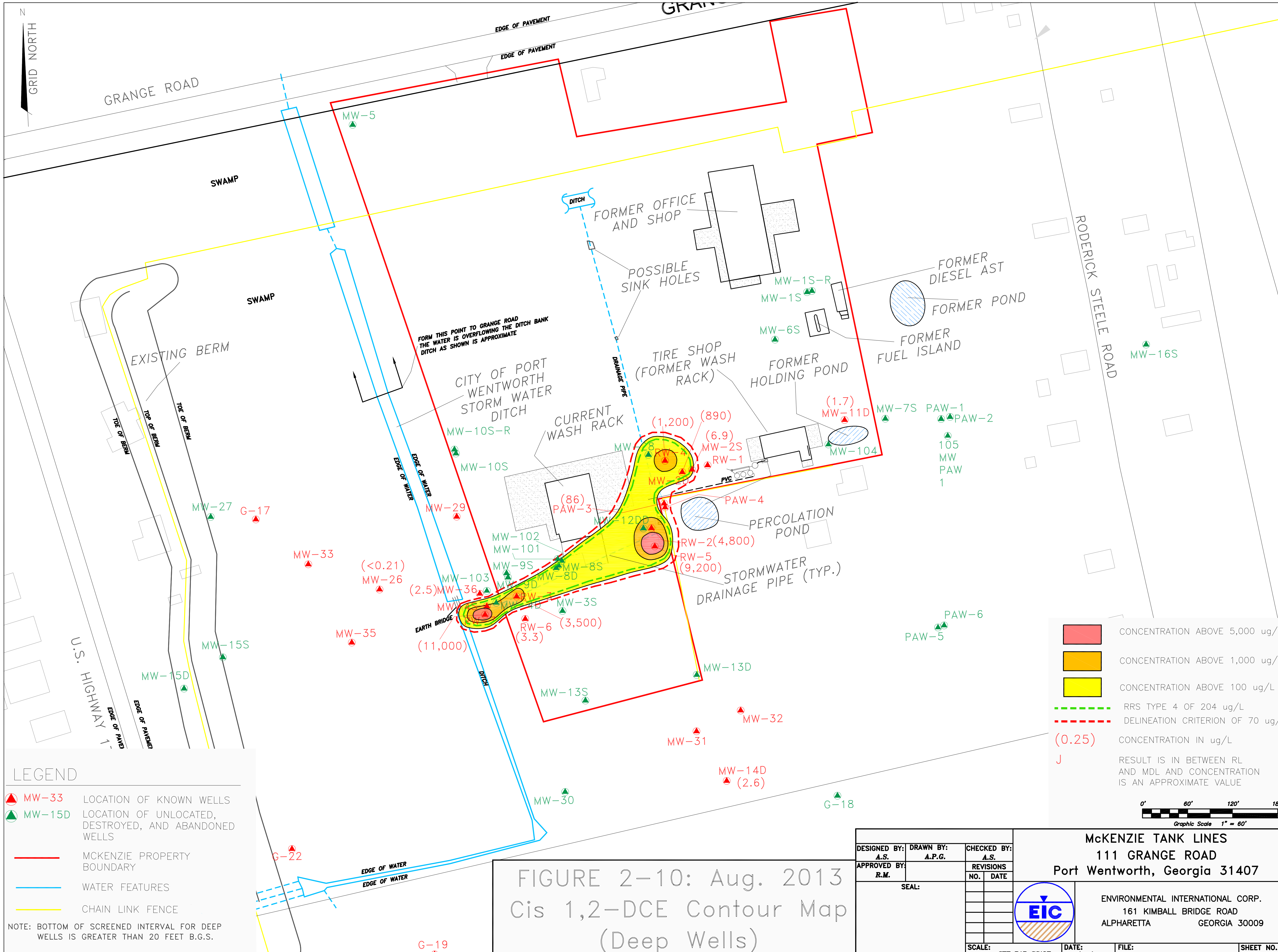



FIGURE 2-9: Aug. 2013 TCE Contour Map (Deep Wells)




LEGEND

| | |
|---|---|
| MW-33 | LOCATION OF KNOWN WELLS |
| MW-15D | LOCATION OF UNLOCATED, DESTROYED, AND ABANDONED WELLS |
| (red line) | MCKENZIE PROPERTY BOUNDARY |
| (blue line) | WATER FEATURES |
| (yellow line) | CHAIN LINK FENCE |

NOTE: BOTTOM OF SCREENED INTERVAL FOR DEEP WELLS IS GREATER THAN 20 FEET B.G.S.

CONCENTRATION ABOVE 5,000 ug/L
CONCENTRATION ABOVE 1,000 ug/L
CONCENTRATION ABOVE 100 ug/L
RRS TYPE 4 OF 204 ug/L
DELINEATION CRITERION OF 70 ug/L
(0.25) CONCENTRATION IN ug/L
J RESULT IS IN BETWEEN RL AND MDL AND CONCENTRATION IS AN APPROXIMATE VALUE

0' 60' 120' 180'
Graphic Scale 1" = 60'

# FIGURE 2-10: Aug. 2013 Cis 1,2-DCE Contour Map (Deep Wells)

DESIGNED BY: A.S. | DRAWN BY: A.P.G. | CHECKED BY: A.S. | APPROVED BY: R.M. | SEAL:
REVISIONS — NO. | DATE

McKENZIE TANK LINES
111 GRANGE ROAD
Port Wentworth, Georgia 31407

EIC
ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 11/22/2013 | FILE: McKenzie Base Map.dwg | SHEET NO.:

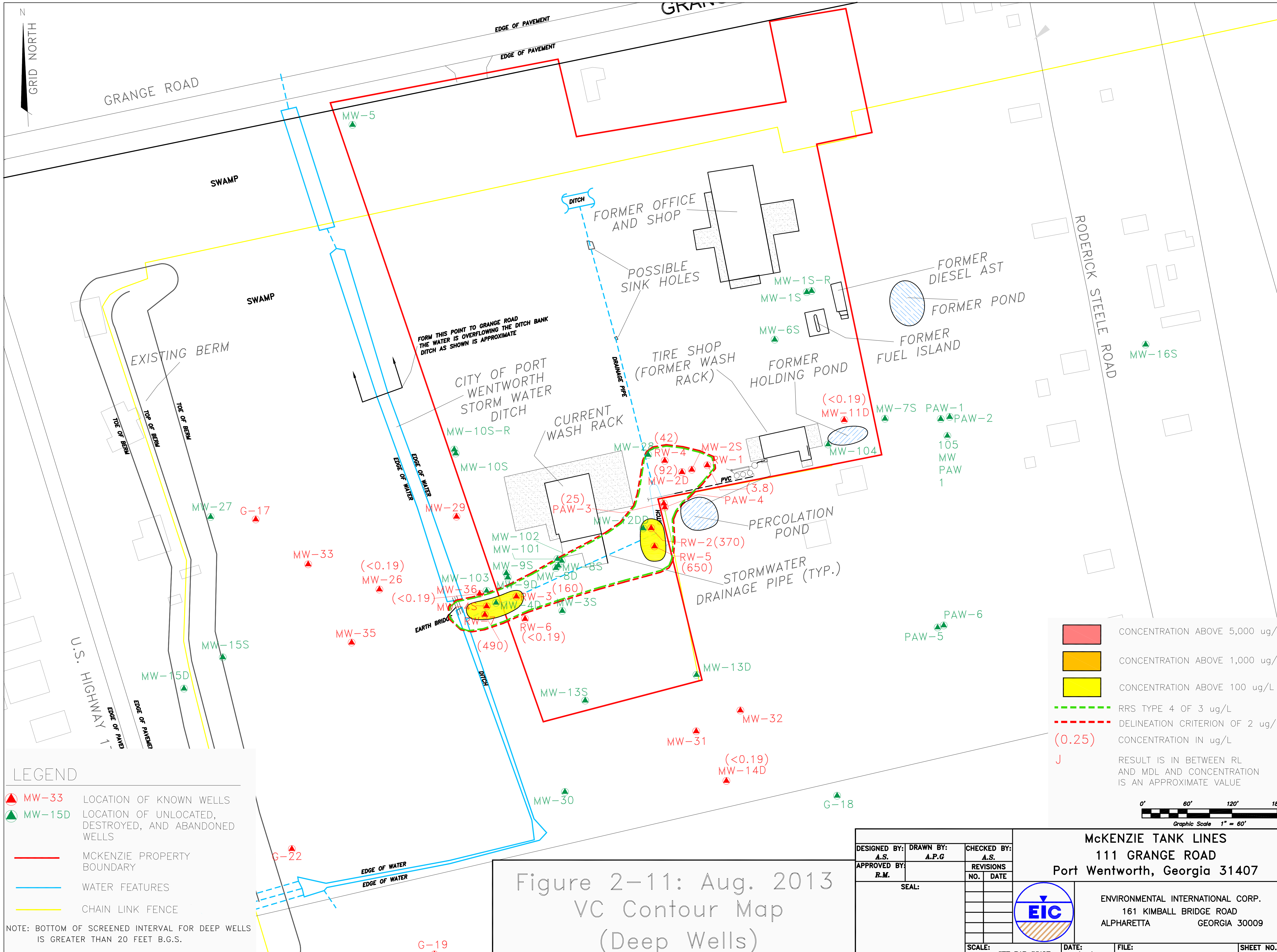
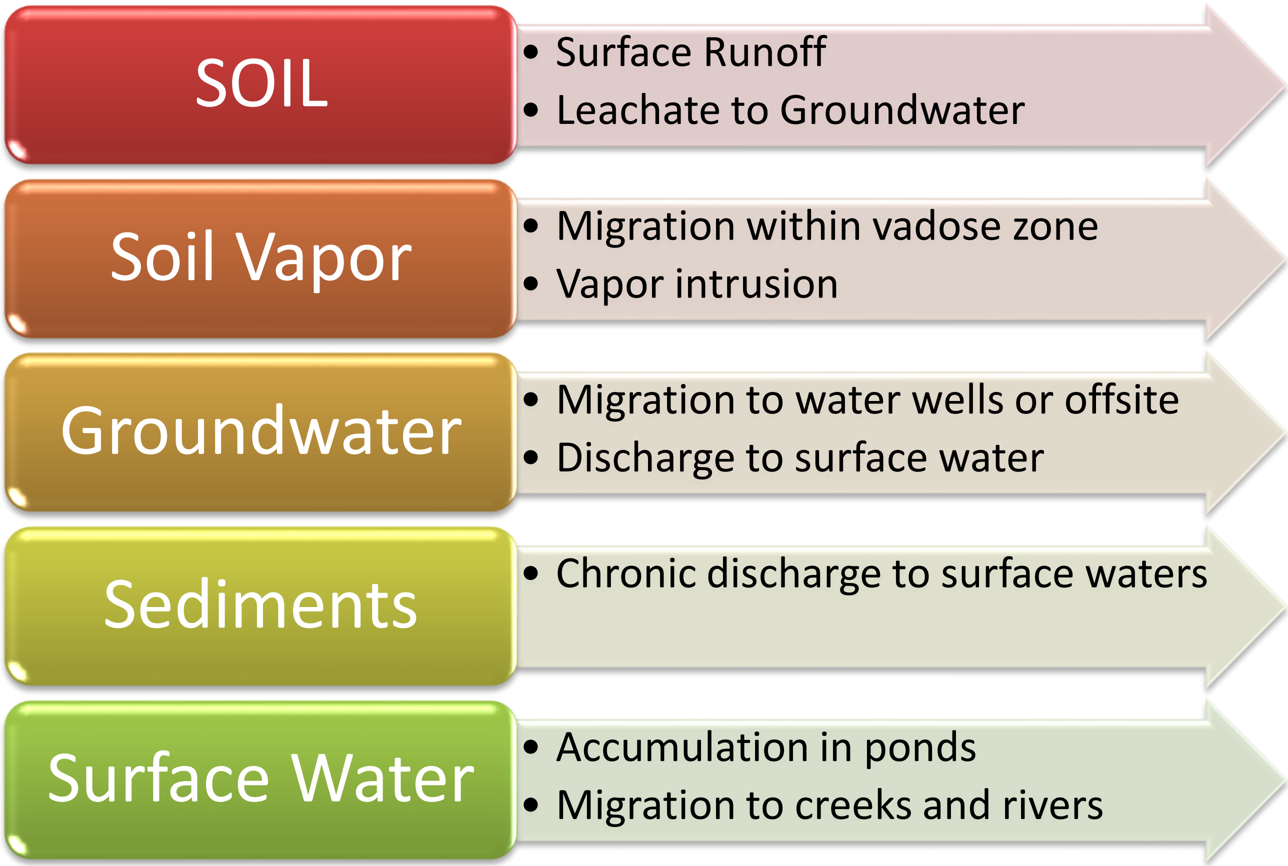
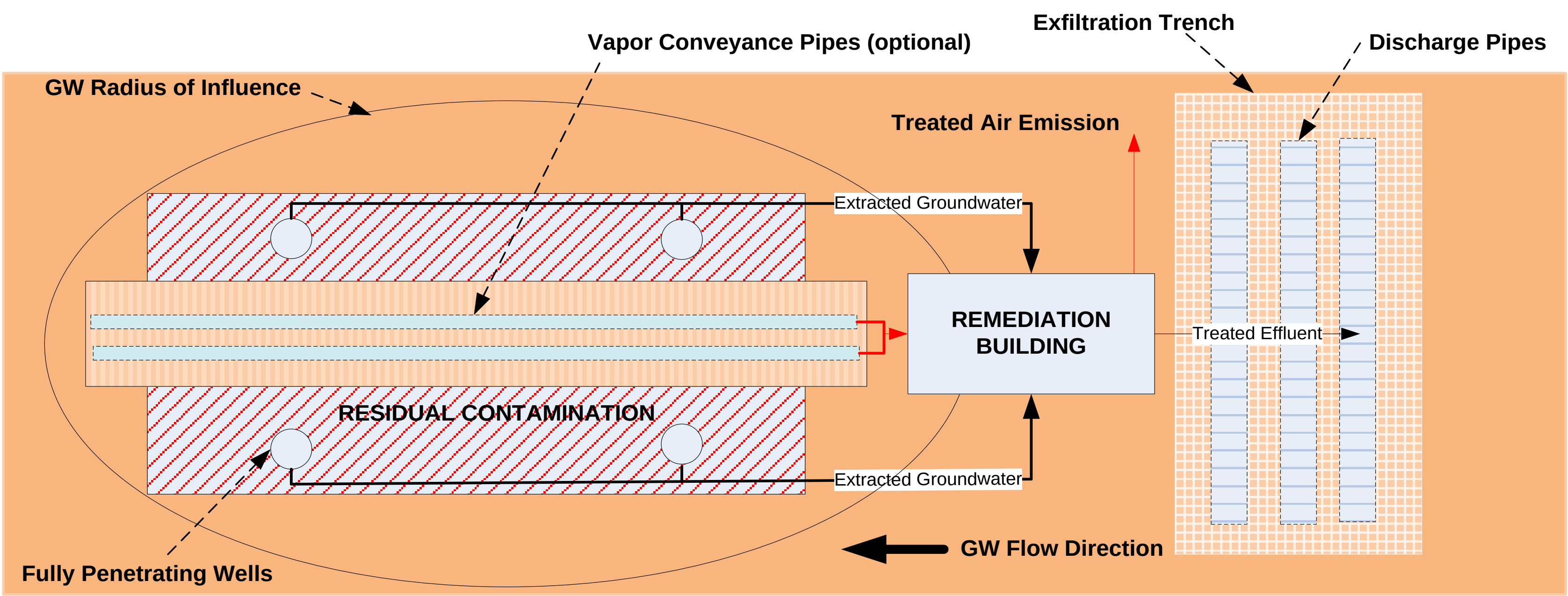



Figure 2-11: Aug. 2013 VC Contour Map (Deep Wells)

# Figure 2-12: Potential COC Migration Pathways

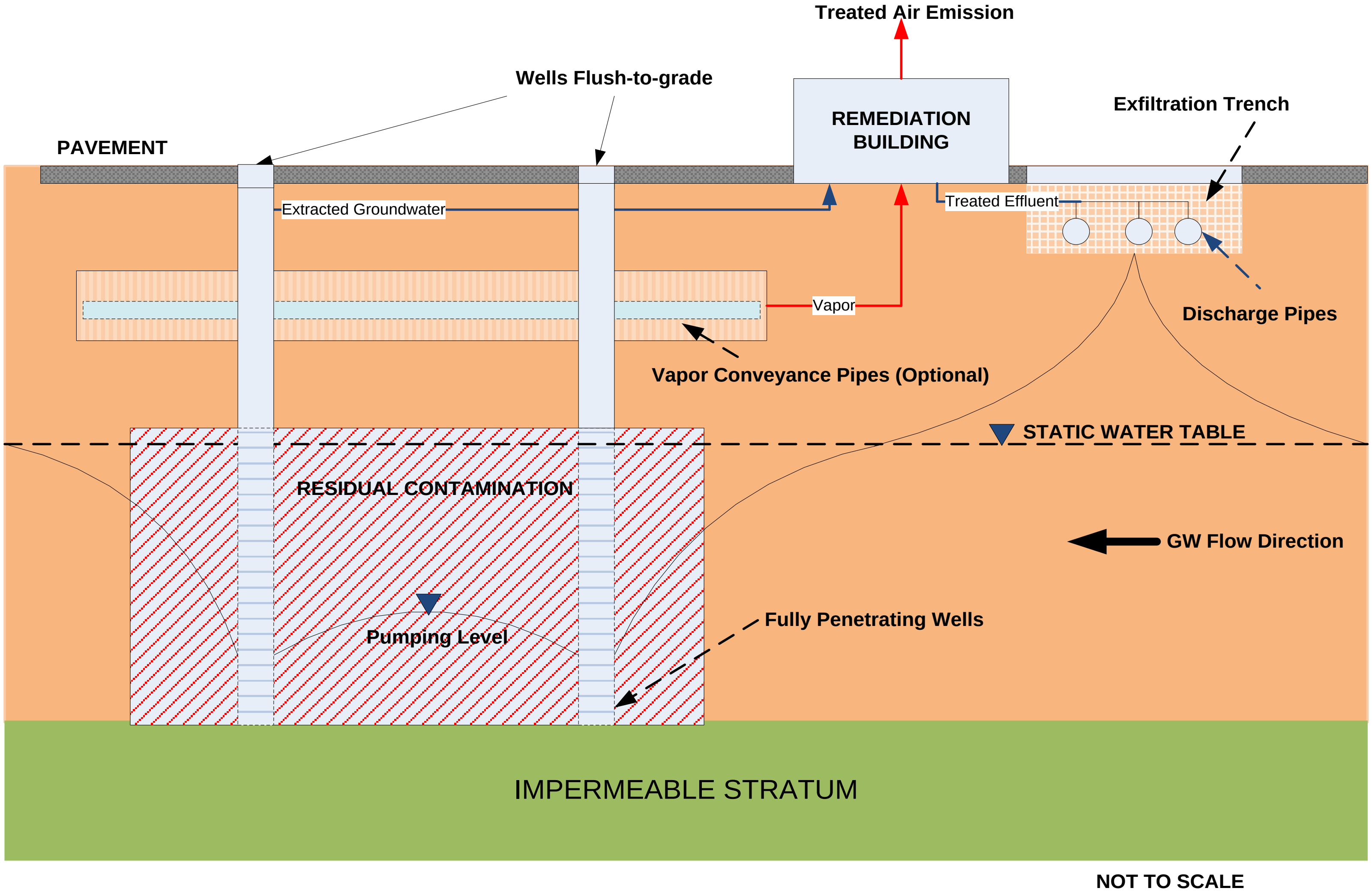


# Figure 4-1: Conceptual layout – Plan View




NOT TO SCALE

# Figure 4-2: Conceptual layout – Sectional View



# FIGURE 5-1: PROJECTED SCHEDULE

| Step | Task Name | Start | Finish | Duration |
|---|---|---|---|---|
| 1 | DELINEATION | 1/1/2014 | 12/30/2014 | 52w |
| 2 | ENHANCED ATTENUATION | 1/1/2015 | 12/30/2015 | 52w |
| 3 | MONITORING PROGRAM | 12/1/2015 | 12/31/2018 | 161w |
| 4 | EA CONFIRMATION | 1/1/2015 | 12/31/2018 | 208.6w |
| 5 | SITE CLOSURE | 1/1/2019 | 6/28/2019 | 25.8w |

Note: The schedule will be updated to reflect VIRP approval date

# VIRP APPLICATION

## ATTACHMENT A

# Voluntary Investigation and Remediation Plan Application Form and Checklist

| VRP APPLICANT INFORMATION | | | | | |
|---|---|---|---|---|---|
| COMPANY NAME | McKenzie Tank Lines | | | | |
| CONTACT PERSON/TITLE | 975 Appleyard Drive | | | | |
| ADDRESS | Tallahassee, Florida 32304 | | | | |
| PHONE | 850-350-2249 | FAX | 407-479-3492 | E-MAIL | tfp@msn.com |

| GEORGIA CERTIFIED PROFESSIONAL GEOLOGIST OR PROFESSIONAL ENGINEER OVERSEEING CLEANUP | | | | | |
|---|---|---|---|---|---|
| NAME | Raj Mahadevaiah | | | GA PE/PG NUMBER | 23198 |
| COMPANY | Environmental International Corporation | | | | |
| ADDRESS | 161 Kimball Bridge Road, Suite 100, Alpharetta, GA 30009 | | | | |
| PHONE | 770-772-7100 | FAX | 770-772-0555 | E-MAIL | rajmahadevaiah@eicusa.com |

## APPLICANT'S CERTIFICATION

In order to be considered a qualifying property for the VRP:

(1) The property must have a release of regulated substances into the environment;
(2) The property shall not be:
- (A) Listed on the federal National Priorities List pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601.
- (B) Currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency; or
- (C) A facility required to have a permit under Code Section 12-8-66.

(3) Qualifying the property under this part would not violate the terms and conditions under which the division operates and administers remedial programs by delegation or similar authorization from the United States Environmental Protection Agency.
(4) Any lien filed under subsection (e) of Code Section 12-8-96 or subsection (b) of Code Section 12-13-12 against the property shall be satisfied or settled and released by the director pursuant to Code Section 12-8-94 or Code Section 12-13-6.

In order to be considered a participant under the VRP:
- (1) The participant must be the property owner of the voluntary remediation property or have express permission to enter another's property to perform corrective action.
- (2) The participant must not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also certify that this property is eligible for the Voluntary Remediation Program (VRP) as defined in Code Section 12-8-105 and I am eligible as a participant as defined in Code Section 12-8-106.

| APPLICANT'S SIGNATURE | Thomas F. Panebianco | | |
|---|---|---|---|
| APPLICANT'S NAME/TITLE (PRINT) | Thomas F. Panebianco, General Counsel | DATE 01/29/2014 | |

| QUALIFYING PROPERTY INFORMATION (For additional qualifying properties, please refer to the last page of application form) | | | |
|---|---|---|---|
| **HAZARDOUS SITE INVENTORY INFORMATION (if applicable)** | | | |
| HSI Number | 10406 | Date HSI Site listed | January 5, 1996 |
| HSI Facility Name | McKenzie Tank Lines | NAICS CODE | |
| **PROPERTY INFORMATION** | | | |
| TAX PARCEL ID | Land Lot 30, Tax Parcel ID 1-0729-01-007 & 1-0729-01-009 (See Attachments C, D, & E) | PROPERTY SIZE (ACRES) | 9.2 |
| PROPERTY ADDRESS | 111 Grange Road | | |
| CITY | Port Wentworth | COUNTY | Chatham |
| STATE | GA | ZIPCODE | 31407 |
| LATITUDE (decimal format) | 32.496 | LONGITUDE (decimal format) | 81.550 |
| **PROPERTY OWNER INFORMATION** | | | |
| PROPERTY OWNER(S) | Georgia Ports Authority | PHONE # | 912-964-3922 |
| MAILING ADDRESS | Mr. Christopher Novack, PO Box 2406 | | |
| CITY | Savannah | STATE/ZIPCODE | Georgia, 31402 |

| ITEM # | DESCRIPTION OF REQUIREMENT | Location in VRP (i.e. pg., Table #, Figure #, etc.) | For EPD Comment Only (Leave Blank) |
|---|---|---|---|
| 1. | **$5,000 APPLICATION FEE** IN THE FORM OF A CHECK PAYABLE TO THE GEORGIA DEPARTMENT OF NATURAL RESOURCES. (PLEASE LIST CHECK DATE AND CHECK NUMBER IN COLUMN TITLED "LOCATION IN VRP." PLEASE DO NOT INCLUDE A SCANNED COPY OF CHECK IN ELECTRONIC COPY OF APPLICATION.) | **Check#108648 Dated 1/29/2014 (in a separate envelope)** | |
| 2. | **WARRANTY DEED(S)** FOR QUALIFYING PROPERTY. | **Attachment B** | |
| 3. | **TAX PLAT** OR OTHER FIGURE INCLUDING QUALIFYING PROPERTY BOUNDARIES, ABUTTING PROPERTIES, AND TAX PARCEL IDENTIFICATION NUMBER(S). | **Attachments C-E** | |
| 4. | **ONE (1) PAPER COPY AND TWO (2) COMPACT DISC (CD) COPIES** OF THE VOLUNTARY REMEDIATION PLAN IN A SEARCHABLE PORTABLE DOCUMENT FORMAT (PDF). | **Attached** | |
| 5. | The VRP participant's initial plan and application must include, using all reasonably available current information to the extent known at the time of application, a graphic three-dimensional preliminary conceptual site model (CSM) including a preliminary remediation plan with a table of delineation standards, brief supporting text, charts, and figures (no more than 10 pages, total) that illustrates the site's surface and subsurface setting, the known or suspected source(s) of contamination, how contamination might move within the environment, the potential human health and ecological receptors, and the complete or incomplete exposure pathways that may exist at the site; the preliminary CSM must be updated as the investigation and remediation progresses and an up-to-date CSM must be included in each semi-annual status report submitted to the director by the participant; a **PROJECTED MILESTONE SCHEDULE** for investigation and remediation of the site, and after enrollment as a participant, must update the schedule in each semi- | **<u>Conceptual Site Model</u>: Section 2; Tables 2-1 to 2-5; Figures 2-1 to 2-11**<br><br>**<u>Preliminary Remediation Plan</u>: Section 4; Table 4-1; Figure 4-1 to 4-2** | |

| | | | |
|---|---|---|---|
| | annual status report to the director describing implementation of the plan during the preceding period. A Gantt chart format is preferred for the milestone schedule.<br><br>The following four (4) generic milestones are required in all initial plans with the results reported in the participant's next applicable semi-annual reports to the director. The director may extend the time for or waive these or other milestones in the participant's plan where the director determines, based on a showing by the participant, that a longer time period is reasonably necessary: | **<u>Table of Delineation Standards</u>: Section 1.6; Tables 1-1 & 1-2**<br><br>**<u>Surface and Sub-surface Setting</u>: Section 1; Figures 1-1, 1-3 to 1-4; Attachment F & G**<br><br>**<u>Known or Suspected Sources of Contamination</u>: Section 2.1; Table 2-1; Figure 2-1;**<br><br>**<u>Potential Movement of Contamination within the Environment</u>: Section 2.5; Figure 2-4 to 2-12**<br><br>**<u>Potential Human Health and Ecological Receptors</u>: Section 2.6**<br><br>**<u>Complete and/or Incomplete Exposure Pathways</u>: Section 2** | |

| | | | |
|---|---|---|---|
| | | **Projected Schedule:** **Section 5; Figure 5-1** | |
| **5.a.** | Within the first 12 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern on property where access is available at the time of enrollment; | **Section 5.1** | |
| **5.b.** | Within the first 24 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern extending onto property for which access was not available at the time of enrollment; | **Section 5.2** | |
| **5.c.** | Within 30 months after enrollment, the participant must update the site CSM to include vertical delineation, finalize the remediation plan and provide a preliminary cost estimate for implementation of remediation and associated continuing actions; and | **Section 5.3 & 5.4** | |
| **5.d.** | Within 60 months after enrollment, the participant must submit the compliance status report required under the VRP, including the requisite certifications. | **Section 5.5** | |
| **6.** | **SIGNED AND SEALED PE/PG CERTIFICATION** AND SUPPORTING DOCUMENTATION:<br><br>"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.<br><br>Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division.<br><br>The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."<br><br>**BASAVARAJ MAHADEVAIAH, GA # 23198**<br>Printed Name and GA PE/PG Number<br><br>1/29/14<br>Date<br><br>Signature and Stamp<br><br>GEORGIA REGISTERED No. 23198 PROFESSIONAL ENGINEER BASAVARAJ MAHADEVAIAH | | |

# VIRP APPLICATION

## ATTACHMENT B

Clock#: 113261
FILED FOR RECORD

12/21/2000 04:38pm

PAID: 14.00

Susan D. Prouse, Clerk
Superior Court of Chatham County
Chatham County, Georgia

Real Estate Transfer Tax

NO TAX DUE

For Clerk of Superior Court

BOOK 217 M PAGE 194

Prepared by:
Inglesby, Falligant, Horne, Courington & Chisholm, P.C.
P.O. Box 1368
Savannah, GA 31402

STATE OF GEORGIA

COUNTY OF CHATHAM

LAW DEPARTMENT FILE NO. 3000-6-MB-0224-94 (293311)

GENERAL WARRANTY DEED

THIS GENERAL WARRANTY DEED, hereinafter referred to as "Deed," is made this 18th day of December, 2000, by and between MCKENZIE TANK LINES, INC., whose address is P.O. Box 1200, Tallahassee, Florida 32202-4000, Party of the First Part, hereinafter referred to as "Grantor," and the GEORGIA PORTS AUTHORITY, whose address for purposes of this Deed is P.O. BOX 2406, Savannah, Georgia, 31402, Party of the Second Part, hereinafter referred to as "Grantee" (the words "Grantor" and "Grantee" to include their respective heirs, successors and assigns where the context requires or permits.)

W I T N E S S T H  T H A T:

Grantor, for and in consideration of the sum of One Million, Six Hundred and Forty six Thousand and Eight Hundred and 00/100 ($1,646,800.00) Dollars in hand paid at and before the sealing and delivery of these presents, the receipt and sufficiency of which is hereby acknowledged, has bargained, sold, granted, aliened, convey and confirmed, and by these presents does hereby bargain, sell, grant, alien, convey and confirm unto Grantee:

All those tracts or parcels of real property situate, lying and being in the 8th General Militia District, Chatham County, City of Port Wentworth, Georgia, as shown on that plat of survey prepared for the Georgia Ports Authority by E M C Engineering Services, Inc., more particularly Charles W. Tuten, Jr., Georgia Registered Land Surveyor No. 2345, entitled "A Survey of Original Lots 74 through 104 and a portion of Lot 72, Ray Street and an unopened street being a portion of the Grange Subdivision, 8th G.M. District, Port Wentworth, Chatham County, Georgia", a copy of which plat is recorded in Plat Book 13-P, page 93, in the Real Property Records of the Clerk of the Superior Court of Chatham County, Georgia, which plat is incorporated herein and by this reference is made a part hereof and from said plat being more particularly described as follows: Being known as Lot 30 on said plat, beginning at the intersection of the southern right-of-way of Grange Road with the eastern right-of-way of U.S. Highway No. 17 (Port Wentworth Road), and proceeding North 77° 59' 19" East a distance of 799.98 feet to a point near an iron rod found, said point being the POINT OF BEGINNING; thence running Southerly 11° 40' 00" East a distance of 100.00 feet to a point; thence running North 77° 59' 19" East a distance of 295.36 feet to a point; thence running North 11° 40' 00" West a distance of 100.00 feet to a point; thence running North 77° 59' 19" East a distance of 109.90 feet to a point near a concrete monument found; thence running South 11° 40' 00" East a distance of 82.93 feet to a point; thence running North 77° 28' 00" East a distance of 215.02 feet to a point; thence running South 11° 40' 00" East a distance of 80.00 feet to a point; thence running South 77° 28' 00" West a distance of 294.93 feet to a point; thence running South 11° 40' 00" East a distance of 444.01 feet to a point near a concrete marker found; thence running South 78° 43' 40" West a distance of 325.36 feet to a point; thence running South 11° 40' 00" East a distance of 244.97 feet to a point near a iron rod found; thence running South 73° 22' 56" West a distance of 205.26 feet to a point; thence running North 18° 44' 17" West a distance of 870.91 feet along the Eastern right-of-way of the Industrial and Domestic Water Line right-of-way to a point near an iron rod found; thence running North 77° 59' 15" East a distance of 311.73 feet to the POINT OF BEGINNING, City of Port Wentworth, County of Chatham, State of Georgia.

TO HAVE AND HOLD the Property, with all and singular the rights, members and appurtenances thereof, to the same being, belonging or in anywise appertaining, to the only proper use, benefit and behoof of Grantee forever in FEE SIMPLE.

AND Grantor will warrant and forever defend the right and title to the Property unto Grantee against the claims of all persons whomsoever.

BOOK 217 PAGE 196

IN WITNESS WHEREOF, Grantor has caused its duly authorized officers to sign and seal this Deed, on the day, month and year first above written.

Grantor

MCKENZIE TANK LINES, INC.

By: [signature] (James C. Shaeffer)
Title: President/CEO

Attest: Kathy Dunnigan (Kathy Dunnigan)
Title: Administrative Assistant

State of Florida
County of Leon

Signed, sealed and delivered,
as to Grantor, in our presence:

Ashley Wright (Ashley Wright)
Unofficial Witness

Joyce C. Hill (Joyce C. Hill)
Official Witness, Notary Public

"Personally Known."

My Commission Expires: 9-3-03

Joyce C. Hill MY COMMISSION EXPIRES September 3, 2003 #CC850768 Bonded thru Troy Fain-Insurance NOTARY PUBLIC, STATE OF FLORIDA

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# VIRP APPLICATION

## ATTACHMENT C


Source: Chatham County Board of Tax Assessors Office GIS Database, October 16, 2013

# Attachment C: McKenzie Property Map

## Property Owner

- Georgia Ports Authority
- Georgia Power Company
- American Warehousing IV, LLC
- Imperial Savannah, LP
- Norfolk Southern Corp
- Southern Region Industrial REA

Scale: 1:9,600

0 480 960 Feet

N

McKenzie Tank Lines Boundary

1-0805-01-004 Chatham County Parcel Pin Number

Seal:

| Date: 11/1/2013 | |
|---|---|
| Designed By: WG | Drawn By: WG |
| Checked By: AS | Approved By: RM |

# VIRP APPLICATION

## ATTACHMENT D

**Attachment D: Current Site Property and Surrounding Properties Owner Database**

| Parcel ID | Property Owner | Property Owner Address | Lot Size (Acres) |
|---|---|---|---|
| 7-0016-01-067 | American Warehousing IV, LLC | 3222 Country Club Drive, Valdosta, GA 31605 | 1.2 |
| 1-0729-01-007 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 18.2 |
| 1-0729-01-008 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 43.2 |
| 1-0729-01-009 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 44.4 |
| 1-0730-01-001 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 362.8 |
| 1-0730-01-002 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 2.9 |
| 1-0730-01-003 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 3.4 |
| 1-0805-01-003 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 1.9 |
| 1-0805-01-004 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 89.2 |
| 1-0805-01-005 | Georgia Ports Authority | PO BOX 2406, Savannah, GA 31402 | 1.5 |
| 1-0805-01-002 | Georgia Power Company | 241 Ralph McGill Blvd, Atlanta, GA 30308 | 13.5 |
| 7-0015-01-015 | Georgia Power Company | 241 Ralph McGill Blvd, Atlanta, GA 30308 | 1.5 |
| 7-0015-01-002 | Imperial Savannah, LP | 8016 Highway 90-A, Sugar Land, TX 77478 | 34.2 |
| 7-0015-01-017 | Norfolk Southern Corp. | 110 Franklin Rd SE, Roanoke, VA 24042 | 0.3 |
| 7-0015-01-016 | Southern Region Industrial REA | 110 Franklin Rd SE, Roanoke, VA 24042 | 1.1 |

Sources: Chatham County Board of Tax Assessors, Georgia Superior Court Clerks Cooperative Authority

# VIRP APPLICATION

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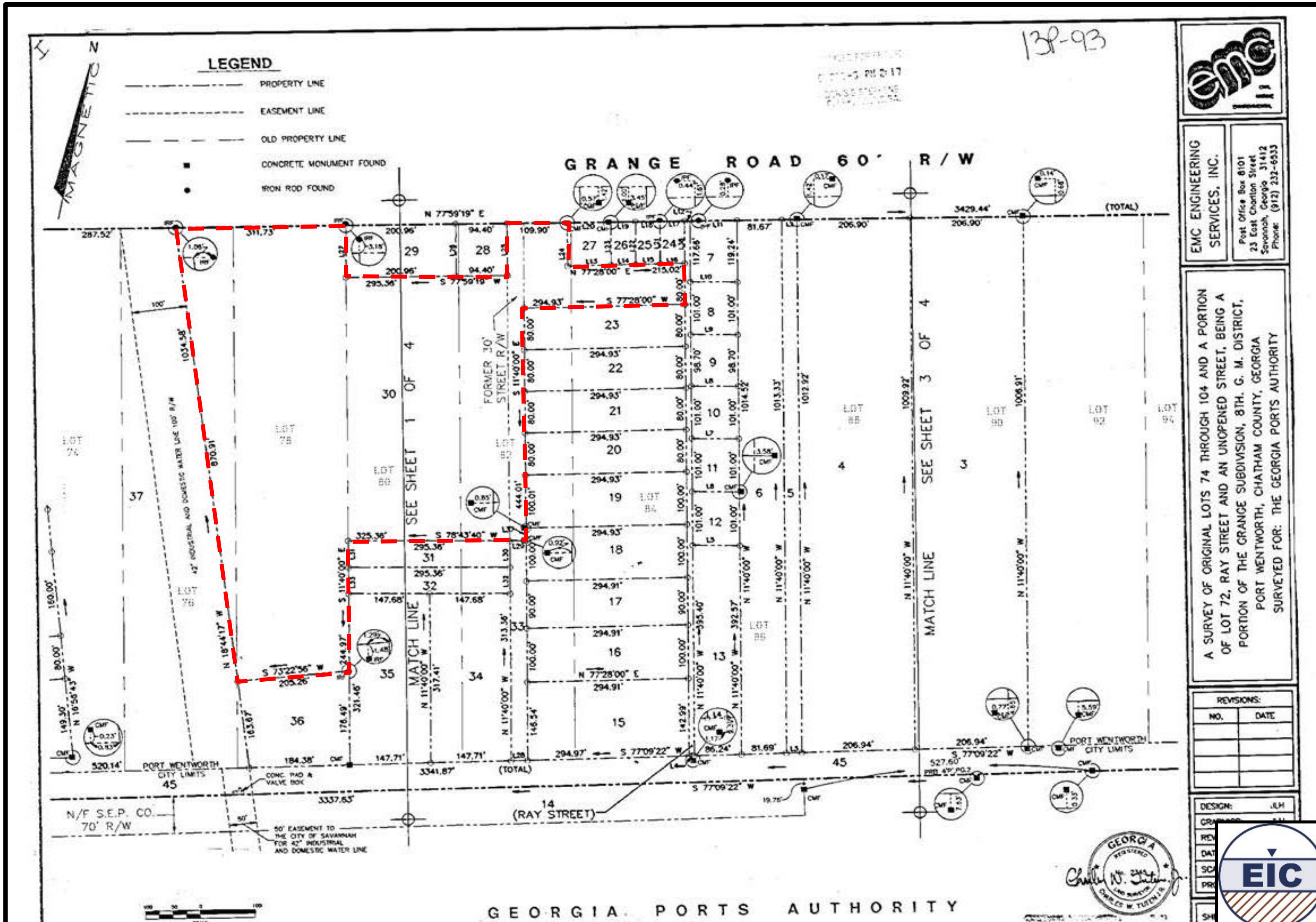
## ATTACHMENT E




Attachment E:

Previous McKenzie Tank Line Boundary, (Plot 30)

Source: EMC Engineering Services, INC., "A survey of original lots 74 through 104 and a portion of lot 72, Ray Street and an unopened street, being a portion of the Grange Subdivision, 8th G.M. District, Port Wentworth, Chatham County, Georgia

# VIRP APPLICATION

## ATTACHMENT F

## GENERALIZED STRATIGRAPHY OF THE SAVANNAH, GEORGIA AREA

| SERIES | GEOLOGIC UNIT | | Depth (ft bls) | LITHOLOGY | HYDROLOGIC PROPERTIES |
|---|---|---|---|---|---|
| PLIOCENE to RECENT | Undifferentiated Sediments, locally including Waccamaw Formation | | | Silt, Sand, Gravel, and Marl of Fluvial and Marine Origin | Water-Bearing (Surficial Aquifer) |
| MIOCENE | HAWTHORN GROUP | | 100 | Dark Green Sandy, Clayey Silt with Tongues of Weathered Limestone | Essentially a Confining Unit (Some Water in Sandy Interbeds) |
| | TAMPA LIMESTONE | | 200 | Calcareous, Argillaceous Sand with Basal Conglomerate | |
| OLIGOCENE | Undifferentiated Rocks | | | Loosely Consolidated Gray to Buff Nodular Limestone | |
| EOCENE | OCALA LIMESTONE | Upper Unit | 300 | White, Crystalline Fossiliferous Limestone | |
| | | Lower Unit | 400<br>500 | Soft, Granular Limestone with Thin Layers of Dense Limestone and Silty, Clayey Marl | FLORIDAN AQUIFER (Abundant Water) |
| | GOSPORT SAND | | 600 | Dense, Sandy, Fossiliferous Limestone and Glauconitic Marl | |
| | LISBON FORMATION | | 700<br>800<br>900 | Soft Limestone with Some Silt, Clay, and Marl | Confining Unit |

–adapted from Counts and Donsky, 1963

REGIONAL STRATIGRAPHIC COLUMN

FIGURE 4

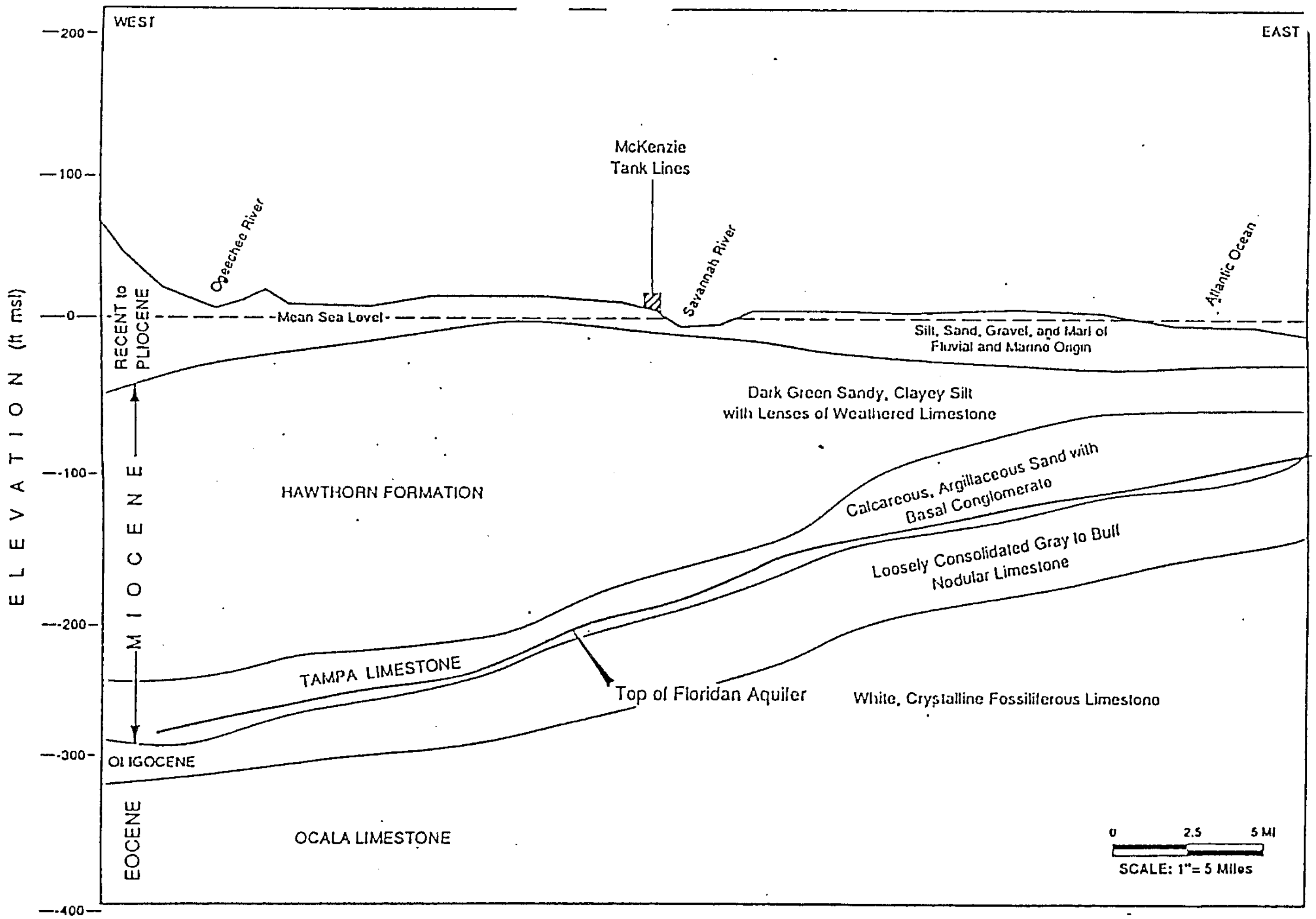
FARLEY-JONES & ASSOCIATES
DAN FARLEY, P.G.

McKENZIE TANK LINES, INC. - SAVANNAH, GA

Source: Farley-Jones 1993

# VIRP APPLICATION

## ATTACHMENT G



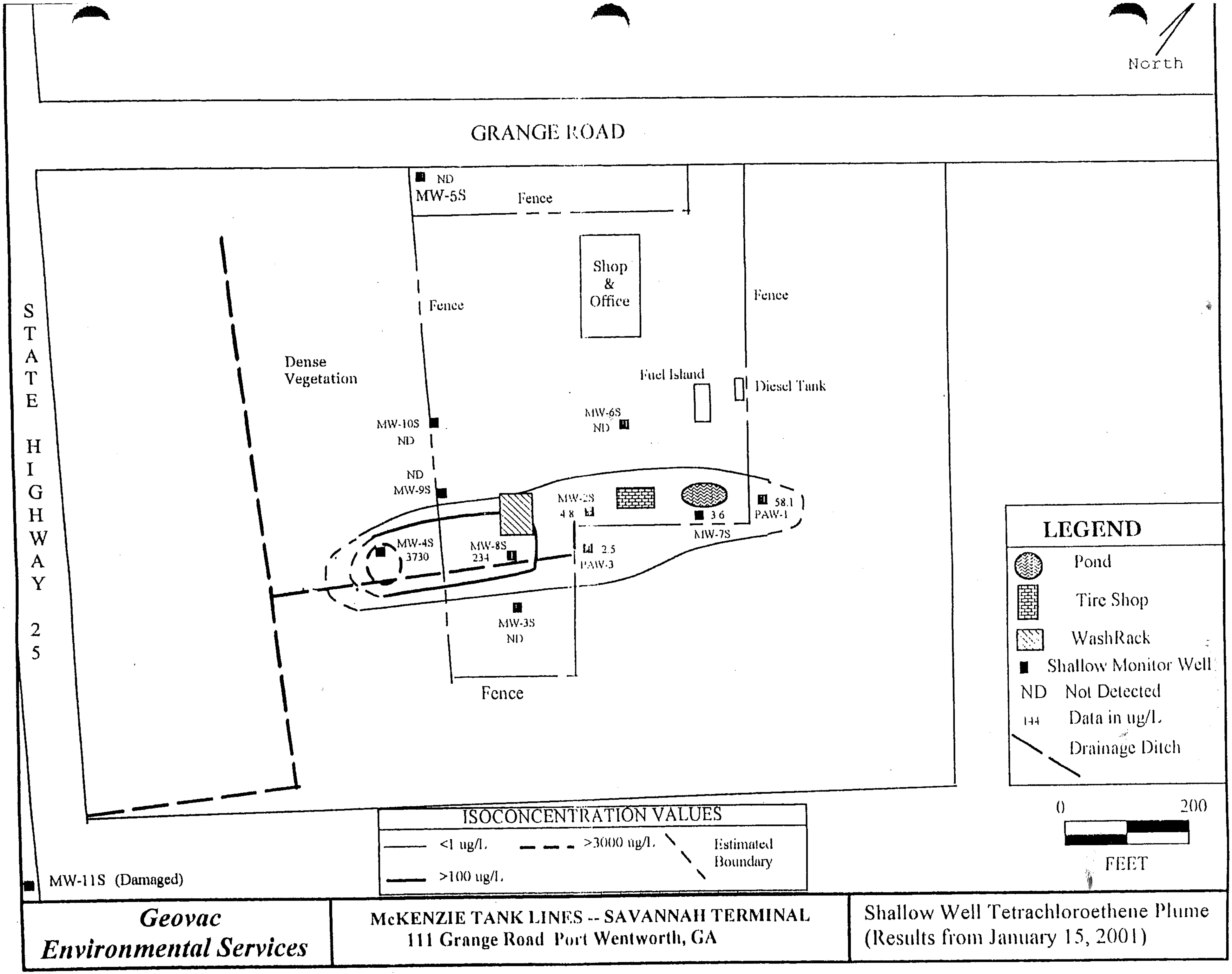

FARLEY-JONES & ASSOCIATES
DAN FARLEY, P.G.

Source: Farley-Jones, 1993

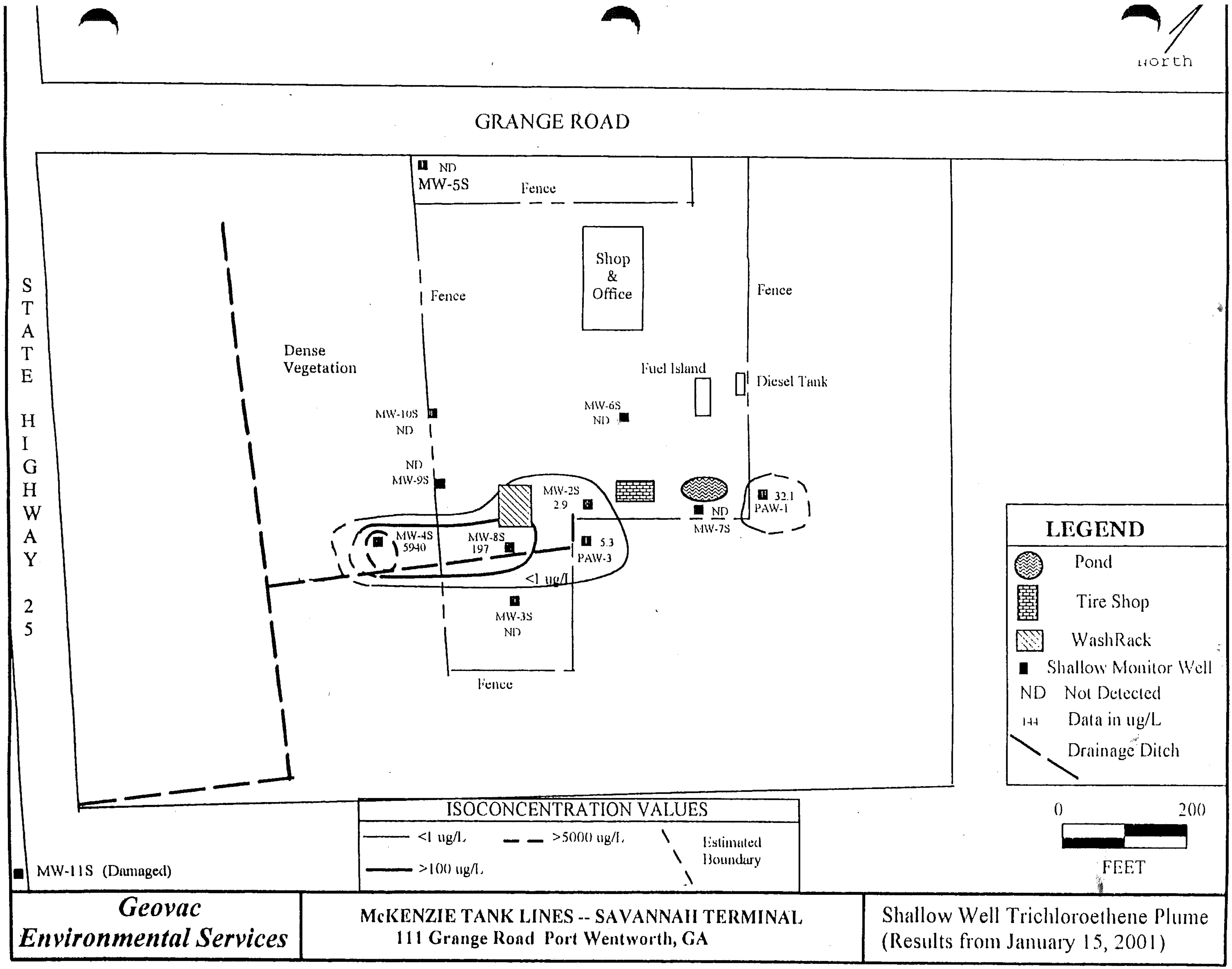
| McKENZIE TANK LINES, INC. - SAVANNAH, GA | FIGURE 5 | REGIONAL GEOLOGIC CROSS-SECTION |
|---|---|---|

# VIRP APPLICATION

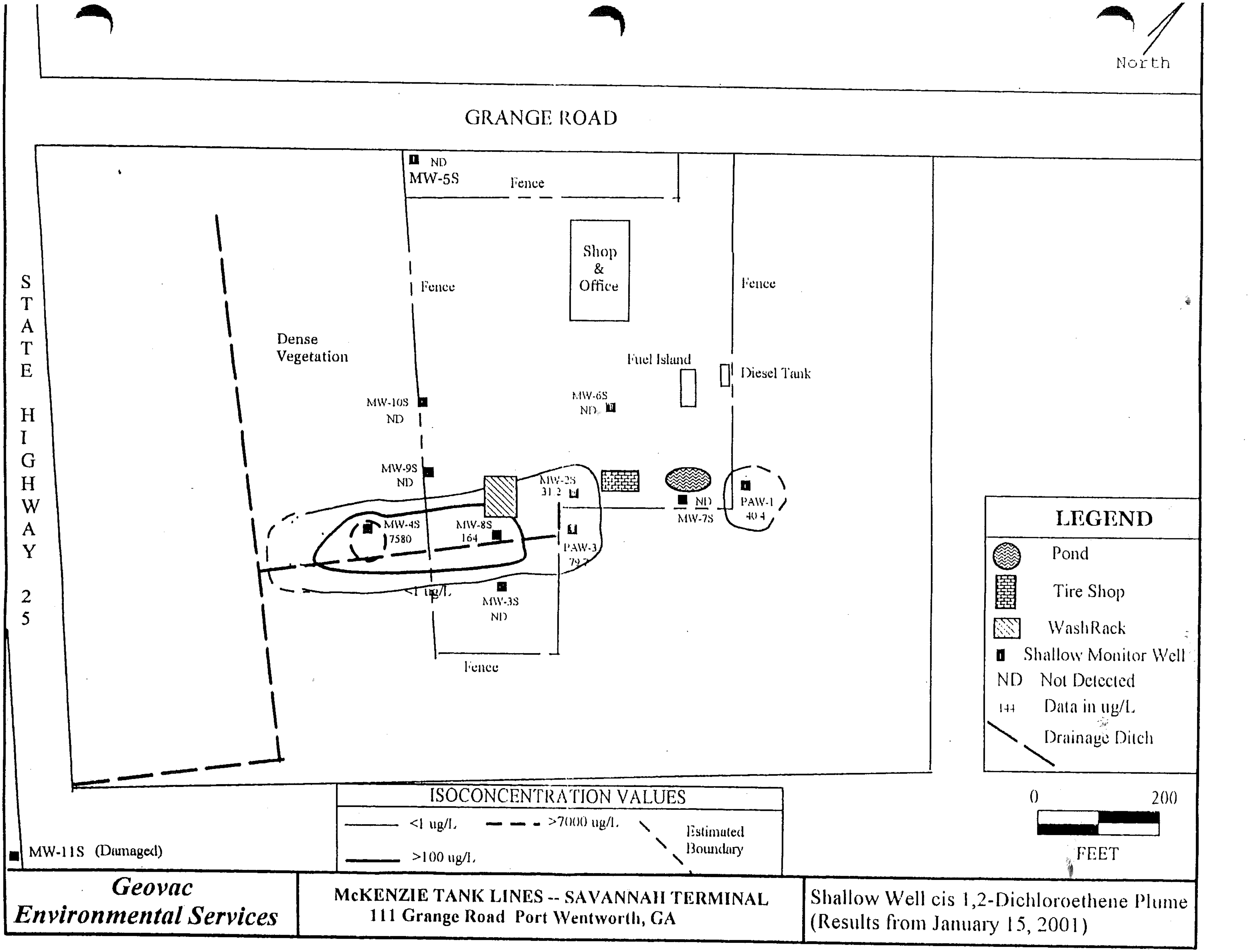
## ATTACHMENT H



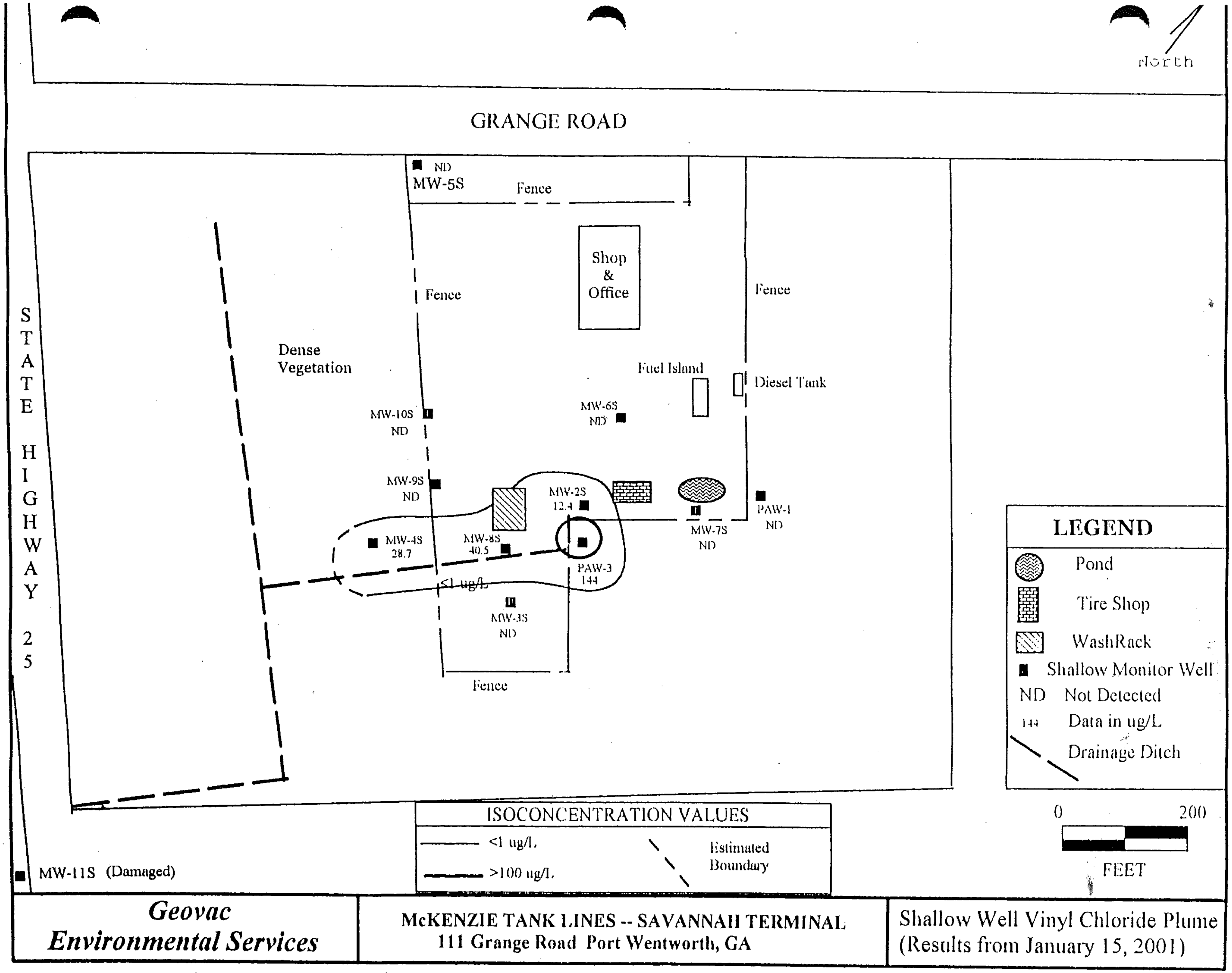

Source: SES and Geovac, 2006




Source: SES and Geovac, 2006




Source: SES and Geovac, 2006

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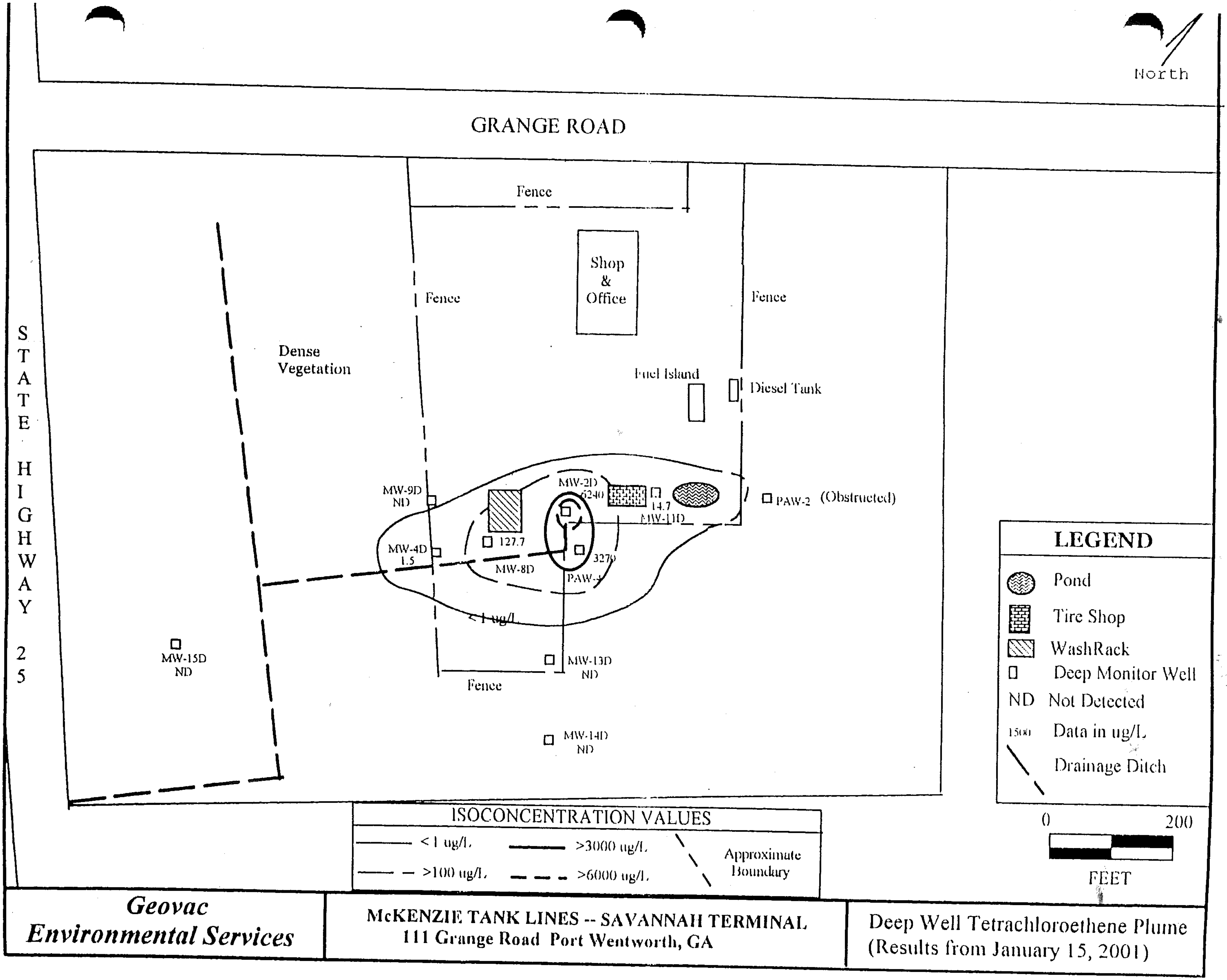
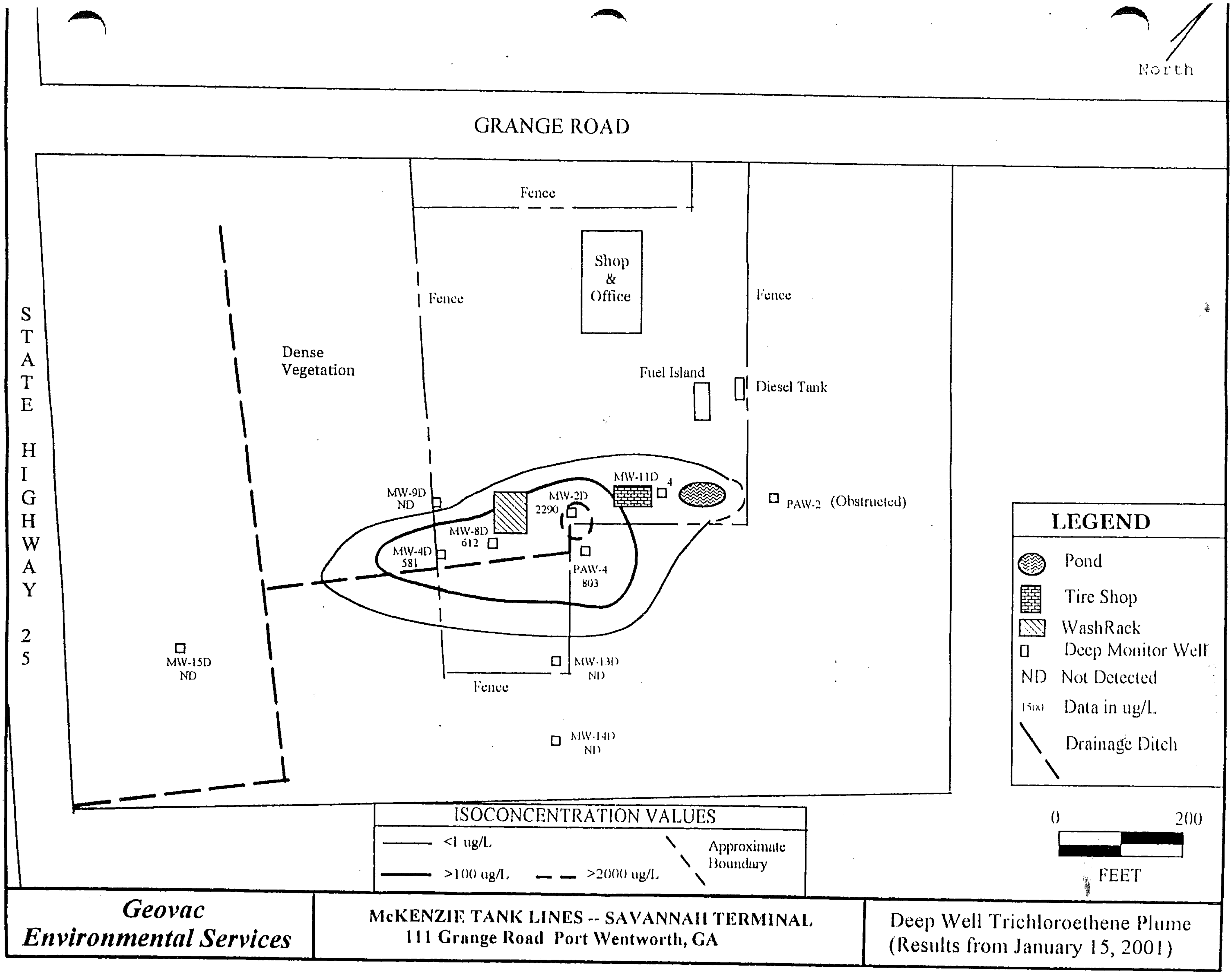
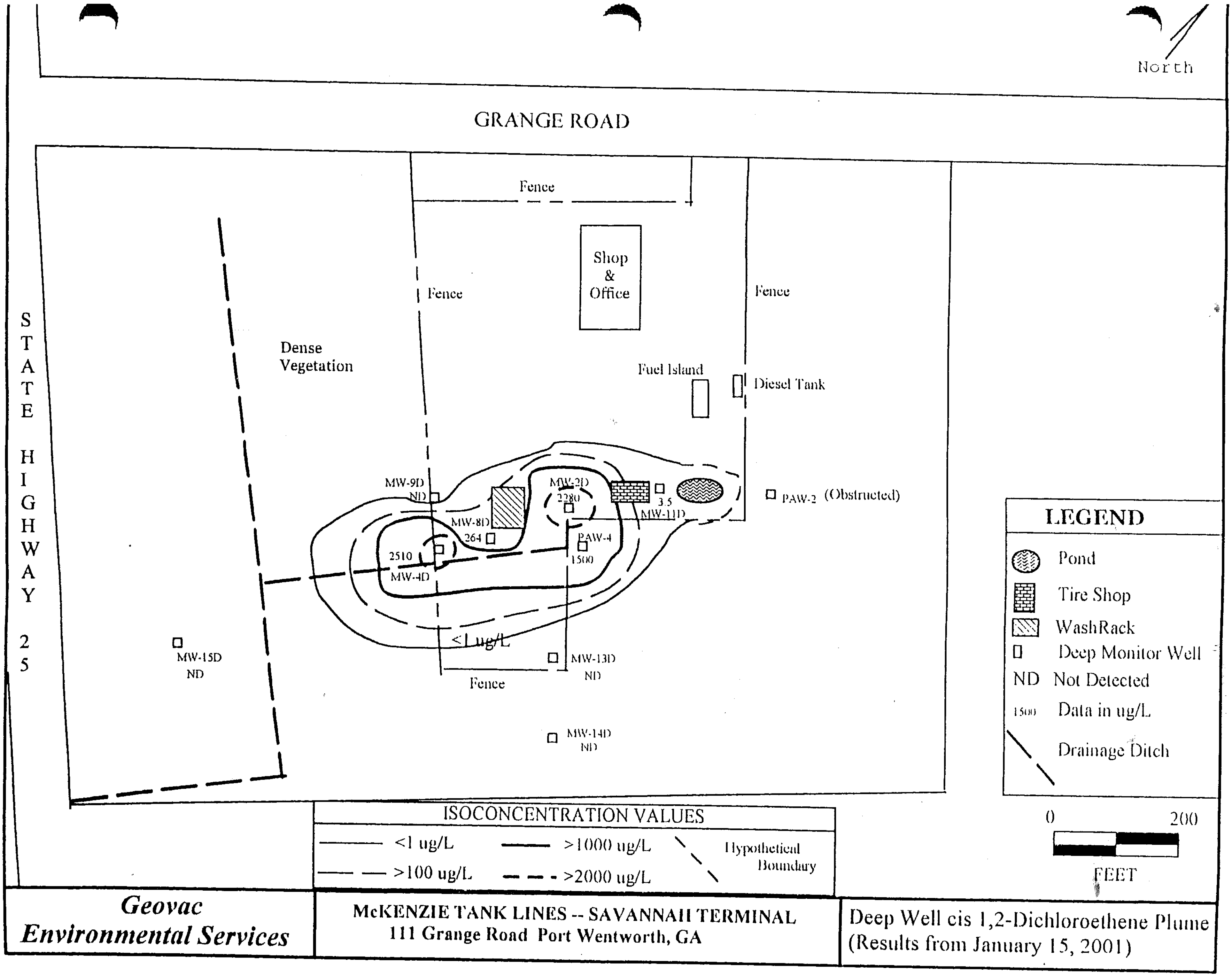


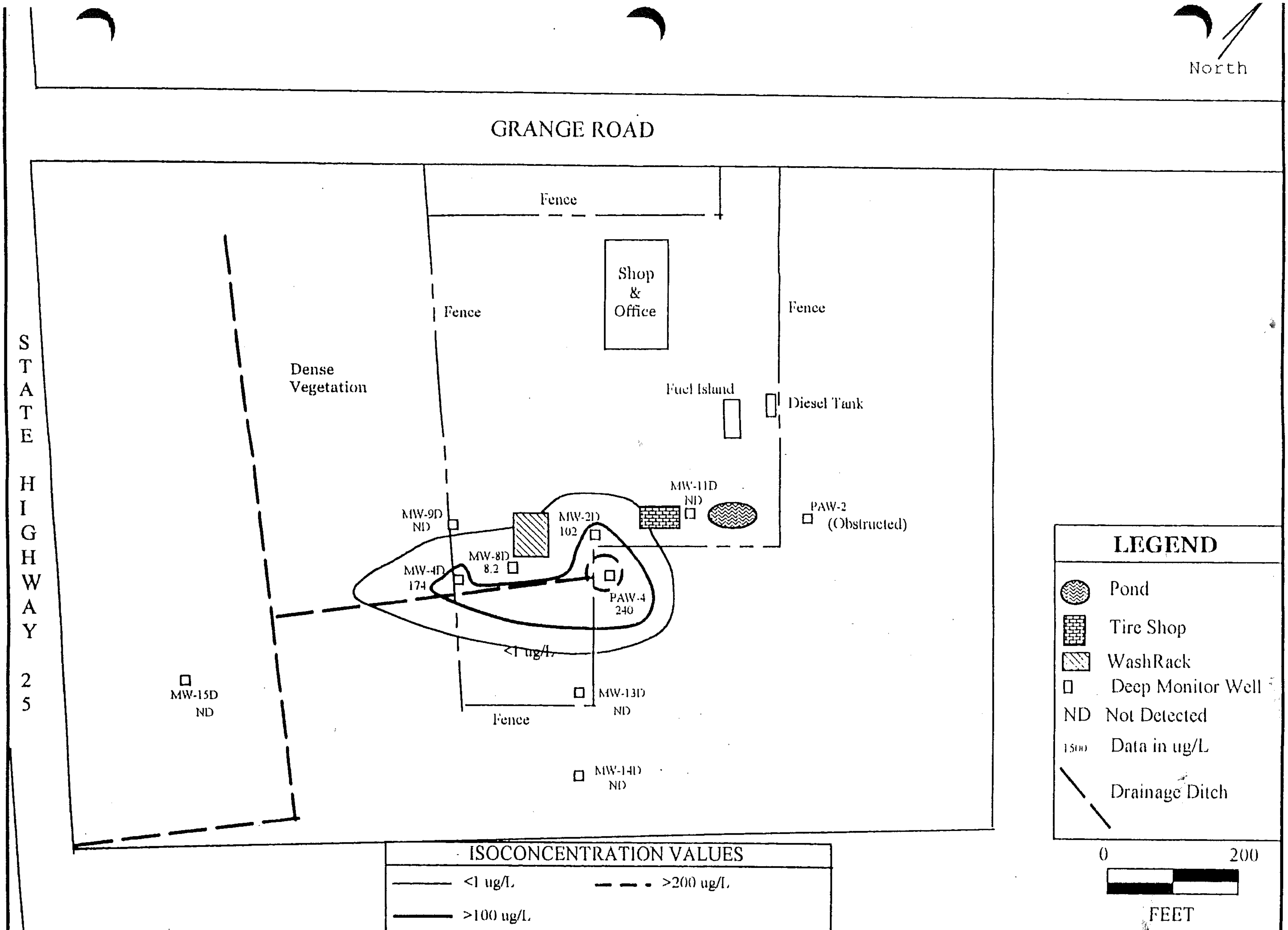

Source: SES and Geovac, 2006




Source: SES and Geovac, 2006




Source: SES and Geovac, 2006




| Geovac Environmental Services | McKENZIE TANK LINES -- SAVANNAH TERMINAL<br>111 Grange Road Port Wentworth, GA | Deep Well Vinyl Chloride Plume<br>(Results from January 15, 2001) |
|---|---|---|

Source: SES and Geovac, 2006