FINAL

CORRECTIVE ACTION PLAN
PART B
UNDERGROUND STORAGE TANK 29
FACILITY ID #: 9-089088
BUILDING 1633
FORT STEWART, GEORGIA

Prepared for:
U.S. Army Corps of Engineers
Savannah District
Under Contract Number DACA21-95-D-022
Delivery Order Number 0016

Prepared by:
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March 1999

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contributed to the preparation of this document and should not be considered an eligible contractor for its review.

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LIST OF ACRONYMS

ACL	alternate concentration limit
ATL	alternate threshold level
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, ethylbenzene, toluene, and xylenes
CAP	Corrective Action Plan
COPC	chemical of potential concern
DAF	dilution attenuation factor
DPW	Directorate of Public Works
EPA	U.S. Environmental Protection Agency
GA EPD	Georgia Environmental Protection Division
GUST	Georgia Underground Storage Tank Management Program
HQ	hazard quotient
ISC	Initial Site Characterization
IWQS	In-stream Water Quality Standard
MCL	maximum contaminant level
PAH	polyaromatic hydrocarbon
PVC	polyvinyl chloride
QC	quality control
SAIC	Science Applications International Corporation
SI	Site Investigation
TPH	total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
USCS	Unified Soil Classification System
UST	underground storage tank
VOC	volatile organic compound

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I. CORRECTIVE ACTION PLAN CERTIFICATION - PART B

(Form and certification follow this page.)

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Georgia Department of Natural Resources
Environmental Protection Division
Land Protection Branch
Underground Storage Tank Management Program
4244 International Parkway, Suite 104
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CORRECTIVE ACTION PLAN
PART B

Facility Name: Building 1633, UST 29 Site

Street Address: McFarland Avenue between Divarty Avenue and West 8th Street

City: Fort Stewart **County:** Liberty

Facility ID #: 9-089088

Submitted by UST Owner/Operator:				**Prepared by:**			
Name:	Thomas C. Fry/Environmental Branch			Name:	Patricia Stoll		
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Zip Code:	31314-4928			Zip Code:	37831		

I. PLAN CERTIFICATION:

A. UST Owner/Operator:

I hereby certify that the information contained in this plan and in all the attachments is true, accurate, and complete, and the plan satisfies all criteria and requirements of Rule 391-3-15-.09 of the Georgia Rules for Underground Storage Tank Management.

Name: Thomas C. Fry

Signature: Thomas C. Fry Date: 03/08/99

B. Professional Engineer or Professional Geologist:

Name: Patricia Stoll

Signature: Patricia A. Stoll

Date: 3/1/99

GEORGIA REGISTERED 22851 PROFESSIONAL ENGINEER P. A. STOLL

Georgia Stamp or Seal

Check all boxes below that apply. Attach supporting documentation, i.e., narrative, figures, tables, maps, boring/well logs, etc., for all items checked. Supporting documentation should be three-hole punched and prepared in conformity with the guidance document "Underground Storage Tank (UST) Release: Corrective Action Plan – Part B (CAP-B) Content," GUST-7B.

II. SITE INVESTIGATION REPORT:

A. Horizontal and Vertical Extent of Contamination:

☒ Soil (Section II.A.1)

☒ Groundwater (Section II.A.2)

☐ Free product

☐ Surface water

B. Local and Site Hydrogeology:

☒ Documentation of local groundwater conditions (Section II.B.1)

☒ Stratigraphic boring logs (Section II.B.2)

☒ Stratigraphic cross sections (Section II.B.3)

☒ Referenced or documented calculations of relevant aquifer parameters (Section II.B.4)

☒ Direction of groundwater flow (Section II.B.5):

- ☒ Table of monitoring well data (Table II-7)
- ☒ Potentiometric map (Figures II-16 and II-17)
- ☒ Flow net superimposed on a Base map (Figure II-18)

III. REMEDIAL ACTION PLAN:

A. Corrective Action Completed or In Progress:

☐ Recovery/removal of free product (nonaqueous-phase hydrocarbons)

☐ Remediation/treatment of contaminated backfill material and native soils

☒ Other (specify) Not applicable.

B. Objective of Corrective Action:

☐ Remove free product that exceeds one-eighth inch

☐ Remediate groundwater contamination that exceeds:

- ☐ Maximum contaminant levels (MCLs)

OR

- ☐ In-stream water quality standards

B. Objective of Corrective Action (continued):

☐ Remediate soil contamination that exceeds:

☐ Threshold values listed in Table A

OR

☐ Threshold values listed in Table B

OR

☐ Alternate Threshold Levels (ATLs) (reference CAP A, App. I)

☒ Provide risk-based corrective action (reference CAP B, App. I) (Section III.B.4)

☐ Remediate soil and/or groundwater contamination that exceeds alternate concentration limits (ACLs) and monitor residual contaminants

OR

☒ Monitor soil and/or groundwater contamination that exceeds levels in Rule -.09 (3) but is less than ACLs

C. Design and Operation of Corrective Action Systems:

☐ Soil ☐ Groundwater ☐ Free product ☐ Surface water ☒ Not applicable

D. Implementation (Section III.D):

Includes, as a minimum, the following:

- Milestone schedule for site remediation
- Inspection and preventive maintenance schedule for all specialized remediation equipment
- Monitoring/sampling and reporting plan for measuring interim progress and project completion
- Plan to decommission equipment/wells and close site

IV. PUBLIC NOTICE

☐ Certified letters to adjacent, and potentially affected, property owners and local officials

☒ Legal notice in newspaper, as approved by EPD (Section III.E)

☐ Other EPD-approved method (specify)_____

V. **CLAIM FOR REIMBURSEMENT** (For GUST Trust Fund sites only) :

- ☐ GUST Trust Fund Application (GUST-36) must be attached, if applicable
- ☐ Cost proposal
  - ☐ Non-reimbursable costs

    OR
  - ☐ Reimbursable costs
    - ☐ Total project costs
      - ☐ Costs incurred to date, per GUST-92
      - ☐ Estimated costs to complete corrective action, per GUST-92
    - ☐ Invoices and proofs of payment for costs incurred to date
- ☐ Proposed schedule for reimbursement
  - ☐ Lump sum payment upon completion of corrective action

    OR
  - ☐ Interim payments with final payment upon completion
- ☒ Not applicable

II. SITE INVESTIGATION REPORT

This document represents the Site Investigation (SI) Report for the former underground storage tank (UST) 29, Facility ID No. 9-089088, located near Building 1633 at Fort Stewart, Georgia. The UST 29 site is located in the 3d BN 69th Armor Motorpool on McFarland Avenue between Divarty Avenue and West 8th Street, as illustrated in Figure II-1. The UST 29 site is located within an average or higher groundwater pollution susceptibility area and is more than 500 feet from a withdrawal point. According to operational information maintained by the Fort Stewart Directorate of Public Works (DPW), UST 29 had a capacity of 1,000 gallons and was used for the storage of waste oil. The tank was constructed of fiberglass-reinforced plastic, and the associated piping was galvanized steel. The tank and piping were installed on or about January 1, 1982, and the system was last used in April 1995. The tank was excavated and removed on October 25, 1995. The piping was closed in place because of the overlying 10 to 12 inches of high-strength concrete. Benzene, toluene, ethylbenzene, and xylenes (BTEX) were not present at concentrations exceeding the applicable Georgia Underground Storage Tank Management Program (GUST) soil threshold levels during UST removal and excavation activities (Anderson Columbia 1995). However, elevated concentrations of total petroleum hydrocarbons (TPH) were observed in the soil from the tank pit.

Anderson Columbia Environmental, Inc. (Anderson Columbia) performed the Initial Site Characterization (ISC) in October 1995. Following the ISC, the Corrective Action Plan (CAP) Part A SI was conducted and consisted of the installation of six soil borings for soil and groundwater sampling. Science Applications International Corporation (SAIC) performed the Part A SI in September and December 1996. The CAP Part A Report (SAIC 1997) describing the results of the ISC and the Part A SI was submitted to the Georgia Environmental Protection Division (GA EPD) GUST in May 1997. A CAP Part B SI was determined to be necessary to define the extent of identified soil and groundwater contamination and to collect additional hydrologic and geologic information. The Part B SI consisted of the installation of one soil boring and five groundwater monitoring wells for soil and groundwater sampling. The SI Plan provided with the CAP Part A Report described the technical approach for the SI and was approved by GA EPD in correspondence dated July 30, 1997 (White 1997). This SI Report presents the findings of the CAP Part B investigation.

The CAP Part B for UST 29 was performed for Fort Stewart DPW, Environmental Branch, through the U.S. Army Corps of Engineers (USACE), Savannah District, by SAIC in November 1997 and November 1998, under contract DACA21-95-D-022, delivery order 0016.

II.A. HORIZONTAL AND VERTICAL EXTENT OF CONTAMINATION

The horizontal and vertical extent of petroleum contamination in soil and groundwater has been delineated by activities performed during the ISC, Part A SI, and Part B SI. The ISC consisted of tank removal and collection of two soil samples from the tank pit bottom that were subsequently analyzed for BTEX and TPH. The Part A SI consisted of the following investigative activities: drilling six soil borings with PowerPunch; collecting soil samples for BTEX, polyaromatic hydrocarbons (PAHs), TPH, and volatile organic compound (VOC) headspace analyses; collecting groundwater samples for BTEX and PAH analyses; installing piezometers for water level measurement and detection of free product; and conducting a survey of public and nonpublic drinking water supplies within 2.0- and 0.5-mile radii of the site.

The Part B SI was performed in accordance with the technical approach described in the SI Plan and the requirements of the Work Plan for Preliminary Groundwater and Corrective Action Plan Part A/Part B Investigations at Former Underground Storage Tank Sites, Fort Stewart, Georgia (SAIC 1996). The Part B SI field activities included drilling five monitoring well borings for soil and groundwater sampling and one soil boring for soil sampling, water level measurement, and slug testing; collecting soil samples from monitoring wells for BTEX, PAH, TPH, VOC headspace, and geotechnical analyses; collecting groundwater samples for

BTEX and PAH analyses; performing one rising head slug test, and collecting a comprehensive round of site water level measurements. The monitoring well in the area of the highest contamination was drilled deeper to determine the vertical extent of groundwater contamination through soil sampling. The vertical-profile boring (14-08) was drilled to 15.0 feet below ground surface (bgs) and was screened across the water table at 3.0 to 13.0 feet bgs. The Part B SI analytical laboratory results are included as Appendix A of this document.

II.A.1. Delineation of Soil Contamination

Petroleum-related contaminants detected in soil at the UST 29 site during the ISC, Part A SI, and Part B SI included BTEX and naphthalene. These constituents were present in 17 of the 24 soil samples collected during the Part A and Part B SIs. The constituents were present in the boreholes surrounding the tank pit. The concentrations of benzene exceeded applicable UST Corrective Action Soil Thresholds Levels (i.e., Table A, Column 2).

II.A.1.a. Contaminant concentrations

II.A.1.a.1. Initial Site Characterization

During the ISC, two soil samples were collected from the tank pit excavation. Soil analytical data from the tank removal sampling indicated that the soil from the tank pit contained elevated TPH concentrations. None of the BTEX compounds exceeded the applicable soil threshold levels (i.e., Table A, Column 2).

II.A.1.a.2. Part A Site Investigation

During the Part A SI, 12 soil samples were collected for geochemical analysis from the six soil borings shown in Figure II-2. The analytical results are presented in Table II-1, and the sample locations are shown in Figure II-3. These borings ranged in depth from 8.0 to 20.0 feet bgs. Site restrictions prevented the drilling of a soil boring within the tank pit. In September 1996, four soil borings (14-01, 14-02, 14-03, and 14-04) were located around the perimeter of the tank pit. Field screening methods were used during drilling to select soil samples for geochemical analysis. In December 1996, two additional borings (14-05 and 14-06) were drilled to delineate the extent of contamination found in boring 14-03 in September 1996.

Ten of the 12 soil samples collected had detectable levels of BTEX constituents. Benzene concentrations ranged from 0.0059J to 0.0304J mg/kg, ethylbenzene concentrations ranged from 0.0111J to 0.155J mg/kg, toluene concentrations ranged from 0.0062 to 0.027 mg/kg, and total xylenes concentrations ranged from 0.0139J to 0.309J mg/kg. Naphthalene was detected in three soil samples at concentrations ranging from 0.359J to 0.775 mg/kg. The analytical results for soil sampling are presented in the plan view in Figure II-4, and the results exceeding applicable GUST Soil Threshold Levels (i.e., Table A, Column 2) are presented in the cross sections in Figure II-4. Benzene concentrations exceeded applicable GUST Soil Threshold Levels. However, the concentrations detected for all contaminants were well below risk-based screening levels for these compounds. Concentrations in the remaining soil samples were below the analytical detection limits achieved during the Part A SI. The detection limits for soil sample analyses during the Part A SI were 0.0054 to 0.0068 mg/kg for BTEX constituents and 0.357 to 0.445 mg/kg for PAH constituents.

II.A.1.a.3. Part B Site Investigation

During the Part B SI, 12 soil samples were collected for geochemical analysis from the six borings shown in Figure II-2. The analytical results are presented in Table II-2, and the sample locations are shown in Figure II-3. These samples were collected in accordance with the technical approach presented in the SI Plan of the CAP Part A Report, which was approved by GA EPD in correspondence dated July 23, 1997 (White 1997). The Part B SI soil borings ranged in depth from 12.0 to 20.0 feet bgs. Five of the six soil borings were converted to monitoring wells: two (14-07 and 14-09) bordering the area of the highest Part A contamination, one (14-08) in the vicinity of the highest Part A SI contamination to delineate the vertical extent of the contamination, and two (14-11 and 14-12) downgradient of the area of highest contamination. A soil boring (14-10) was located upgradient. Other than boring 14-08 (vertical profile), soil samples were not collected from below the water table for geochemical analysis. Field screening methods were used during drilling to select soil samples from borings 14-07 through 14-12 for geochemical analysis. Sample intervals in boring 14-08 were targeted below the water table to delineate the vertical extent of the contamination.

Six of the 12 soil samples collected during the Part B SI had detectable levels of BTEX constituents. Ethylbenzene concentrations ranged from 0.00055J to 0.463J mg/kg, toluene concentrations ranged from 0.0010J to 0.0037J mg/kg, and total xylenes concentrations ranged from 0.00061J to 1.18J mg/kg. The benzene detection limit (0.0575 mg/kg) was elevated. Naphthalene was detected in two soil samples at concentrations of 0.0152J mg/kg and 1.46 mg/kg. The analytical results are shown in plan view in Figure II-4 and in cross section in Figure II-4. None of the contaminants, except for benzene with its elevated detection limit, exceeded the applicable GUST Soil Threshold Levels (i.e., Table A, Column 2), and no contaminants or detection levels exceeded risk-based screening levels for these compounds (see Section III of this document).

The remaining soil samples were below the analytical detection limits achieved during the Part B SI. The detection limits for soil samples during the Part B SI ranged from 0.0021 to 0.0029 mg/kg for BTEX constituents and from 0.0925 to 0.468 mg/kg for PAH constituents.

II.A.1.b. Field screening results

Field screening through VOC headspace was performed during drilling for soil collected during the Part A SI and Part B SI. For each 5-foot interval drilled, two 2.5-foot soil grab samples were collected into glass jars and covered with aluminum foil. These samples corresponded to potential analytical sample aliquots collected from the same interval. After allowing at least 15 minutes for volatilization and temperature equilibration, the headspace VOC concentration was measured with a photoionization detector to quantify the VOCs present. Table II-3 presents the field screening results for the Part A SI and Part B SI. In cases in which no contamination was detected in any of the borehole intervals by field headspace gas analysis, two soil samples were sent for chemical analyses: one from the interval nearest to the midpoint between the ground surface and the water table and one from the interval above the water table. In cases in which contamination was detected in one or more of the borehole intervals by field headspace gas analysis, two soil samples were sent for chemical analyses: one from the interval with the highest detected organic vapor concentration and one from the interval with the lowest detected organic vapor concentration.

II.A.2. Delineation of Groundwater Contamination

Petroleum-related contaminants detected in groundwater at the UST 29 site during the ISC, Part A SI, and Part B SI included BTEX and naphthalene. These constituents were present in 7 of the 11 groundwater samples collected during the Part A and Part B SIs. Three samples exceeded federal maximum contaminant levels (MCLs) for benzene. Other constituents detected were all below applicable regulatory threshold values. Risk-based concentration values for BTEX and PAH constituents and an alternate concentration limit (ACL)

for benzene based on fate and transport modeling results were developed for the UST 29 site Remedial Action Plan (see Section III of this document).

II.A.2.a. Horizontal extent of groundwater contamination

II.A.2.a.1. Initial Site Characterization

During the ISC, no groundwater samples were collected from the tank pit during removal of the UST.

II.A.2.a.2. Part A Site Investigation

During the Part A SI, six groundwater samples were collected for geochemical analysis from six PowerPunch, groundwater sampling points as presented in Table II-4. The PowerPunch groundwater sampling points (14-01 through 14-06) penetrated approximately 3 feet below the water table. Sampling point 14-01 was located east of the tank pit, 14-02 was located to the west of the tank pit, 14-03 was located north of the tank pit, and 14-04 was located to the south of the tank pit. Borings 14-05 and 14-06 were located northwest and northeast, respectively, of 14-03.

Benzene was identified above analytical reporting limits in one groundwater sample during the Part A SI. Two samples contained estimated values below the reporting limit. Samples 1402W2, 1403W2, and 1406W2 contained 2.8J µg/L, 238 µg/L, and 2.4J µg/L of benzene, respectively, as illustrated in plan view and cross section on Figure II-5. The concentration in 1403W2 was above the federal MCL of 5 µg/L and the state In-Stream Water Quality Standard (IWQS) of 71.28 µg/L. All three detected concentrations exceeded the risk-based screening level of 0.36 µg/L. However, the concentrations did not exceed the site ACL for benzene of 550 µg/L. The analytical detection limit for benzene was 5 µg/L in all samples.

Ethylbenzene was identified above the analytical reporting limit in one groundwater sample during the Part A SI. Three samples contained estimated values below the reporting limit. Samples 1402W2, 1403W2, 1405W2, and 1406W2 contained 0.17J µg/L, 71.4 µg/L, 0.098J µg/L, and 0.53J µg/L of ethylbenzene, respectively, as illustrated in plan view and cross section on Figure II-6. These concentrations were below the federal MCL of 700 µg/L, below the state IWQS of 28, 718 µg/L, and below the risk-based screening level of 1,300 µg/L.

Toluene was identified above the analytical detection limit in one groundwater sample during the Part A SI. Sample 1403W2 contained 6 µg/L of toluene, as illustrated in plan view and cross section on Figure II-7. The concentration was below the federal MCL of 1,000 µg/L, below the state IWQS of 200,000 µg/L, and below the risk-based screening level of 750 µg/L.

Total xylenes were identified above analytical reporting limits in one groundwater sample during the Part A SI. Two samples contained estimated values below the reporting limit. Samples 1402W2, 1403W2, and 1405W2 contained 2.4J µg/L, 180 µg/L, and 4.6J µg/L of total xylenes, respectively, as illustrated in plan view and cross section on Figure II-8. These concentrations were below the federal MCL of 10,000 µg/L and below the risk-based screening level of 12,000 µg/L. This compound does not have a state IWQS.

Naphthalene was identified above analytical detection limits in one groundwater sample during the Part A SI. Sample 1403W2 contained 51.2 µg/L of naphthalene, as illustrated in plan view and cross section on Figure II-9. This compound does not have a federal MCL or state IWQS; however, the concentration in 1403W2 did not exceed the risk-based screening level of 1,500 µg/L. The analytical detection limit for naphthalene was 10 µg/L.

II.A.2.a.3. Part B Site Investigation

During the Part B SI, five groundwater samples were collected for geochemical analysis from five groundwater monitoring wells, as shown in Table II-5. The groundwater monitoring wells (14-07, 14-08, 14-09, 14-11, and 14-12) were drilled between 12.0 and 20.0 feet bgs. Monitoring wells 14-07 and 14-09 were located around the area of highest Part A contamination and underground utilities, monitoring well 14-08 was located in the area of highest contamination, and monitoring wells 14-11 and 14-12 were located downgradient of the area of contamination. Monitoring well and soil boring locations are shown in Figure II-2.

Benzene was identified above analytical detection limits in two groundwater samples during the Part B SI. One sample contained an estimated value below the reporting limit. Samples 1408W2, 1409W2, and 141122 contained 238 µg/L, 12.8 µg/L, and 4.5J µg/L of benzene, respectively, as illustrated in plan view and cross section on Figure II-10. The benzene concentrations in 1408W2 and 1409W2 were above the federal MCL of 5 µg/L, and all three concentrations were above the risk-based screening level of 0.36 µg/L. The concentration of 1408W2 exceeded the state IWQS of 71.28 µg/L. However, the concentrations did not exceed the site ACL for benzene of 550 µg/L. The analytical detection limit for benzene was 2 µg/L.

Ethylbenzene was identified above analytical detection limits in one groundwater sample during the Part B SI. Sample 1408W2 contained 179 µg/L of ethylbenzene, as illustrated in plan view and cross section on Figure II-11. The concentration was below the federal MCL of 700 µg/L, (below the state IWQS of 28,718 µg/L) and below the risk-based screening level of 1,300 µg/L. The analytical detection limits for ethylbenzene were 2 and 5 µg/L.

Toluene was not identified above analytical detection limits in any groundwater sample during the Part B SI. However, sample 1408W2 contained an elevated detection limit of 20 µg/L, and sample 141122 had an estimated concentration of 0.52 µg/L, as illustrated in plan view and cross section on Figure II-12. The detection limits were below the federal MCL of 1,000 µg/L, below the state IWQS of 200,000 µg/L, and below the risk-based screening level of 750 µg/L. The analytical detection limit for toluene was 2 µg/L, except for sample 1408W2.

Total xylenes were identified above analytical detection limits in two groundwater samples during the Part B SI. One sample contained an estimated value below the reporting limit. Samples 1408W2, 1409W2, and 141122 contained 295 µg/L, 7.1 µg/L, and 0.52J µg/L of total xylenes, respectively, as illustrated in plan view and cross section on Figure II-13. The concentrations were below the federal MCL of 10,000 µg/L and below the risk-based screening level of 12,000 µg/L. This compound does not have a state IWQS. The analytical detection limit for total xylenes was 4 µg/L.

Naphthalene was identified above analytical detection limits in two groundwater samples during the Part B SI. Samples 1408W2 and 141212 contained 67.1 µg/L and 13 µg/L of naphthalene, respectively, as illustrated in plan view and cross section on Figure II-14. This compound does not have a federal MCL or state IWQS, but the concentrations were below the risk-based screening level of 1,500 µg/L.

II.A.2.a.4. Conclusions of the Horizontal Extent of Site Groundwater Contamination

Figures II-5 through II-14 show that the horizontal extent of petroleum contaminants in groundwater has been delineated to the respective regulatory levels and analytical detection limits. The horizontal extent of these constituents has been estimated based on nearby concentrations and on the distribution of similar contaminants. Petroleum contaminants identified in groundwater at the UST 29 site include BTEX constituents normally associated with waste oil releases as well as PAH constituents, which probably represent less soluble biodegradation products of the release. The UST 29 site is a likely candidate for natural attenuation because

the source of the contamination has been removed and the size of the plume has not expanded to the outer perimeter of monitoring wells installed at the site. There is no groundwater contamination above MCLs in wells 14-11 and 14-12, located approximately 50 feet and 120 feet, respectively, downgradient from the area of highest contamination, indicating that the residual contamination is being degraded before it reaches the downgradient wells. However, the benzene contamination in 14-11 is 4.5J µg/L, which is just below the federal MCL, so two additional monitoring wells will be installed downgradient to confirm the horizontal delineation. The site's groundwater flow and geology are conducive to aerobic biodegradation, which is known to produce the most rapid biodegradation rates for hydrocarbons.

As indicated in Figures II-5 to II-14, the area of highest groundwater contamination is located approximately 50 feet northeast of the former tank pit, indicating some uncertainty as to the source of contamination. The contamination identified at the UST 29 site may be associated with the gasoline and diesel dispenser island that is located to the northeast of the former tank pit, which was part of the USTs 30–32 site, Facility ID #9-089114. Regardless of the source of contamination, the plume has been fully delineated and will be tracked as a release from UST 29.

II.A.2.b. Vertical extent of groundwater contamination

The vertical extent of groundwater contamination was not investigated during the ISC or Part A SI. During the Part B SI, the vertical extent of groundwater was delineated through soil sampling below the water table in accordance with GUST technical direction. Soil boring 14-08 was advanced below the water table, and soil samples were collected from 1.0 to 2.5 feet and 10.0 to 12.5 feet bgs. Drilling was stopped after several 2.5-foot sample intervals contained headspace readings of zero. The Hawthorn Formation was not encountered during drilling of 14-08 but is believed to be located within 20 to 30 feet of the bottom of this boring. Because the 10.0- to 12.5-foot sample interval did not indicate the presence of BTEX or PAH constituents above the applicable soil threshold levels, the vertical extent of groundwater contamination has been determined and is limited to the surficial aquifer (i.e., less than 10 feet bgs).

II.A.3. Delineation of Free Product Plume

No free product was identified at the UST 29 site during the ISC, Part A SI, or Part B SI.

II.A.4. Delineation of Surface Water Contamination

No surface water contamination has been identified or reported in association with the UST 29 site. The nearest surface water body, which is a potential groundwater discharge receptor, is a drainage ditch located approximately 500 feet west of the site (Figure II-15). Due to the distance to the surface water body, the absence of any known impact, and the potential for other sources of petroleum contamination within the watershed, no surface water sampling has been conducted.

II.B. LOCAL AND SITE HYDROGEOLOGY

Discussion of the local and site hydrogeology is based on field observations and investigative activities performed during the ISC, Part A SI, and Part B SI of the UST 29 site.

II.B.1. Documentation of Local Groundwater Conditions

II.B.1.a. Groundwater usage

According to the Groundwater Pollution Susceptibility Map of Georgia (GA EPD 1992), UST 29 site, Facility ID #: 9-089088, is located within an average or higher groundwater pollution susceptibility area. A total of

seven groundwater supply wells are located within a 2-mile radius of the Fort Stewart garrison area, with six of these wells being located within the confines of the garrison area. The other well is located at Wright Army Airfield, approximately 1.2 miles northeast of the garrison area. All of the groundwater supply wells are classified as public wells that supply water to Fort Stewart for drinking and nondrinking purposes. These wells are approximately 450 feet deep and draw groundwater from the Principal Artesian (also known as the Floridan) aquifer. Chlorine and fluoride are added to the groundwater at the well heads prior to its being pumped into storage tanks and/or water towers, according to Fort Stewart DPW personnel. The locations of these wells, and a 500-foot radius drawn around each well, are shown on Figure II-15. Based on the location of UST 29 site, Facility ID #: 9-089088, relative to the identified groundwater supply wells, this site is classified as being located more than 500 feet from a withdrawal point.

II.B.1.b. Aquifer description

The hydrogeology in the vicinity of Fort Stewart is dominated by two aquifers referred to as the Principal Artesian and the surficial aquifers. The Principal Artesian aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer is composed primarily of Tertiary-age limestone, including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. These formations are approximately 800 feet thick, and groundwater from this aquifer is primarily used for drinking water (Arora 1984).

The uppermost hydrologic unit is the surficial aquifer, which consists of widely varying amounts of sand and clay ranging from 55 to 150 feet in thickness. This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 feet bgs (Geraghty & Miller 1993). The base of the aquifer corresponds to the top of the underlying dense clay of the Hawthorn Group. The Hawthorn Group was not encountered during drilling at this site but is believed to be located at 40 to 50 feet bgs; therefore, the effective aquifer thickness would be approximately 35 to 45 feet. Soil surveys for Liberty and Long counties describe the occurrence of a perched water table within the Stilson loamy sands present within Fort Stewart (Looper 1980).

The confining layer for the Principal Artesian aquifer is the phosphatic clay of the Hawthorn Group and ranges in thickness from 15 to 90 feet. The vertical hydraulic conductivity of this confining unit is on the order of 10^{-8} cm/sec. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Hawthorn Group has been divided into three formations: the Cooswhatchie Formation, the Markshead Formation, and the Parachula Formation, listed from youngest to oldest.

The Coosawhatchie Formation is composed predominantly of clay but also has sandy clay, argillaceous sand, and phosphorite units. The formation is approximately 170 feet thick in the Savannah, Georgia, area. This unit disconformably overlies the Markshead Formation and is distinguished from the underlying unit by dark phosphatic clays or phosphorite in the lower part and by fine-grained sand in the upper part.

The Markshead Formation is approximately 70 feet thick in the Savannah, Georgia, area and consists of light-colored phosphatic, slightly dolomitic, argillaceous sand to fine-grained sandy clay with scattered beds of dolostone, and limestone.

The Parachula Formation consists of sand, clay, limestone, and dolomite and is approximately 10 feet thick in the Savannah, Georgia, area. The Parachula Formation generally overlies the Suwannee Limestone in Georgia.

Field geochemical parameters measured during the Part B SI reflect typical acidic (pH ranging from 5.80 to 6.23) groundwater conditions found in shallow groundwater in the southeast. Conductivity values at the site were low, ranging from 0.325 to 0.555 µmohs/cm.

II.B.1.c. Surface water

Several surface water bodies are located within a 1-mile radius of the Fort Stewart garrison area. These water bodies are shown on Figure II-15 and include Mill Creek, Taylors Creek, Peacock Creek, Childpen's Pond, and two unnamed ponds. Mill Creek extends along the western side of the garrison area and flows into Taylors Creek, located approximately 0.75 mile northwest of the garrison area. Taylors Creek then flows northward approximately 3.5 miles to its confluence with Canoochee Creek. Peacock Creek originates near the eastern corner of the garrison area and flows southward from the garrison. Mill Creek, Taylors Creek, and Peacock Creek all have natural streambeds and exhibit perennial flow.

Childpen's Pond is located at the northwestern end of the garrison area. The two unnamed ponds are located at the northwestern end of the facility golf course in the vicinity of Childpen's Pond. All of the ponds are isolated water bodies that are relatively small in size, measuring fewer than 500 feet in diameter. Based on the surface water features discussed, the UST 29 site, Facility ID #: 9-089088, is classified as being located more than 500 feet from a surface water body.

Runoff from the UST 29 site moves over the existing concrete and asphalt cover to the Fort Stewart storm drainage system. Because petroleum contamination at the site primarily impacts groundwater, the surface water runoff pathway is not a viable contaminant transport mechanism. The concrete acts as a barrier and the nearest surface water body that is a potential groundwater discharge receptor is a drainage ditch located approximately 500 feet west of the site.

There are numerous underground utilities at the site that could act as potential preferential pathways for contaminant migration. Upgradient of the site, to the southeast and southwest of the former tank pit, there is underground piping that carries waste oil from the grease racks to the oil/water separator and piping associated with the industrial wastewater plant. Downgradient of the site, to the northwest, is a catch basin for the storm drain system. The depth of the catch basin is approximately 2.0 feet bgs, which is above the water table. Also, the groundwater plume has not migrated as far as the catch basin.

II.B.2. Stratigraphic Boring Logs

The local stratigraphy of Fort Stewart and vicinity is presented in Section II.B.2.a, and the site stratigraphy from the Part A and Part B SIs is presented in Section II.B.2.b.

II.B.2.a. Local stratigraphy

Fort Stewart is located within the coastal plain physiographic province. This province is typified by nine southeastward-dipping strata that increase in thickness from 0 feet at the fall line, located approximately 350 miles inland from the Atlantic coast, to approximately 4,200 feet at the coast. State geologic records describe a probable petroleum exploration well (the No. 1 Jelks-Rogers) located in the region as having encountered crystalline basement rocks at a depth of 4,254 feet bgs. This well provides the most complete record for Cretaceous, Tertiary, and Quaternary sedimentary strata in the region.

The Cretaceous section was found to be approximately 1,970 feet thick and dominated by clastics. The Tertiary section was found to be approximately 2,170 feet thick and dominated by limestone with a 175-foot thick cap of dark green phosphatic clay. This clay is regionally extensive and is known as the Hawthorn Group. The

interval from approximately 110 feet to the surface is Quaternary in age and composed primarily of sand with interbeds of clay or silt. This section is undifferentiated into separate formations (Metcalf & Eddy 1996).

State geologic records contain information regarding a well drilled in October 1942, 1.8 miles north of Flemington at Liberty Field of Camp Stewart (now known as Fort Stewart). This well is believed to have been an artesian well located approximately one-quarter mile north of the runway at Wright Army Airfield within the Fort Stewart Military Reservation. The log for this well describes a 410-foot section, the lowermost 110 feet of which consisted predominantly of limestone sediments, above which 245 feet of dark green phosphatic clay typical of the Hawthorn Group was encountered. The uppermost portion of the section was found to be Quaternary-age interbedded sands and clays. The top 15 feet of these sediments were described as sandy clay (Metcalf & Eddy 1996).

The surface soil located throughout the Fort Stewart garrison area consists of Stilson loamy sand. The surface layer of this soil is typically dark grayish-brown loamy sand measuring approximately 6 inches in depth. The surface layer is underlain by material consisting of pale yellow loamy sand and extends to a depth of approximately 29 inches. The subsoil is predominantly sandy clay loam and extends to a depth of 72 inches or more (Metcalf & Eddy 1996).

II.B.2.b. Site stratigraphy

As determined from soil borings drilled during the Part A SI and Part B SI, the lithologies present within 15 feet of the surface at the UST 29 site appear to correlate with the regional stratigraphic section. The Part B SI soil boring logs are located in Appendix B. The lithology underlying the study area consists of interbedded layers of sand with varying amounts of silt and clay.

II.B.3. Stratigraphic Cross Sections

Stratigraphic cross sections were developed based on the Part A SI and Part B SI soil boring logs. Figure II-3 presents a south/north cross section (A-A') and a west/east cross section (B-B') illustrating the geology described in Section II.B.2.(b).

II.B.4. Referenced or Documented Calculations

Referenced or documented calculations performed to support the Part B SI include those used in developing and interpreting the results of geotechnical analysis and groundwater slug testing.

II.B.4.a. Geotechnical analysis

Disturbed soil samples were collected from soil borings 14-07, 14-08, 14-11, and 14-12 to determine selected engineering properties of the saturated zone underlying the UST 29 site. In addition, an undisturbed soil sample was collected from soil boring 14-10. The engineering properties measured included Unified Soil Classification System (USCS) classification, grain size, moisture content, Atterberg limits, porosity, specific gravity, and permeability, as presented in Table II-6 and Appendix D.1. The methods used for performing the geotechnical analyses were American Society for Testing and Materials (ASTM) D 422 (grain-size distribution), ASTM D 2216 (moisture content), ASTM D 4318 (Atterberg Limits), ASTM D 5084 (permeability), and EM 1110-2-1906 (specific gravity and porosity).

II.B.4.b. Slug testing

A rising head slug test was conducted in monitoring well 14-07 to obtain a value for the hydraulic conductivity (k) of the water-bearing zone (Appendix D.2). A Well Sentinal data logger was used to obtain accurate results

during the slug tests, and the results were analyzed using the Bouwer and Rice Method (Bouwer and Rice 1976).

Due to the high conductivity of the formation, the water level recovered to static levels within approximately 1 minute after removal of the slug. As a result, the initial portion of the drawdown-time curve was used to estimate the conductivity value. The calculated value for hydraulic conductivity obtained from the slug test was 2.0×10^{-3} cm/sec (Appendix D.2).

II.B.5. Direction of Groundwater Flow

II.B.5.a. Well construction details

Following contact with fully saturated material in a soil boring, a water level measurement was taken to determine the remaining depth to be drilled. This measurement was necessary to ensure the placement of at least 7.0 feet of well screen below the water table, in accordance with the Work Plan. Due to the shallow depth of the water table, less than 4.0 feet bgs, the screen length, filter pack height above the screen, and thickness of the bentonite seal were modified in the field.

Monitoring well casing consisted of 2-inch inside diameter Schedule 40 flush-thread polyvinyl chloride (PVC) risers and screens in 5- and 10-foot sections. The well screen slot size was 0.010 inch. Table II-7 summarizes construction details for Part A SI PowerPunch sampling points and Part B SI monitoring wells. Well construction diagrams are presented in Appendix C. Following installation of the well casing, No. 1A filter pack sand was poured while the augers were gradually removed to ensure a complete and even distribution of the filter pack. The filter pack extended to a measured level at least 0.5 foot above the top of the well screen.

Well seals were composed of 3/8-inch bentonite pellets and allowed to hydrate before the annular space above the seal was filled. The total volume of potable water used to hydrate the pellets averaged 2 gallons per well. The well seal extended to a measured level of at least 0.5 foot above the top of the filter pack.

Above the well seal, the remaining annular space was completed with a 1.0-foot-long flush-mount sheet steel protective casing that was grouted in place with a 14-inch-diameter by 4-inch-thick, high-strength concrete pad. Well casings were capped with expandable locking caps. Protective casings were covered with bolted cast iron manhole covers. Inscribed monitoring well identification plates were permanently affixed to the inside of each manhole cover.

II.B.5.b. Potentiometric mapping

Water level measurements were collected 24 hours after piezometer installation in September 1996 during the Part A SI, and in December 1997 and January 1999 during Part B SI groundwater sampling activities. Data obtained from these measurements are presented in Table II-8. During the Part A SI in September 1996, there was a groundwater divide through the site, with groundwater flowing to the northwest with a gradient of 0.040 foot/foot and to the southeast with a gradient of 0.077 foot/foot. Wells 14-07 and 14-09 were located adjacent to the area of highest Part A contamination and the underground utilities. Part B SI data were used to construct groundwater potentiometric surface maps for December 1997 and January 1999 (Figures II-16 and II-17). Based upon the potentiometric data, groundwater flow under the UST 29 site appeared to flow to the north-northwest in December 1997 with an average gradient of 0.012 foot/foot. Wells 14-11 and 14-12 were located downgradient of the area of highest Part A contamination. The groundwater flow direction in January 1999 was to the west with an average gradient of 0.0033 foot/foot.

II.B.5.c. Equipotential flow net

An equipotential flow net based on the January 1999 water level measurements and the contoured potentiometric surface is presented in Figure II-18.

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III. REMEDIAL ACTION PLAN

III.A. CORRECTIVE ACTION COMPLETED OR IN PROGRESS

III.A.1. Recovery/Removal of Free Product

No evidence of free product has been identified at the UST 29 site; therefore, no recovery/removal of free product has been performed.

III.A.2. Remediation/Treatment of Contaminated Backfill Material and Native Soils

Former UST 29 was a 1,000-gallon waste oil tank. It was removed in October 1995 after approximately 13 years of service. The UST, along with soil, was excavated and removed from the site. Notification letters, a Closure Report Form (GUST-29), a revised Notification Data for UST Form (GUST-42), and a CAP-Part A report were submitted to GA EPD in association with the UST removal activity. Elevated concentrations of TPH were detected in tank pit soils during UST removal and excavation activities. No further excavation of potentially contaminated backfill or native soils has occurred at the UST 29 site.

III.B. OBJECTIVE OF CORRECTIVE ACTION

III.B.1. Remove Free Product that Exceeds One-Eighth Inch

The ISC, Part A SI, and Part B SI determined that there is no evidence of free product at the UST 29 site; therefore, no recovery/removal of free product has been performed, nor was it required based on known site conditions.

III.B.2. Remediate Groundwater Contamination

The Part A SI documented groundwater that exceeded MCLs in one Part A SI boring. Benzene is the contaminant that exceeded its MCL in one of the six Part A groundwater samples. Further investigation during the Part B SI provided more groundwater contaminant data. These results suggest that contaminant concentrations at the perimeter of the plume are below MCLs. Groundwater is flowing toward the drainage ditch located 500 feet west of the site, and conservative fate and transport modeling using the AT123D model (Appendix E) suggests that benzene (the most conservative representative compound) will never exceed its MCL at the drainage ditch. The storm drain that is located 60 feet northwest of the area of the highest contamination is located above the water table; thus, it is not considered a potential preferential pathway. Active remediation of groundwater is not recommended for this site.

III.B.3. Remediate Soil Contamination

The Part A SI documented soil contamination above applicable GUST Soil Threshold Levels (i.e., Table A, column 2) in three locations. The contaminant that exceeded soil threshold levels was benzene. Further investigation during the Part B SI provided more soil contaminant data. The results suggest that contaminant concentrations at the perimeter of the site are below soil threshold levels. The contaminant concentrations are below risk-based screening levels that are protective of soil exposure during industrial land use. The site is located beneath 10 to 12 inches of concrete, which prevents incidental contact with the soil; therefore, active remediation of soil is not recommended.

III.B.4. Provide Risk-based Corrective Action

A risk-based approach was used to determine the need for further action at the UST 29 site. Due to the nature of the contamination (petroleum hydrocarbon contamination of groundwater), the risk-based approach was limited to human health concerns. Ecological risk concerns are negligible because of the lack of habitat available for ecological receptors as a result of the 10 to 12 inches of concrete overlying the site.

The methods for assessing human health concerns for the site were derived from GUST CAP-Part B guidance (GA EPD 1995) and recent GA EPD guidance (GA EPD 1996). These were supplemented by the additional guidance documents on risk assessment methods referenced in this section. In general, the risk-based corrective action (RBCA) approach is performed in two steps:

1. Results are screened against readily available regulatory levels and risk-based screening levels to identify chemicals of potential concern (COPCs).

2. Site-specific ACLs are developed for COPCs using the results of the fate and transport modeling and identified receptor locations.

The following sections present the conceptual model of the exposure setting and potential receptors as well as the general methodology employed to perform the screening for COPCs and the development of ACLs.

III.B.4.a. Potential receptor survey

The exposure assessment identifies any potentially complete pathways between the contaminant source and potential receptors. This involves identifying potential current and future receptors, release mechanisms through which contamination might come into contact with the receptors, and routes of exposure through which receptors might be exposed. Figure III-1 presents potentially complete and incomplete pathways for contaminant sources at the UST 29 site.

The UST 29 site is located within an active military installation and within an access-controlled fence of a secured motorpool. The land use at the site is currently military industrial. An Installation housing area is located approximately 3,500 feet to the northeast. A drainage ditch and Mill Creek are located approximately 500 feet and 2,000 feet west of the site, respectively.

No connection between site contamination and current off-site receptors has been identified. Site contamination may migrate to the surficial aquifer. The Hawthorn Group, which is approximately 90 feet of clay, separates the surficial aquifer from the deep drinking water aquifer, the Floridan aquifer. There appears to be no vertical migration from the surficial aquifer to the Floridan aquifer. None of the Installation's current water supply wells are located downgradient of the UST 29 site. The Hawthorn Group, a thick and highly effective confining unit, separates the water supply wells from the surficial aquifer.

No current on-site receptors have been identified for the site. Potential future on-site receptors might include industrial workers and military residents.

Potential future on-site industrial receptors may come in direct contact with site soil contamination during construction or excavation activities. No near-term on-site receptors are likely to come into contact with groundwater unless the surficial aquifer discharges into the drainage ditch.

III.B.4.b. Screening for chemicals of potential concern

III.B.4.b.1. Screening Methodology

The purpose of a risk evaluation screening is to identify the COPCs and areas of concern at a site and possibly to identify sites for which no further action is needed. The first step in the risk process uses screening levels that are readily obtainable and that, due to their conservative nature, can be used with a high degree of confidence to indicate sites for which no further action is required.

An American Society for Testing and Materials (ASTM) (ASTM 1995) Tier 1–type risk evaluation process will be applied to the data collected for the UST 29 site to identify any COPCs and media for which no further action is needed. The risk evaluation screen involves the steps listed below.

- Identify potential migration and exposure pathways associated with the site, and identify potential exposure scenarios that should be used to select screening levels.
- Identify risk-based screening levels and regulatory-based screening levels for each contaminant.
- Compare site-related concentrations to screening levels to determine if any COPCs exist at the site.
- Compare detection limits to screening levels to identify potential false negative screening results.

The screening levels for the UST 29 site data have been taken from the following sources based on GA EPD guidance (GA EPD 1996):

- federal MCLs (EPA 1989);
- GUST Soil Threshold Levels (i.e., Table A, Column 2);
- soil screening levels developed by the U.S. Environmental Protection Agency (EPA) (EPA 1996a); and
- soil and groundwater risk-based concentrations developed by EPA Region 3 (EPA 1996b).

These values reflect screening levels based on a combination of regulatory screening levels (i.e., MCLs and GUST soil threshold levels), and calculated risk-based values (i.e., EPA Region 3 risk-based concentrations).

Screening levels inherently incorporate assumptions about land use. In identifying COPCs, it is generally accepted that screening levels will reflect any potential future land uses, and thus, they usually reflect a conservative residential use scenario (EPA 1991; EPA 1996a; ASTM 1995). Based on GA EPD guidance, risk-based screening levels reflect residential land use for groundwater and industrial land use for deep soils (GA EPD 1996).

Default residential exposure scenarios for groundwater assume that use of the land could someday be residential and that the following exposures could occur:

- ingestion of groundwater and
- inhalation of volatiles during showering.

The default industrial exposure assumptions for deep soils assume that the following exposures could occur:

- incidental ingestion of soil and
- inhalation of volatiles and dust.

EPA's Soil Screening Guidance (EPA 1996a) provides two options for selecting soil values that address protection of groundwater. One value assumes no contaminant dilution or attenuation would occur between the soil and groundwater; a second value assumes a 20-fold dilution attenuation factor (DAF). A DAF of 20 was used to develop soil screening values protective of groundwater at the UST 29 site.

If ARAR- or risk-based values are not available, it generally means that (1) the chemical is not considered to be toxic except perhaps at extremely high concentrations (e.g., aluminum, sodium); (2) the dose-response data do not indicate a toxic effect; or (3) EPA is currently reviewing toxicity information, and no reference dose or cancer slope factor is currently available.

III.B.4.b.2. Screening Results

The risk screening process is a systematic screening of sample results to identify site-related COPCs. Chemical concentrations below risk- or regulatory-based screening levels are not considered COPCs and are not evaluated further. Tables III.1 and III.2 present the results of the risk-based screening for the Part A SI soil data and the Part B SI soil data, respectively. Tables III.3 and III.4 present the results of the risk-based screening for the Part A SI groundwater data and the Part B SI groundwater data, respectively.

Benzene was detected above the GUST soil threshold level (8 µg/kg) in three samples and the risk-based screening value based on leaching to groundwater in one soil sample collected for the Part A SI. Ethylbenzene, lead, naphthalene, toluene, xylenes, and TPH were detected below screening levels during the Part A sampling. No detections exceeded screening levels for the Part B SI. Benzene was selected as a COPC for UST 29 site soils.

In general, the detection limits for benzene and several PAHs were below GUST soil threshold levels and risk-based screening levels for the Part A and Part B soil data. However, the detection limit for one Part B sample exceeded the GUST soil threshold level and the risk-based screening level for benzene. No additional COPCs for soils were selected for the site based on the detection limit screening.

One detection for benzene (238 µg/L) and two estimated detections (2.8 µg/L and 2.4 µg/L) in three Part A temporary wells (14-03, 14-02, and 14-06, respectively) for the Part A data exceeded the risk-based screening level for benzene of 0.36 µg/L. The detection in temporary well 14-03 also exceeded the federal MCL for benzene of 5 µg/L. Lead was detected above the technology action level of 15 µg/L in all six temporary wells sampled during the Part A investigation, with concentrations ranging from 25.6 to 1,060 µg/L. Ethylbenzene, naphthalene, toluene, and xylenes were detected below screening values for the Part A SI.

Two detections for benzene (238 µg/L and 12.8 µg/L) and one estimated detection (4.5 µg/L) in three Part B wells (14-08, 14-09, and 14-11, respectively) exceeded the risk-based screening level during the Part B investigation. The benzene detections in 14-08 and 14-09 exceeded the federal MCL for benzene of 5 µg/L. Lead was not sampled for during the Part B SI. Ethylbenzene, naphthalene, and xylenes were detected below screening values during the Part B SI. Iron was also detected during the Part B investigation, but no screening levels exist for evaluation of the chemical. Benzene and lead were selected as COPCs for the UST 29 site groundwater.

Detection limits for several PAHs exceeded risk-based screening levels for the Part A and Part B groundwater data. For these chemicals, risk-based values represent values below analytically achievable levels. The detection limits for one PAH, benzo(*a*)pyrene, also exceeded the federal MCL of 0.2 ppb by one to two orders of magnitude. The semivolatile analysis results for sample 1404W2 were rejected ("R" qualified) because the surrogate recovery was zero and the matrix spike/matrix spike duplicate recovery was below the lower control limit. No additional COPCs were selected for groundwater based on the detection limit screening.

III.B.4.b.3. Uncertainties

Groundwater samples collected during the Part A SI were collected from PowerPunch sampling devices or temporary piezometers. These samples contained a large amount of suspended solids and were very turbid. The lead concentrations in these samples could be attributable to the suspended particles and not the result of contaminated groundwater.

III.B.4.c. Site-specific levels

Detections exceeding the conservative generic screening levels are considered COPCs. ACLs are developed, when appropriate, for the COPCs using site-specific information. ACLs were developed from available regulatory screening levels. When regulatory screening levels were not available, then ACLs were developed based on risk-based levels. No risk-based ACLs were developed for UST 29.

III.B.4.c.1. Alternate Threshold Levels

Both the Part A and Part B data were screened against risk- and regulatory-based screening levels. Benzene was selected as a COPC for UST 29 site soils. Benzene and lead were selected as COPCs for site groundwater.

Benzene was selected as a COPC for UST 29 site soils. Benzene concentrations in soil exceeded the GUST soil threshold levels and risk-based screening levels. Direct contact with the contamination in the soil will not occur at the site. The former location of UST 29 is completely covered by high-strength concrete. The concrete prevents direct contact with soils and limits the percolation of rainwater through the site soils that would cause the benzene to leach to the groundwater. Current and future land use scenarios for the site indicate that this concrete will remain in place for the foreseeable future. As such, no actual risks to an on-site receptor will occur because no pathway exists through which a receptor will encounter contaminated media; thus, no alternate threshold levels were developed for soils.

III.B.4.c.2. Alternate Concentration Limits

Benzene and lead were identified as COPCs for groundwater at the site. Benzene was modeled to two potential downgradient locations where a receptor may come in contact with migrating site contamination. These two locations include a drainage ditch and Mill Creek. Fate and transport modeling was used to develop site-specific DAFs between the source and the receptor locations (see III.B.4.c.3 below). Modeling results indicate that contamination will never reach Mill Creek; thus, no ACLs were developed for this potential pathway. Modeling to the drainage ditch estimated a DAF of 110. The MCL for benzene is 5 µg/L, and the technology action level for lead is 15 µg/L. Adjusting these regulatory levels using the site-specific DAF identified for the potential migration of contamination from the site to the ditch results in an ACL for benzene of 550 µg/L and an ACL for lead of 1,650 µg/L.

III.B.4.c.3. Fate and transport model

Site-specific DAFs between the source and the receptor locations were developed. The DAF is a numerical value that represents the attempt to mathematically quantify the natural physical, chemical, and biological processes (e.g., advection-dispersion, sorption-retardation, biodegradation, volatilization) that result in the decrease of a chemical concentration in an environmental medium. In simple terms, the DAF is the ratio of chemical concentration at the source (or the point of origin) to the concentration at the exposure point. The DAFs reflect the natural attenuation concepts outlined in ASTM's RBCA protocol (ASTM 1995).

Fate and transport models are used as a tool for developing DAFs. The application of fate and transport models at any release site must ensure that the modeling results are protective of human health and the environment. Therefore, the selection process of a predictive model at a release site must consider its performance, characteristics, and applicability to the site being considered. The following characteristics were considered before selecting an appropriate model for the Installation:

- the model provides conservative predictions,
- the model is technically sound,
- the model is a public-domain model or is readily available,
- the model has received adequate peer review,
- the model has been applied to other similar sites, and
- the model is easy to use.

The Analytical Transient 1-, 2-, 3-Dimensional Model (AT123D) meets all of the above criteria, and was selected for performing fate and transport analysis for this site. AT123D is a well-known and commonly used analytical groundwater pollutant fate and transport model. It computes the spatial-temporal concentration distribution of chemicals in the aquifer system and predicts the transient spread of a chemical plume through a groundwater aquifer. The fate and transport processes accounted for in AT123D are advection, dispersion, adsorption/retardation, and decay. This model can be used as a tool for estimating the dissolved concentration of a chemical in one, two, or three dimensions in the groundwater resulting from a mass release (either continuous or instant or depleting source) over a source area (i.e., point, line, area, or volume source).

The AT123D model was used to determine the impact of dissolved hydrocarbons on potential receptors. A steady-state AT123D model was developed by calibrating the model against observed maximum concentrations in the groundwater beneath the UST 29 site. Modeling of the leaching of soil contamination to the groundwater was not performed because the additional contaminant contribution to the groundwater was negligible compared to the existing groundwater contamination. Potential receptors are a drainage ditch located 500 feet west of the site and Mill Creek located approximately 2,000 feet west of the site. There are numerous underground utilities at the site; however, most of the utilities are located upgradient of the former tank pit. A catch basin for a storm drain is located approximately 60 feet downgradient of the site; the depth of the basin is approximately 2.0 feet bgs. Thus, the storm drain is above the water table and is not a potential preferential pathway for contaminant migration.

Vertical migration of the contaminant plume through the confining unit to the Principal Artesian aquifer is improbable. The confining unit has a vertical hydraulic conductivity on the order of 10^{-8} cm/sec and ranges from 15 to 90 feet in thickness. Assuming a vertical gradient of 1.0 foot/foot and an effective porosity of 0.06 (Mills et al. 1985) for the confining unit, the groundwater travel time is estimated to be 87 years. Therefore, it would take more than 400 years for the benzene contamination to migrate through the confining layer. The surficial aquifer in which the contaminant plume is located is not used as a source of drinking water.

The fate and transport modeling results are provided in Appendix E. Two potential downgradient locations, a drainage ditch and Mill Creek, at which a receptor might encounter migrating groundwater contamination were modeled. These are the nearest possible locations at which a receptor might encounter migrating groundwater contamination due to a possible hydraulic connection between the groundwater and the surface water in the ditch and the creek. Contaminant fate and transport simulations were performed to predict the maximum concentrations at these receptor locations over a simulation period of 100 years. The modeling results indicate that benzene will not reach the ditch at concentrations above the MCl or the creek at detectable levels; therefore, surface water will not be impacted at concentrations above MCLs by the current site conditions at the UST 29 site, Facility ID #: 9-089088.

Based on modeling results, the estimated DAFs for benzene at the drainage ditch and the Mill Creek are 110 and 400,000, respectively. Simulations were also performed to predict the maximum concentrations of benzene over a simulation period of 2 years in the downgradient wells that will be used for long-term monitoring. The selected wells are 14-08, 14-09, 14-11, and 14-12 and the predicted 2-year maximum concentrations in these wells are 90 µg/L, 35 µg/L, 43 µg/L, and 10 µg/L, respectively.

III.B.4.d. Conclusions and recommendations

The conclusions below are based on a review of the Part A SI and Part B SI results using a risk-based approach.

- Risk-based screening results show that benzene and lead concentrations in groundwater exceed the initial screening levels. Using results of the fate and transport modeling, the benzene and lead concentrations in groundwater do not exceed their respective ACLs.

- The horizontal and vertical extent of soil and groundwater contamination was determined during the Part B SI.

- Fate and transport modeling of benzene indicates that contamination will never exceed MCLs at the conservatively defined downgradient receptors, a drainage ditch and Mill Creek.

Considering the site characteristics, natural attenuation will provide the best corrective action for this site. A monitoring program is recommended to confirm modeling predictions. Detailed sampling and analysis recommendations are provided in Section III.D.

III.C. DESIGN AND OPERATION OF CORRECTIVE ACTION SYSTEMS

III.C.1. System Effectiveness/Basis for Selection

The selected corrective action approach, natural attenuation, was chosen following evaluation of numerous established and innovative active and passive remediation alternatives. A three-step screening process was used to select the preferred remedy for the UST 29 site. This alternative selection process is illustrated in Figure III-2.

III.C.1.a. Theory and feasibility

The presumed remedies for dissolved hydrocarbon contamination in groundwater are provided in Table III-5. Based on the low hydrocarbon concentrations near the former UST and the lack of any nearby receptors, natural attenuation is the preferred alternative. Natural attenuation is based on the premise that fuel-type hydrocarbons are readily biodegraded in most environmental systems. Biodegradation of BTEX has been documented for sites with conditions similar to those at the UST 29 site (e.g., shallow water table, permeable silty sand). In fact, the conditions at the UST 29 site are similar to those at other sites that are ideal for biodegradation (Abou-Rizk et al. 1995). The site's groundwater flow and geology are conducive to aerobic biodegradation, which is known to produce the most rapid biodegradation rates for hydrocarbons. Finally, the source of the contamination has been removed; therefore, subsurface conditions (dissolved oxygen, oxidation-reduction potential, background nutrient availability) will steadily improve with time.

Other remedial options that were considered would introduce more risk of exposure due to contaminant release into other matrices (soil gas, air, treatment canisters) or due to excavation. In addition, the excessive costs associated with an aggressive remediation system do not result in added protection to the industrial worker receptor.

III.D. IMPLEMENTATION

III.D.1. Periodic Monitoring/Milestone Schedule

Monitoring of BTEX and PAH compounds from groundwater samples collected from 14-09, 14-11, 14-12 (downgradient), and 14-08 (highest contamination) will be completed on a semiannual basis. Two additional monitoring wells (14-13 and 14-14) will be installed downgradient of 14-11 as part of the long-term monitoring program (Figure III-3), and boring logs will be presented in the first long-term monitoring report. Analytical results from the two additional wells might change the wells that will be sampled semiannually. Sampling will be scheduled to reflect any impact due to seasonal fluctuation (wet/dry seasons). Sampling will occur within 6 months of the last sampling event or as technical resolutions are needed. Monitoring will continue for a period of 2 years, for a total of up to four sampling events (Figure III-4). The monitoring well will be purged using either a nondedicated pump or a disposable Teflon bailer. Purging will continue until either five well volumes of groundwater have been removed or the well is purged to dryness, whichever occurs first. Upon completion of well purging, a groundwater sample will be collected directly into laboratory containers for submittal to an approved off-site laboratory for chemical analysis. A small volume of groundwater will be collected into a clean glass container for field analysis of pH, specific conductance, and temperature.

In cases in which recharge to the monitoring well is rapid, groundwater samples will be collected immediately after purging. However, in cases in which recharge is slow, groundwater samples will be collected as soon as sufficient groundwater is present in the well. If the volume of groundwater sample collected from slow-recharge wells is not sufficient to perform both field parameter and chemical analysis, the entire volume of the sample will be used for chemical analysis, and measurements of field parameters will not be conducted.

Quality Assurance/Quality Control Sample Collection/Frequency

Two different types of quality control (QC) samples will be collected during performance of groundwater sampling activities. These sample types will be duplicates and trip blanks. During the sampling of groundwater from monitoring wells, QC duplicates will be collected along with field groundwater samples. The monitoring well locations selected for duplicate sampling will be random. The number of duplicate samples will be at least 10 percent of the entire sample population.

QC trip blanks consisting of sealed containers of ASTM Type I or equivalent water will be used for the project. One trip blank will be placed into each cooler used to store portions of groundwater samples designated for volatile organic analysis at the off-site laboratory. Trip blanks will be analyzed for BTEX only. These blanks will remain with the other sample containers until groundwater sampling is completed and the samples are shipped to the off-site laboratory for chemical analysis.

During each sampling event, water levels will be measured in all three monitoring wells. Specific conductivity and groundwater pH analyses will be completed on each sample from the monitoring wells from which analytical samples are collected. The samples will be shipped to an approved laboratory for BTEX analysis using EPA Method 8021B/8260B. PAH analysis is not recommended for the long-term monitoring program because naphthalene was the only compound detected, and it does not have a federal MCL or state IWQS and the concentrations are below the risk-based screening level. Therefore, PAH analysis is not required.

III.D.2. Progress Reporting

Within 60 days of each sampling event, a progress report will be submitted to present analytical results.

The format for the cover letter of the semiannual progress reports is provided below.

Progress Report #_____
Date:

The following analytical data were derived from samples collected _____ (date).

III.D.3. Certificate of Completion Report

Petition for permanent closure will be submitted with the final progress report. GA EPD will provide final approval for decommissioning of the monitoring wells, which will be requested in the final progress report. Decommissioning of monitoring wells will be completed in accordance with the USACE design manual for monitoring wells. Decommissioning will comply with all applicable state and federal standards.

The following certification will be submitted to GA EPD within 30 days of submittal of the final progress report:

I hereby certify that the Corrective Action Plan Part B, dated _____, 19___, for Fort Stewart Army Installation, UST 29 site, Facility ID#: 9-089088, including any and all certified amendments thereto, has been implemented in accordance with the schedules, specifications, sampling programs, and conditions contained therein, and that the plan's stated objectives have been met.

_____
Signature (Owner/Operator)

III.D.4. Inspection Schedule and Preventative Maintenance Program

During each sampling event, wells will be visually inspected for changes or damage. Any notable observations will be recorded in the subsequent progress report. Any required repairs to ensure the monitoring wells remain in conformance with GA EPD and EPA performance standards will be made as needed.

III.D.5. Periodic Monitoring

The sampling and monitoring program completed twice a year for 2 years will satisfy the need to detect changes in groundwater movement.

III.D.6. Effectiveness of Corrective Action

To determine the effectiveness of existing biodegradation, sample results will be compared to previous results and any increase/decrease will be noted. In addition, validation of the fate and transport model will be conducted after each sampling event and presented in the annual report to GA EPD.

III.D.7. Confirmatory Soil Sampling Plan

No excavation of soil is planned; therefore, confirmatory sampling will not be conducted.

III.D.8. Stockpiled Bulk Soil Sampling

No stockpiled soil will be generated with this corrective action; therefore, no soil sampling will be conducted.

III.D.9. Monitoring-only Termination Conditions

The monitoring system will be terminated after 2 years if measured benzene concentrations are less than or equal to those predicated by the fate and transport model in the downgradient wells. After four sampling events, the model will be validated, and if the model continues to predict no impact to the closest receptor, then a recommendation for no further action will be made to GA EPD.

III.D.10. Post-completion Site Restoration Activities

After termination has been granted, equipment and debris related to the monitoring program will be removed from the site.

III.E. PUBLIC NOTIFICATION

The UST 29 site is located entirely within the confines of the Fort Stewart Military Reservation, a federal facility. The U.S. Government owns all of the property contiguous to the site. The Fort Stewart DPW has complied with the public notice requirements defined by GA EPD guidance by publishing an announcement in the Savannah Morning News on February 8 and 15, 1998. A copy of the newspaper announcement used for public notification is presented in Appendix G of this report.

IV. CLAIM FOR REIMBURSEMENT

Fort Stewart is a federally owned facility and has funded the investigation for the UST 29 site, Facility ID #: 9-089088 using Environmental Restoration Account Funds. Application for Georgia Underground Storage Tank Trust Fund reimbursement is not being pursued at this time.

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TABLES

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Table II-1. Analytical Results of Part A Soil Samples Collected at the UST 29 Site, Facility ID #: 9-089088

Station:		14-01	14-01	14-02	14-02	14-03	14-03
Sample ID:	Georgia UST	1401B1	1401H1	1402C1	1402D1	1403A1	1403B1
Sample Interval:	Corrective	2.5' – 5.0'	17.5' – 20.0'	5.0' – 7.5'	7.5' – 10.0'	1.0' – 2.5'	2.5' – 5.0'
Medium:	Action Levels	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	21-Sep-96	21-Sep-96	20-Sep-96	20-Sep-96	8-Sep-96	8-Sep-96
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Volatile Organic Compounds							
Benzene	0.008	0.0057 U	0.0063 U	0.0057 U	0.0068 U	**0.0304 J**	**0.0116 =**
Ethylbenzene	10	0.0057 U	0.0063 U	0.0057 U	0.0068 U	0.132 J	0.0143 J
Toluene	6	0.027 =	0.0075 =	0.0071 J	0.0068 U	0.0127 J	0.006 U
Xylenes, total	700	0.0057 U	0.0063 U	0.0057 U	0.0068 U	0.309 J	0.0479 =
Polynuclear Aromatic Hydrocarbons							
2-Chloronaphthalene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Acenaphthene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Acenaphthylene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Anthracene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Benzo(*a*)anthracene	NRC	0.379 UJ	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Benzo(*a*)pyrene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Benzo(*b*)fluoranthene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Benzo(*g,h,i*)perylene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Benzo(*k*)fluoranthene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Chrysene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Dibenzo(*a,h*)anthracene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Fluoranthene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Fluorene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Indeno(*1,2,3-cd*)pyrene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Naphthalene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.775 =	0.385 U
Phenanthrene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Pyrene	NRC	0.379 U	0.418 U	0.37 U	0.445 U	0.358 U	0.385 U
Other Analytes							
Lead	NRC	5.9 =			4.6 =	3.8 J	
Total Petroleum Hydrocarbons	NRC	75.9 =	12.8 U	9.66 =	24.9 U	28.9 U	9.7 U

[a] Georgia Department of Natural Resources Applicable Soil Threshold Levels (i.e., Table A, Column 2).
10 Bold values exceed soil threshold levels.
NRC No regulatory criterion.
U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
= Indicates that the compound was detected at the concentration reported.

Table II-1. Analytical Results of Part A Soil Samples Collected at the UST 29 Site, Facility ID #: 9-089088 (continued)

Station:		14-04	14-04	14-05	14-05	14-06	14-06
Sample ID:	Georgia UST	1404A1	1404B1	1405A1	1405F1	1406A1	1406B1
Sample Interval:	Corrective	1.0' – 2.5'	2.5' – 5.0'	1.0' – 2.5'	10.0' – 12.5'	1.2' – 2.5'	2.5' – 5.0'
Medium:	Action Levels	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	8-Sep-96	8-Sep-96	15-Dec-96	15-Dec-96	15-Dec-96	15-Dec-96
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Volatile Organic Compounds							
Benzene	0.008	0.0056 U	0.0055 U	0.0054 U	0.0063 U	0.0059 J	**0.0152** =
Ethylbenzene	10	0.0056 U	0.0055 U	0.0138 =	0.0063 U	0.155 J	0.0111 J
Toluene	6	0.0062 =	0.0085 =	0.0063 =	0.0063 U	0.0088 J	0.0162 =
Xylenes, total	700	0.0056 U	0.0055 U	0.0139 J	0.0063 U	0.0355 J	0.0058 U
Polynuclear Aromatic Hydrocarbons							
2-Chloronaphthalene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Acenaphthene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Acenaphthylene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Anthracene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Benzo(*a*)anthracene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Benzo(*a*)pyrene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Benzo(*b*)fluoranthene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Benzo(*g,h,i*)perylene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Benzo(*k*)fluoranthene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Chrysene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Dibenzo(*a,h*)anthracene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Fluoranthene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Fluorene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Indeno(*1,2,3-cd*)pyrene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Naphthalene	NRC	0.363 U	0.357 U	0.359 J	0.411 U	0.364 =	0.382 U
Phenanthrene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Pyrene	NRC	0.363 U	0.357 U	0.359 U	0.411 U	0.364 U	0.382 U
Other Analytes							
Lead	NRC		1.3 J	3.1 =		3.9 =	
Total Petroleum Hydrocarbons	NRC	27 U	7.83 U	69.1 =	275 =	367 =	144 =

[a] Georgia Department of Natural Resources Applicable Soil Threshold Levels (i.e., Table A, Column 2).
10 Bold values exceed soil threshold levels.
NRC No regulatory criterion.
U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
= Indicates that the compound was detected at the concentration reported.

Table II-2. Analytical Results of Part B Soil Samples Collected at the UST 29 Site, Facility ID #: 9-089088

Station:		14-07	14-07	14-08	14-08	14-09	14-09
Sample ID:	Georgia UST	140711	140721	140811	140821	140911	140921
Sample Interval:	Corrective	2.5' – 5.0'	7.5' – 10.0'	10.0' – 12.5'	1.0' – 2.5'	10.0' – 12.5'	1.0' – 2.5'
Medium:	Action Levels	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Volatile Organic Compounds							
Benzene	0.008	0.0021 U	0.0023 UJ	0.0029 U	0.0022 U	0.0028 U	0.0021 U
Ethylbenzene	10	0.0021 UJ	0.0023 UJ	0.0029 UJ	0.0038 =	0.0028 U	0.0021 U
Toluene	6	0.0021 U	0.0023 UJ	0.0029 U	0.0037 J	0.0028 U	0.0021 U
Xylenes, total	700	0.0042 U	0.0042 UJ	0.0059 U	0.0246 =	0.0057 U	0.0042 U
Polynuclear Aromatic Hydrocarbons							
2-Chloronaphthalene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Acenaphthene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Acenaphthylene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Anthracene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Benzo(*a*)anthracene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Benzo(*a*)pyrene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Benzo(*b*)fluoranthene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Benzo(*g,h,i*)perylene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Benzo(*k*)fluoranthene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Chrysene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Dibenzo(*a,h*)anthracene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Fluoranthene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Fluorene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Indeno(*1,2,3-cd*)pyrene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Naphthalene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Phenanthrene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Pyrene	NRC	0.35 U	0.374 U	0.0925 U	0.359 U	0.468 U	0.344 U
Other Analytes							
Lead	NRC		3.2 =				1.5 =
Total Organic Carbon	NRC	1,470 =	3,360 =	3.35 U			1,720 =
Total Petroleum Hydrocarbons	NRC	15.2 U	35.5 U			36.5 U	17.5 U
TPH–Diesel-range Organics	NRC	4.6 U					
TPH–Gasoline-range Organics	NRC	0.0532 UJ					

[a] Georgia Department of Natural Resources Applicable Soil Threshold Levels (i.e., Table A, Column 2).

10 Bold values exceed soil threshold levels.

NRC No regulatory criteron.

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the compound was not detected above an approximated sample quantitation limit.

J Indicates that the value for the compound was an estimated value.

= Indicates that the compound was detected at the concentration reported.

Table II-2. Analytical Results of Part B Soil Samples Collected at the UST 29 Site, Facility ID #: 9-089088 (continued)

Station:		14-10	14-10	14-11	14-11	14-12	14-12
Sample ID:	Georgia UST	141011	141021	141111	141121	141211	141221
Sample Interval:	Corrective	5.0' – 7.5'	1.0' – 2.5'	5.0' – 7.5'	7.5' – 10.0'	12.5' – 15'	1.0' – 2.5'
Medium:	Action Levels	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	14-Nov-97	14-Nov-97	14-Nov-98	14-Nov-98	14-Nov-98	14-Nov-98
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Volatile Organic Compounds							
Benzene	0.008	0.0022 U	**0.0575 UJ**	0.0029 U	0.0028 U	0.0025 U	0.0021 U
Ethylbenzene	10	0.0022 UJ	0.463 J	0.0029 U	0.0028 U	0.0025 U	0.00055 J
Toluene	6	0.0022 U	0.0575 UJ	0.0010 J	0.0013 J	0.0017 J	0.0011 J
Xylenes, total	700	0.0045 U	1.18 J	0.0044 U	0.0042 U	0.0010 J	0.00061 J
Polynuclear Aromatic Hydrocarbons							
2-Chloronaphthalene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Acenaphthene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Acenaphthylene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Anthracene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Benzo(*a*)anthracene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Benzo(*a*)pyrene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Benzo(*b*)fluoranthene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Benzo(*g,h,i*)perylene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Benzo(*k*)fluoranthene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Chrysene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Dibenzo(*a,h*)anthracene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Fluoranthene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Fluorene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Indeno(*1,2,3-cd*)pyrene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Naphthalene	NRC	0.372 U	1.46 =	0.490 U	0.463 U	0.417 U	0.0512 J
Phenanthrene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Pyrene	NRC	0.372 U	0.381 U	0.490 U	0.463 U	0.417 U	0.351 U
Other Analytes							
Lead	NRC		2.9 =		14.7 J		1.3 J
Total Organic Carbon	NRC	541 =	5,820 =		13,000 =		3,010 =
Total Petroleum Hydrocarbons	NRC	26.1 U	220 =	6.81 U	8.31 J	7.44 J	21.9 =
TPH–Diesel-range Organics	NRC	33.9 =					
TPH–Gasoline-range Organics	NRC	0.0562 UJ					

[a] Georgia Department of Natural Resources Applicable Soil Threshold Levels (i.e., Table A, Column 2).
10 Bold values exceed soil threshold levels.
NRC No regulatory criteron.
U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound was an estimated value.
= Indicates that the compound was detected at the concentration reported.

Table II-3. Soil Field Screening Data Collected at the UST 29 Site, Facility ID #: 9-089088

Interval (feet bgs)	14-01 headspace [a] (ppm)	14-02 headspace (ppm)	14-03 headspace (ppm)	14-04 headspace (ppm)	14-05 headspace (ppm)	14-06 headspace (ppm)	14-07 headspace (ppm)	14-08 headspace (ppm)	14-09 headspace (ppm)	14-10 headspace (ppm)	14-11 headspace (ppm)	14-12 headspace (ppm)
0.0 – 2.5	0	0	21.6	0	14.5	133.3	0	25.2	66.0	196.0	8.5	31.6
2.5 – 5.0	16.2	0	0	0	2.1	5.8	0	7.0	60.0	NC	NC	NC
5.0 – 7.5	0	0	NA	NA	0	109.4	0	1.5	47.0	48.0	7.9	8.5
7.5 – 10.0	0	0	NA	NA	0	NC	0	0.5	47.0	NC	9.7	11.3
10.0 – 12.5	0	0	NA	NA	0	14.2	0	0	43.0	NC	NA	7.7
12.5 – 15.0	0	0	NA	NA	0	NC	NA	0	46.0	NA	NA	9.6
15.0 – 17.5	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17.5 – 20.0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

[a] Headspace measured using a photoionization detector.
NA Not applicable; interval is below the total depth of boring.
NC Not collected: no sample recovery or headspace measurements were not collected.

Table II-4. Analytical Results of Part A Groundwater Samples Collected at the UST 29 Site, Facility ID #: 9-089088

Station:			14-01	14-02	14-03	14-04	14-05	14-06
Sample ID:		In-stream	1401W2	1402W2	1403W2	1404W2	1405W2	1406W2
Medium:	Federal	Water Quality	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Collection Date:	SDWA MCLs[a]	Standards[b]	21-Sep-96	20-Sep-96	08-Sep-96	08-Sep-96	15-Dec-96	16-Dec-96
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Volatile Organic Compounds								
Benzene	5	71.28	5 U	2.8 J	**238** =	5 U	5 U	2.4 J
Ethylbenzene	700	28,718	5 U	0.17 J	71.4 =	5 U	0.098 J	0.53 J
Toluene	1,000	200,000	5 U	5 U	6 =	5 U	5 U	5 U
Xylenes, total	10,000	NRC	5 U	2.4 J	180 =	5 U	4.6 J	5 U
Polynuclear Aromatic Hydrocarbons								
2-Chloronaphthalene	NRC	NRC	10 U	10 U	10 U	10 R	10 U	10 UJ
Acenaphthene	NRC	NRC	10 U	10 U	10 U	10 R	10 U	10 UJ
Acenaphthylene	NRC	NRC	10 U	10 U	10 U	10 R	10 U	10 UJ
Anthracene	NRC	110,000	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*a*)anthracene	NRC	0.0311	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*a*)pyrene	0.2	0.0311	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*b*)fluoranthene	NRC	NRC	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*g,h,i*)perylene	NRC	NRC	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*k*)fluoranthene	NRC	0.0311	10 U	10 U	10 U	10 R	10 U	10 UJ
Chrysene	NRC	0.0311	10 U	10 U	10 U	10 R	10 U	10 UJ
Dibenzo(*a,h*)anthracene	NRC	0.0311	10 U	10 U	10 U	10 R	10 U	10 UJ
Fluoranthene	NRC	370	10 U	10 U	10 U	10 R	10 U	10 UJ
Fluorene	NRC	14,000	10 U	10 U	10 U	10 R	10 U	10 UJ
Indeno(*1,2,3-cd*)pyrene	NRC	0.0311	10 U	10 U	10 U	10 R	10 U	10 UJ
Naphthalene	NRC	NRC	10 U	10 U	51.2 =	10 R	10 U	10 UJ
Phenanthrene	NRC	NRC	10 U	10 U	10 U	10 R	10 U	10 UJ
Pyrene	NRC	11,000	10 U	10 U	10 U	10 R	10 U	10 UJ
Other Analytes								
Lead	15[c]	NRC	**25.6** =	**99.8** =	**26.3** =	**132** =	**389** =	**1,060** =

[a] EPA Safe Drinking Water Act MCL.
[b] GA EPD water quality standard (Chapter 391-3-6.03).
[c] Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991).
10 Bold values exceed MCLs.
NRC No regulatory criterion.
U Indicates that the compound was not detected at the concentration reported.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound is an estimated value.
= Indicates that the compound was detected at the concentration reported.

Table II-5. Analytical Results of Part B Groundwater and Surface Water Samples Collected at the UST 29 Site, Facility ID #: 9-089088

Station:			14-07	14-08	14-09	14-11	14-12
Sample ID:		In-stream	1407W2	1408W2	1409W2	141122	141212
Medium:	Federal	Water Quality	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Collection Date:	SDWA MCLs[a]	Standards[b]	14-Dec-97	15-Dec-97	14-Dec-97	07-Jan-99	03-Dec-98
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Volatile Organic Compounds							
Benzene	5	71.28	2 U	**238** =	**12.8** =	4.5 J	2 U
Ethylbenzene	700	28,718	2 U	179 =	2 U	5 U	2 U
Toluene	1,000	200,000	2 U	20 U	2 UJ	0.52 J	2 U
Xylenes, total	10,000	NRC	4 U	295 =	7.1 =	0.52 J	3 U
Polynuclear Aromatic Hydrocarbons							
2-Chloronaphthalene	NRC	NRC	10 U	9.9 U	10 U	10.6 U	10 U
Acenaphthene	NRC	NRC	10 U	9.9 U	10 U	10.6 U	10 U
Acenaphthylene	NRC	NRC	10 U	9.9 U	10 U	10.6 U	10 U
Anthracene	NRC	110,000	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*a*)anthracene	NRC	0.0311	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*a*)pyrene	0.2	0.0311	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*b*)fluoranthene	NRC	NRC	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*g,h,i*)perylene	NRC	NRC	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*k*)fluoranthene	NRC	0.0311	10 U	9.9 U	10 U	10.6 U	10 U
Chrysene	NRC	0.0311	10 U	9.9 U	10 U	10.6 U	10 U
Dibenzo(*a,h*)anthracene	NRC	0.0311	10 U	9.9 U	10 U	10.6 U	10 U
Fluoranthene	NRC	370	10 U	9.9 U	10 U	10.6 U	10 U
Fluorene	NRC	14,000	10 U	9.9 U	10 U	10.6 U	10 U
Indeno(*1,2,3-cd*)pyrene	NRC	0.0311	10 U	9.9 U	10 U	10.6 U	10 U
Naphthalene	NRC	NRC	10 U	67.1 =	10 U	10.6 U	13 =
Phenanthrene	NRC	NRC	10 U	9.9 U	10 U	10.6 U	10 U
Pyrene	NRC	11,000	10 U	9.9 U	10 U	10.6 U	10 U
Other Analytes							
Iron (dissolved)	NRC	NRC	66,800 =	17,300 =	36,400 =		

[a] EPA Safe Drinking Water Act MCL.
[b] GA EPD water quality standard (Chapter 391-3-6.03).
10 Bold values exceed MCLs.
NRC No regulatory criterion.
U Indicates that the compound was not detected at the concentration reported.
UJ Indicates that the compound was not detected above an approximated sample quantitation limit.
J Indicates that the value for the compound is an estimated value.
= Indicates that the compound was detected at the concentration reported.

Table II-6. Geotechnical Results of Soil Samples Collected at the UST 29 Site, Facility ID #: 9-089088

Parameter	14-07	14-08	14-10	14-11	14-12
Depth Interval (feet bgs)	10.0 – 12.5	12.5 – 15.0	10.0 – 12.0	10.0 – 12.0	15.0 – 17.0
Grain-size Analysis – % Fines	5	1	1	9	6
Grain-size Analysis – % Sand	92	96	98	91	94
Grain-size Analysis – % Gravel	0	3	1	0	0
Liquid Limit	118.3	NP	NP	NP	NP
Plastic Limit	32.5	NP	NP	NP	NP
Plasticity Index	85.8	NP	NP	NP	NP
Natural Moisture Content (%)	50.4	25.0	12.7	20.0	20.3
Porosity	-	-	0.49	-	-
Specific Gravity	-	-	2.76	-	-
Permeability (cm/sec)	-	-	1.72×10^{-5}	-	-

Table II-7. PowerPunch (Part A SI) and Monitoring Well (Part B SI) Construction Details at the UST 29 Site, Facility ID #: 9-089088

Boring/Well Number	Date Installed	Boring Depth (feet bgs)	Screened Interval (feet bgs)	Base of Seal (feet bgs)	Type of Completion	Ground Surface Elevation (feet NAD 29)	Top of Casing Elevation (feet NAD 29)
14-01	9/21/96	20.0	15.0 – 20.0	N/A	PowerPunch	70.56	N/A
14-02	9/20/96	15.0	10.0 – 20.0	N/A	PowerPunch	70.28	N/A
14-03	9/8/96	9.0	4.0 – 9.0	N/A	PowerPunch	70.29	N/A
14-04	9/8/96	8.0	3.0 – 8.0	N/A	PowerPunch	71.87	N/A
14-05	12/15/96	17.0	15.0 – 17.0	N/A	PowerPunch	70.21	N/A
14-06	12/15/96	15.0	10.0 – 15.0	N/A	PowerPunch	70.67	N/A
14-07	11/14/97	13.0	3.0 – 13.0	2.0	flush mount	N/A	71.06
14-08	11/14/97	15.0	3.0 – 13.0	2.0	flush mount	N/A	70.18
14-09	11/14/97	13.0	3.0 – 13.0	2.0	flush mount	N/A	70.59
14-10	11/14/97	12.0	N/A	N/A	soil boring	70.97	N/A
14-11	11/15/98	15.0	4.7 – 14.7	3.5	flush mount	N/A	69.91
14-12	11/15/98	20.0	9.7 – 19.7	8.0	flush mount	N/A	70.73

Table II-8. Water Level Measurements at the UST 29 Site, Facility ID #: 9-089088

Boring/Well Number	Date	Measuring Point Elevation (feet NGVD 29)	Depth to Water (feet BMP)	Groundwater Elevation (feet NGVD 29)
CAP Part A Investigation				
14-01	9/2296	70.56	4.95	65.61
14-02	9/21/96	70.28	3.50	66.78
14-03	9/9/96	70.29	1.97	68.32
14-04	9/9/96	71.78	2.52	69.35
14-05	12/16/96	70.21	4.24	65.94
14-06	12/17/96	70.67	Not Recorded	Not Recorded
CAP Part B Investigation				
14-07	12/14/97	71.06	3.48	67.58
14-08	12/14/97	70.18	2.47	67.71
14-09	12/14/97	70.59	3.14	67.45
14-07	1/8/99	71.06	4.80	66.26
14-08	1/8/99	70.18	4.10	66.08
14-09	1/8/99	70.59	4.57	66.02
14-11	1/8/99	69.91	3.98	65.93
14-12	1/8/99	70.73	4.74	65.99

BMP = Below measuring point (ground surface for borings and top of casing for monitoring wells).

NGVD = National Geodetic Vertical Datum.

Table III-1. Risk-based Screening of Part A Soil Data at the UST 29 Site, Facility ID #: 9-089088

Station:	Screening Levels			14-01	14-01	14-02	14-02	14-03	14-03
Sample ID:	Georgia UST			1401B1	1401H1	1402C1	1402D1	1403A1	1403B1
Sample Interval:	Corrective	Risk-based		2.5' – 5.0'	17.5' – 20.0'	5.0' – 7.5'	7.5' – 10.0'	1.0' – 2.5'	2.5' – 5.0'
Medium:	Action Levels	Screening	Leaching to	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	Level[b]	Groundwater[c]	21-Sep-96	21-Sep-96	20-Sep-96	20-Sep-96	8-Sep-96	8-Sep-96
Units:	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
Volatile Organic Compounds									
Benzene	8	200,000	30	5.7 U	6.3 U	5.7 U	6.8 U	**<u>30.4</u> J**	**11.6** =
Ethylbenzene	10,000	200,000,000	13,000	5.7 U	6.3 U	5.7 U	6.8 U	132 J	14.3 J
Toluene	6,000	410,000,000	12,000	27 =	7.5 =	7.1 J	6.8 U	12.7 J	6 U
Xylenes, total	700,000	1,000,000,000	190,000	5.7 U	6.3 U	5.7 U	6.8 U	309 J	47.9 =
Polynuclear Aromatic Hydrocarbons									
2-Chloronaphthalene[d]	N/A[e]	820,00,000	84,000	379 U	418 U	370 U	445 U	358 U	385 U
Acenaphthene	N/A[e]	120,000,000	570,000	379 U	418 U	370 U	445 U	358 U	385 U
Acenaphthylene	ND	610,00,000	4200,000	379 U	418 U	370 U	445 U	358 U	385 U
Anthracene	N/A[e]	610,000,000	12,000,000	379 U	418 U	370 U	445 U	358 U	385 U
Benzo(*a*)anthracene	N/A[e]	7,800	2,000	379 UJ	418 U	370 U	445 U	358 U	385 U
Benzo(*a*)pyrene	N/A[e]	780	8,000	379 U	418 U	370 U	445 U	358 U	385 U
Benzo(*b*)fluoranthene	N/A[e]	7,800	5,000	379 U	418 U	370 U	445 U	358 U	385 U
Benzo(*g,h,i*)perylene	N/A[e]	--	--	379 U	418 U	370 U	445 U	358 U	385 U
Benzo(*k*)fluoranthene	N/A[e]	78,000	49,000	379 U	418 U	370 U	445 U	358 U	385 U
Chrysene	N/A[e]	780,000	160,000	379 U	418 U	370 U	445 U	358 U	385 U
Dibenzo(*a,h*)anthracene	N/A[e]	780	2,000	379 U	418 U	370 U	445 U	358 U	385 U
Fluoranthene	N/A[e]	82,000,000	4,300,000	379 U	418 U	370 U	445 U	358 U	385 U
Fluorene	N/A[e]	82,000,000	560,000	379 U	418 U	370 U	445 U	358 U	385 U
Indeno(*1,2,3-cd*)pyrene	N/A[e]	7,800	14,000	379 U	418 U	370 U	445 U	358 U	385 U
Naphthalene	N/A[e]	82,000,000	84,000	379 U	418 U	370 U	445 U	358 U	385 U
Phenanthrene[f]	N/A[e]	61,000,000	4,200,000	379 U	418 U	370 U	445 U	775 =	385 U
Pyrene	N/A[e]	61,000,000	4,200,000	379 U	418 U	370 U	445 U	358 U	385 U
Other Analytes									
Lead	--	5,000,000	--	5,900 =			4,600 =	3,800 J	
Total Petroleum Hydrocarbons	--	--	--	75,900 =	12,800 U	9,660 =	24,900 U	28,900 U	9,700 U

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during industrial land use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.
10 Bold values indicate results exceeding Georgia UST action levels
10 Italicized values indicate results exceeding risk-based screening levels.
<u>10</u> Underlined values indicate results exceeding leaching-to-groundwater screening levels.
J Indicates that the value for the compound was an estimated value.
R Indicates that the sample results were unusable, and the presence or absence of the compound could not be verified.
U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
= Indicates that the compound was detected at the concentration reported.

Table III-1. Risk-based Screening of Part A Soil Data at the UST 29 Site, Facility ID #: 9-089088 (continued)

Station:	Screening Levels			14-04	14-04	14-05	14-05	14-06	14-06
Sample ID:	Georgia UST			1404A1	1404B1	1405A1	1405F1	1406A1	1406B1
Sample Interval:	Corrective	Risk-based		1.0' – 2.5'	2.5' – 5.0'	1.0' – 2.5'	10.0' – 12.5'	1.2' – 2.5'	2.5' – 5.0'
Media:	Action Levels	Screening	Leaching to	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	Level[b]	Groundwater[c]	8-Sep-96	8-Sep-96	15-Dec-96	15-Dec-96	15-Dec-96	15-Dec-96
Units:	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
Volatile Organic Compounds									
Benzene	8	200,000	30	5.6 U	5.5 U	5.4 U	6.3 U	5.9 J	**15.2** =
Ethylbenzene	10,000	200,000,000	13,000	5.6 U	5.5 U	13.8 =	6.3 U	155 J	11.1 J
Toluene	6,000	410,000,000	12,000	6.2 =	8.5 =	6.3 =	6.3 U	8.8 J	16.2 =
Xylenes, total	700,000	1,000,000,000	190,000	5.6 U	5.5 U	13.9 J	6.3 U	35.5 J	5.8 U
Polynuclear Aromatic Hydrocarbons									
2-Chloronaphthalene[d]	N/A[e]	82,000,000	84,000	363 U	357 U	359 U	411 U	364 U	382 U
Acenaphthene	N/A[e]	120,000,000	570,000	363 U	357 U	359 U	411 U	364 U	382 U
Acenaphthylene	ND	61,000,000	4,200,000	363 U	357 U	359 U	411 U	364 U	382 U
Anthracene	N/A[e]	61,0000,000	12,000,000	363 U	357 U	359 U	411 U	364 U	382 U
Benzo(*a*)anthracene	N/A[e]	7,800	2,000	363 U	357 U	359 U	411 U	364 U	382 U
Benzo(*a*)pyrene	N/A[e]	780	8,000	363 U	357 U	359 U	411 U	364 U	382 U
Benzo(*b*)fluoranthene	N/A[e]	7,800	5,000	363 U	357 U	359 U	411 U	364 U	382 U
Benzo(*g,h,i*)perylene	N/A[e]	--	--	363 U	357 U	359 U	411 U	364 U	382 U
Benzo(*k*)fluoranthene	N/A[e]	78,000	49,000	363 U	357 U	359 U	411 U	364 U	382 U
Chrysene	N/A[e]	780,000	160,000	363 U	357 U	359 U	411 U	364 U	382 U
Dibenzo(*a,h*)anthracene	N/A[e]	780	2,000	363 U	357 U	359 U	411 U	364 U	382 U
Fluoranthene	N/A[e]	82,000,000	4,300,000	363 U	357 U	359 U	411 U	364 U	382 U
Fluorene	N/A[e]	820,00,000	560,000	363 U	357 U	359 U	411 U	364 U	382 U
Indeno(*1,2,3-cd*)pyrene	N/A[e]	7,800	14,000	363 U	357 U	359 U	411 U	364 U	382 U
Naphthalene	N/A[e]	82,000,000	84,000	363 U	357 U	182 J	411 U	398 =	382 U
Phenanthrene[f]	N/A[e]	61,000,000	4,200,000	363 U	357 U	359 U	411 U	364 U	382 U
Pyrene	N/A[e]	61,000,000	4,200,000	363 U	357 U	359 U	411 U	364 U	382 U
Other Analytes									
Lead	--	5,000,000	--		1,300 J	3,100 =		3,900 =	
Total Petroleum Hydrocarbons	--	--	--	27,000 U	7,830 U	69,100 =	275,000 =	637,000 =	144,000 =

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during industrial land use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.
10 Bold values indicate results exceeding Georgia UST action levels.
10 Italicized values indicate results exceeding risk-based screening levels.
10 Underlined values indicate results exceeding leaching-to-groundwater screening levels.
J Indicates that the value for the compound was an estimated value.
R Indicates that the sample results were unusable and the presence or absence of the compound could not be verified
U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
= Indicates that the compound was detected at the concentration reported

Table III-2. Risk-based Screening of Part B Soil Data at the UST 29 Site, Facility ID #: 9-089088

Station:	Screening Levels			14-07	14-07	14-08	14-08	14-09	14-09
Sample ID:	Georgia UST			140711	140721	140811	140821	140911	140921
Sample Interval:	Corrective	Risk-based		2.5' – 5.0'	7.5' – 10.0'	10.0' – 12.5'	1.0' – 2.5'	10.0' – 12.5'	1.0' – 2.5'
Medium:	Action Levels	Screening	Leaching to	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	Level[b]	Groundwater[c]	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97
Units:	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
Volatile Organic Compounds									
Benzene	8	200,000	30	2.1 U	2.3 UJ	2.9 U	2.2 U	2.8 U	2.1 U
Ethylbenzene	10,000	200,000,000	13,000	2.1 UJ	2.3 UJ	2.9 U J	3.8 =	2.8 U	2.1 U
Toluene	6,000	410,000,000	12,000	2.1 U	2.3 UJ	2.9 U	3.7 J	2.8 U	2.1 U
Xylenes, total	700,000	1,000,000,000	190,000	4.2 U	2.3 UJ	5.9 U	24.6 =	5.7 U	4.2 U
Polynuclear Aromatic Hydrocarbons									
2-Chloronaphthalene[d]	N/A[e]	82,000,000	84,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Acenaphthene	N/A[e]	120,000,000	570,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Acenaphthylene	ND	61,000,000	4,200,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Anthracene	N/A[e]	610,000,000	12,000,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Benzo(*a*)anthracene	N/A[e]	7,800	2,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Benzo(*a*)pyrene	N/A[e]	780	8,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Benzo(*b*)fluoranthene	N/A[e]	7,800	5,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Benzo(*g,h,i*)perylene	N/A[e]			350 U	374 U	92.5 U	359 U	468 U	344 U
Benzo(*k*)fluoranthene	N/A[e]	78,000	49,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Chrysene	N/A[e]	780,000	160,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Dibenzo(*a,h*)anthracene	N/A[e]	780	2,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Fluoranthene	N/A[e]	82,000,000	4,300,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Fluorene	N/A[e]	82,000,000	560,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Indeno(*1,2,3-cd*)pyrene	N/A[e]	7,800	14,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Naphthalene	N/A[e]	82,000,000	84,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Phenanthrene[f]	N/A[e]	61,000,000	4,200,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Pyrene	N/A[e]	61,000,000	4,200,000	350 U	374 U	92.5 U	359 U	468 U	344 U
Other Analytes									
Lead	--	5,000,000	--		3,200 =				1,500 =
Total Organic Carbon	--	--	--	1,470,000 =	3,360,000 =	3,350,000 U			1,720,000 =
Total Petroleum Hydrocarbons	--	--	--	15,200 U	35,500 U			36,500 U	17,500 U
TPH–Diesel-range Organics	--	--	--	4,600 U					
TPH–Gasoline-range Organics	--	--	--	53.2 UJ					

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Protective of soil exposure during industrial land use.
[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
[d] Values based on naphthalene as a surrogate chemical.
[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.
[f] Values based on pyrene as a surrogate chemical.

10 Bold values indicate results exceeding Georgia UST action levels.

10 Italicized values indicate results exceeding risk-based screening levels.

10 Underlined values indicate results exceeding leaching-to-groundwater screening levels.
J Indicates that the value for the compound was an estimated value.
R Indicates that the sample results were unusable, and the presence or absence of the compound. could not be
U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the sample was not detected above an approximate sample quantitation limit.

= Indicates that the compound was detected at the concentration reported.

Table III-2. Risk-based Screening of Part B Soil Data at the UST 29 Site, Facility ID #: 9-089088 (continued)

Station:	Screening Levels			14-10	14-10	14-11	14-11	14-12	14-12
Sample ID:	Georgia UST			141011	141021	141111	141121	141211	141221
Sample Interval:	Corrective	Risk-based		5.0' – 7.5'	1.0' – 2.5'	5.0' – 7.5'	7.5' – 10.0'	12.5' – 15'	1.0' – 2.5'
Media:	Action Levels	Screening	Leaching to	Soil	Soil	Soil	Soil	Soil	Soil
Collection Date:	for Soil[a]	Level[b]	Groundwater[c]	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97	14-Nov-97
Units:	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
Volatile Organic Compounds									
Benzene	8	200,000	30	2.2 U	57.5 U/J	2.9 U	2.8 U	2.5 U	2.1 U
Ethylbenzene	10,000	200,000,000	13,000	2.2 UJ	463 J	2.9 U	2.8 U	2.5 U	.055 J
Toluene	6,000	410,000,000	12,000	2.2 U	57.5 UJ	1.0 J	1.3 J	1.7 J	1.1 J
Xylenes, total	700,000	1,000,000,000	190,000	4.5 U	1,180 J	4.4 U	4.2 U	1.0 J	0.61 J
Polynuclear Aromatic Hydrocarbons									
2-Chloronaphthalene[d]	N/A[e]	82,000,000	84,000	372 U	381 U	490 U	463 U	417 U	351 U
Acenaphthene	N/A[e]	120,000,000	570,000	372 U	381 U	490 U	463 U	417 U	351 U
Acenaphthylene	ND	61,000,000	4,200,000	372 U	381 U	490 U	463 U	417 U	351 U
Anthracene	N/A[e]	610,000,000	12,000,000	372 U	381 U	490 U	463 U	417 U	351 U
Benzo(*a*)anthracene	N/A[e]	7,800	2,000	372 U	381 U	490 U	463 U	417 U	351 U
Benzo(*a*)pyrene	N/A[e]	780	8,000	372 U	381 U	490 U	463 U	417 U	351 U
Benzo(*b*)fluoranthene	N/A[e]	7,800	5,000	372 U	381 U	490 U	463 U	417 U	351 U
Benzo(*g,h,i*)perylene	N/A[e]			372 U	381 U	490 U	463 U	417 U	351 U
Benzo(*k*)fluoranthene	N/A[e]	78,000	49,000	372 U	381 U	490 U	463 U	417 U	351 U
Chrysene	N/A[e]	780,000	160,000	372 U	381 U	490 U	463 U	417 U	351 U
Dibenzo(*a,h*)anthracene	N/A[e]	780	2,000	372 U	381 U	490 U	463 U	417 U	351 U
Fluoranthene	N/A[e]	82,000,000	4,300,000	372 U	381 U	490 U	463 U	417 U	351 U
Fluorene	N/A[e]	82,000,000	560,000	372 U	381 U	490 U	463 U	417 U	351 U
Indeno(*1,2,3-cd*)pyrene	N/A[e]	7,800	14,000	372 U	381 U	490 U	463 U	417 U	351 U
Naphthalene	N/A[e]	82,000,000	84,000	372 U	1460 =	490 U	463 U	417 U	51.2 J
Phenanthrene[f]	N/A[e]	61,000,000	4,200,000	372 U	381 U	490 U	463 U	417 U	351 U
Pyrene	N/A[e]	61,000,000	4,200,000	372 U	381 U	490 U	463 U	417 U	351 U
Other Analytes									
Lead	--	5,000,000	--		2,900 =		14,700 J		1,300 J
Total Organic Carbon	--	--	--	541,000 =	5,820,000 =		13,000,000 =		3,010,000 =
Total Petroleum Hydrocarbons	--	--	--	26,100 U	220,000 =	6,810 U	8,310 J	7,440 J	21,900 =
TPH–Diesel-range Organics	--	--	--	33,900 =					
TPH–Gasoline-range Organics	--	--	--	56.2 UJ					

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).

[b] Protective of soil exposure during industrial land use.

[c] Protective of groundwater ingestion. Used a dilution attenuation factor of 20.

[d] Values based on naphthalene as a surrogate chemical.

[e] Not applicable. The screening level exceeds the expected soil concentration under free product condition.

[f] Values based on pyrene as a surrogate chemical.

10 Bold values indicate results exceeding Georgia UST action levels.

10 Italicized values indicate results exceeding risk-based screening levels.

10 Underlined values indicate results exceeding leaching to groundwater screening levels.

J Indicates that the value for the compound was an estimated value.

R Indicates that the sample results were unusable, and the presence or absence of the compound could not be verified.

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the sample was not detected above an approximate sample quantitation limit.

= Indicates that the compound was detected at the concentration reported.

Table III-3. Risk-based Screening of Part A Groundwater Data at the UST 29 Site, Facility ID #: 9-089088

Station:	Screening Levels		14-01	14-02	14-03	14-04	14-05	14-06
Sample ID:		Risk-based	1401W2	1402W2	1403W2	1404W2	1405W2	1406W2
Medium:	Federal	Screening	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Collection Date:	SDWA MCLs	Level[a]	21-Sep-96	20-Sep-96	08-Sep-96	08-Sep-96	15-Dec-96	16-Dec-96
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Volatile Organic Compounds								
Benzene	5	0.36	5 U	2.8 J	**238** =	5 U	5 U	2.4 J
Ethylbenzene	700	1,300	5 U	0.17 J	71.4 =	5 U	0.098 J	0.53 J
Toluene	1,000	750	5 U	5 U	6 =	5 U	5 U	5 U
Xylenes, total	10,000	12,000	5 U	2.4 J	180 =	5 U	4.6 J	5 U
Polynuclear Aromatic Hydrocarbons								
2-Chloronaphthalene[b]	--	1,500	10 U	10 U	10 U	10 R	10 U	10 UJ
Acenaphthene	--	2,200	10 U	10 U	10 U	10 R	10 U	10 UJ
Acenaphthylene	--	1,100	10 U	10 U	10 U	10 R	10 U	10 UJ
Anthracene	--	11,000	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*a*)anthracene	--	0.092	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*a*)pyrene	0.2	0.0092	**10 U**	**10 U**	**10 U**	**10 R**	**10 U**	**10 UJ**
Benzo(*b*)fluoranthene	--	0.092	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*g,h,i*)perylene	--	--	10 U	10 U	10 U	10 R	10 U	10 UJ
Benzo(*k*)fluoranthene	--	0.92	10 U	10 U	10 U	10 R	10 U	10 UJ
Chrysene	--	9.2	10 U	10 U	10 U	10 R	10 U	10 UJ
Dibenzo(*a,h*)anthracene	--	0.0092	10 U	10 U	10 U	10 R	10 U	10 UJ
Fluoranthene	--	1,500	10 U	10 U	10 U	10 R	10 U	10 UJ
Fluorene	--	1,500	10 U	10 U	10 U	10 R	10 U	10 UJ
Indeno(*1,2,3-cd*)pyrene	--	0.092	10 U	10 U	10 U	10 R	10 U	10 UJ
Naphthalene	--	1,500	10 U	10 U	51.2 =	10 R	10 U	10 UJ
Phenanthrene[c]	--	1,100	10 U	10 U	10 U	10 R	10 U	10 UJ
Pyrene	--	1,100	10 U	10 U	10 U	10 R	10 U	10 UJ
Other Analytes		--						
Lead	15[d]	--	**25.6** =	**99.8** =	**26.3** =	**132** =	**389** =	**1,060** =

[a] Protective of tap water ingestion by a resident.
[b] Values based on naphthalene as a surrogate chemical.
[c] Values based on pyrene as a surrogate chemical.
[d] Technology Action Level (Federal Register, Vol. 56, No. 110, June 7, 1991.
10 Bold values indicate results exceeding federal Safe Drinking Water Act MCLs.
10 Underlined values indicate results exceeding risk-based screening levels.

J Indicates that the value for the compound was an estimated value.
R Indicates that the sample results were unusable, and the presence or absence of the compound, could not be verified.
SDWA Safe Drinking Water Act
U Indicates that the compound was not detected above the reported sample quantitation limit.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit.
= Indicates that the compound was detected at the concentration reported.

Table III-4. Risk-based Screening of Part B Groundwater Data at the UST 29 Site, Facility ID #: 9-089088

Station:	Screening Levels		14-07	14-08	14-09	14-11	14-12
Sample ID:		Risk-based	1407W2	1408W2	1409W2	141122	141212
Medium:	Federal	Screening	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Collection Date:	SDWA MCLs	Level[a]	14-Dec-97	15-Dec-97	14-Dec-97	07-Jan-99	03-Dec-98
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Volatile Organic Compounds							
Benzene	5	0.36	2 U	**238** =	**12.8** =	4.5 J	2 U
Ethylbenzene	700	1,300	2 U	179 =	2 U	5 U	2 U
Toluene	1,000	750	2 U	20 U	2 UJ	0.52 J	2 U
Xylenes, total	10,000	12,000	4 U	295 =	7.1 =	0.52 J	2 U
Polynuclear Aromatic Hydrocarbons							
2-Chloronaphthalene[b]	--	1,500	10 U	9.9 U	10 U	10.6 U	10 U
Acenaphthene	--	2,200	10 U	9.9 U	10 U	10.6 U	10 U
Acenaphthylene	--	1,100	10 U	9.9 U	10 U	10.6 U	10 U
Anthracene	--	11,000	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*a*)anthracene	--	0.092	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*a*)pyrene	0.2	0.0092	**10** U	**9.9** U	**10** U	**10.6** U	**10** U
Benzo(*b*)fluoranthene	--	0.092	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*g,h,i*)perylene	--	--	10 U	9.9 U	10 U	10.6 U	10 U
Benzo(*k*)fluoranthene	--	0.92	10 U	9.9 U	10 U	10.6 U	10 U
Chrysene	--	9.2	10 U	9.9 U	10 U	10.6 U	10 U
Dibenzo(*a,h*)anthracene	--	0.0092	10 U	9.9 U	10 U	10.6 U	10 U
Fluoranthene	--	1,500	10 U	9.9 U	10 U	10.6 U	10 U
Fluorene	--	1,500	10 U	9.9 U	10 U	10.6 U	10 U
Indeno(*1,2,3-cd*)pyrene	--	0.092	10 U	9.9 U	10 U	10.6 U	10 U
Naphthalene	--	1,500	10 U	67.1 =	10 U	10.6 U	13 =
Phenanthrene[c]	--	1,100	10 U	9.9 U	10 U	10.6 U	10 U
Pyrene	--	1,100	10 U	9.9 U	10 U	10.6 U	10 U
Other Analytes							
Iron (dissolved)	--	--	66,800 =	17,300 =	36,400 =		

[a] Protective of tap water ingestion by a resident.

[b] Values based on naphthalene as a surrogate chemical.

[c] Values based on pyrene as a surrogate chemical.

10 Bold values indicate results exceeding federal Safe Drinking Water Act MCLs.

12 Underlined values indicate results exceeding risk-based screening levels.

J Indicates that the value for the compound was an estimated value

R Indicates that the sample results were unusable and the presence or absence of the compound. could not be verified.

SWDA Safe Drinking Water Act

U Indicates that the compound was not detected above the reported sample quantitation limit.

UJ Indicates that the sample was not detected above an approximate sample quantitation limit.

= Indicates that the compound was detected at the concentration reported.

Table III-5. Groundwater Remedial Alternatives Comparison for the UST 29 Site, Facility ID #: 9-089088

Remedy[a]	Meets Objectives for UST 29 Site	Prevents Additional Risk of Exposure due to Remediation	Cost Effective	Reasons for Deferral
Natural Attenuation	Yes	Yes	Yes	--
Recirculation	Yes	No	Yes	Additional risk with groundwater pumping.
Air-sparging	Yes	No	No	Increased exposure to airborne contaminants; costs of installation/capital excessive.
Pump and Treat	Yes	No	No	Pump rate would be excessive to attain hydraulic capture; media disposal increases risk of exposure.
Passive Treatment Wall	Yes	Yes	No	Width of plume causes extensive cost to capture within the wall.

[a]Remedy Selection based on the Air Force Center for Environmental Excellence Remediation Matrix – Hierarchy of Preferred Alternatives – Dissolved Fuel in Groundwater (BTEX), 1994.

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FIGURES

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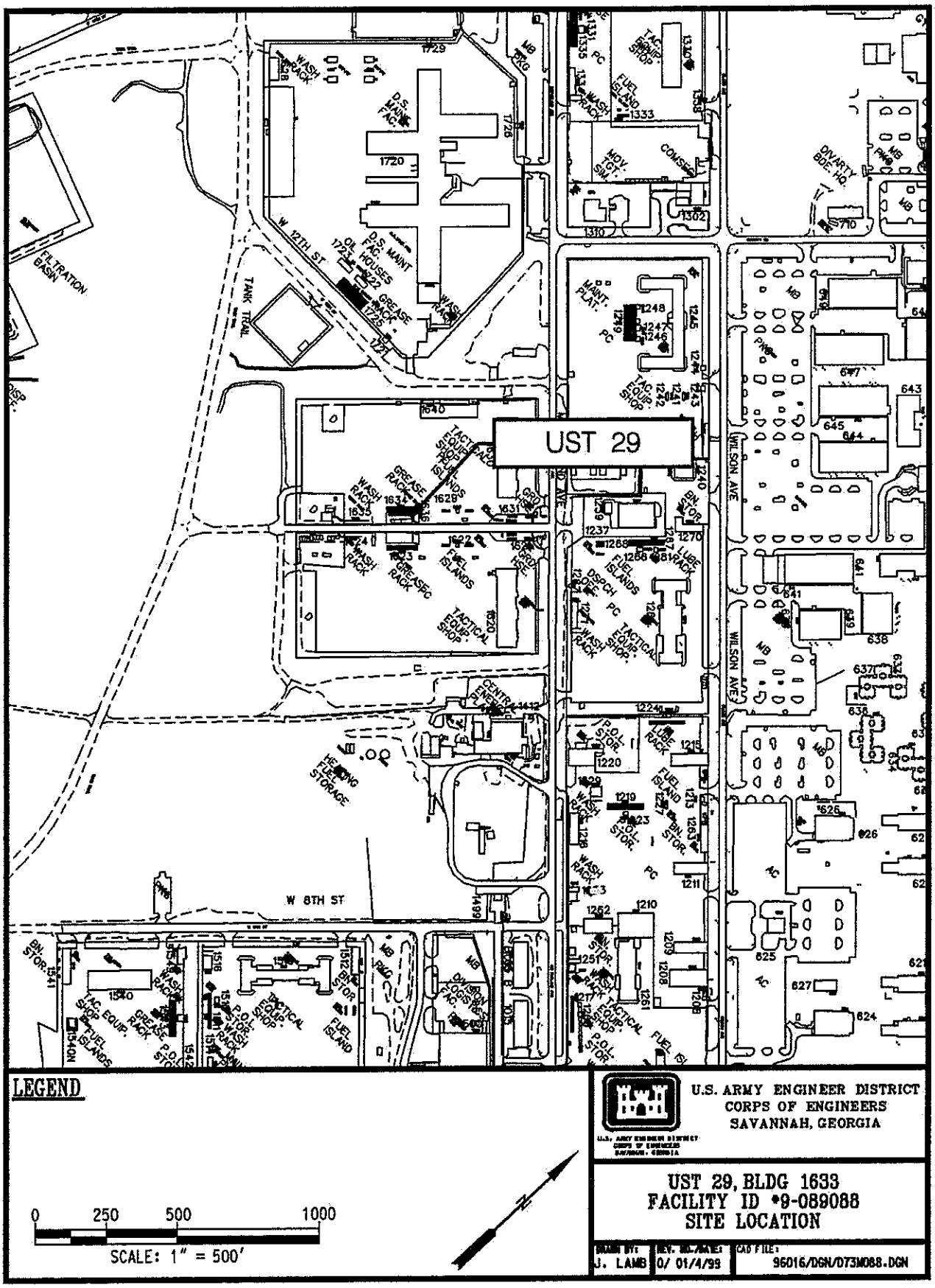

Figure II-1. Location Map for the UST 29 Site, Facility ID #: 9-089088.

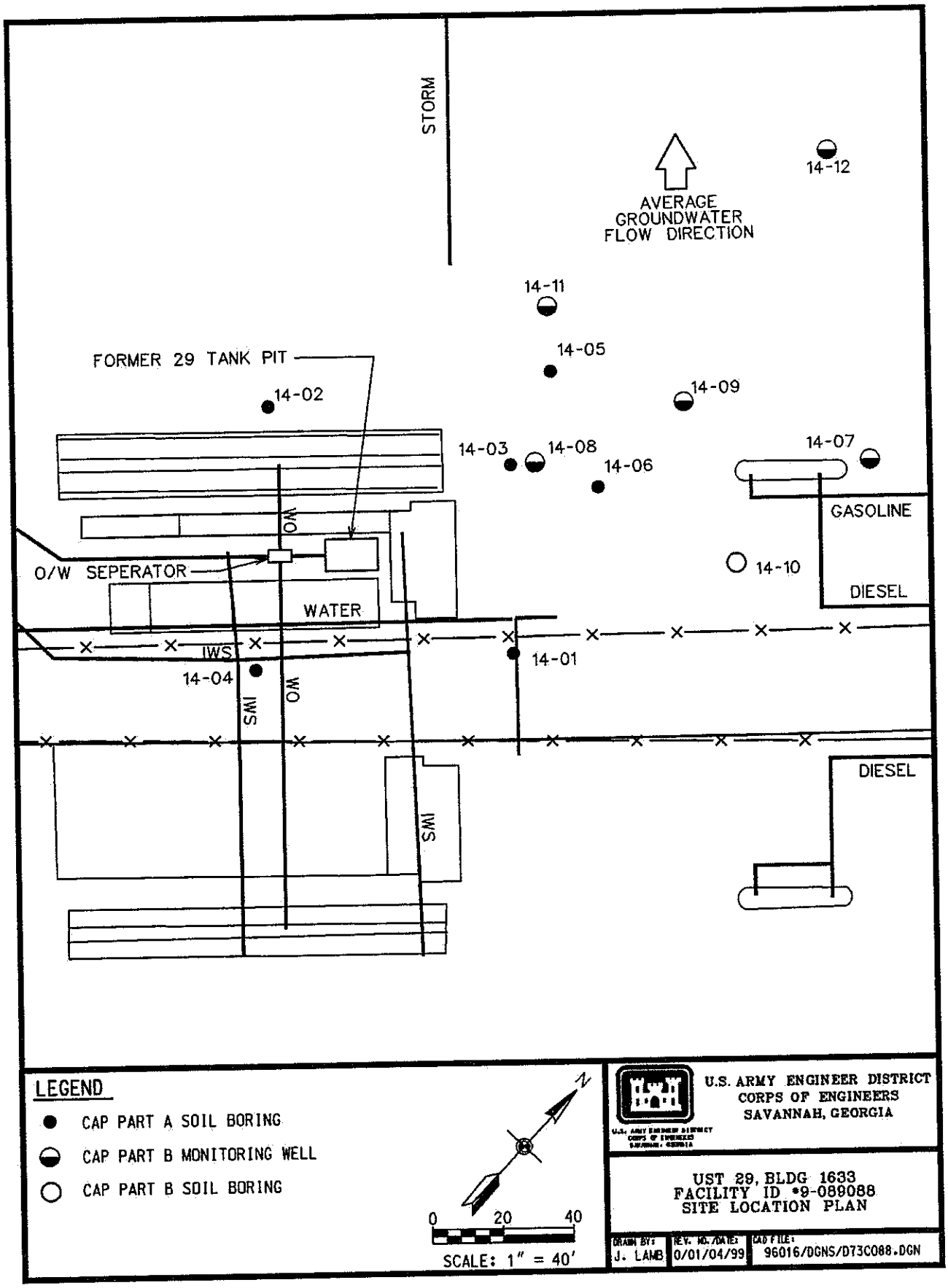

Figure II-2. Site Map of the UST 29 Site, Facility ID #: 9-089088.

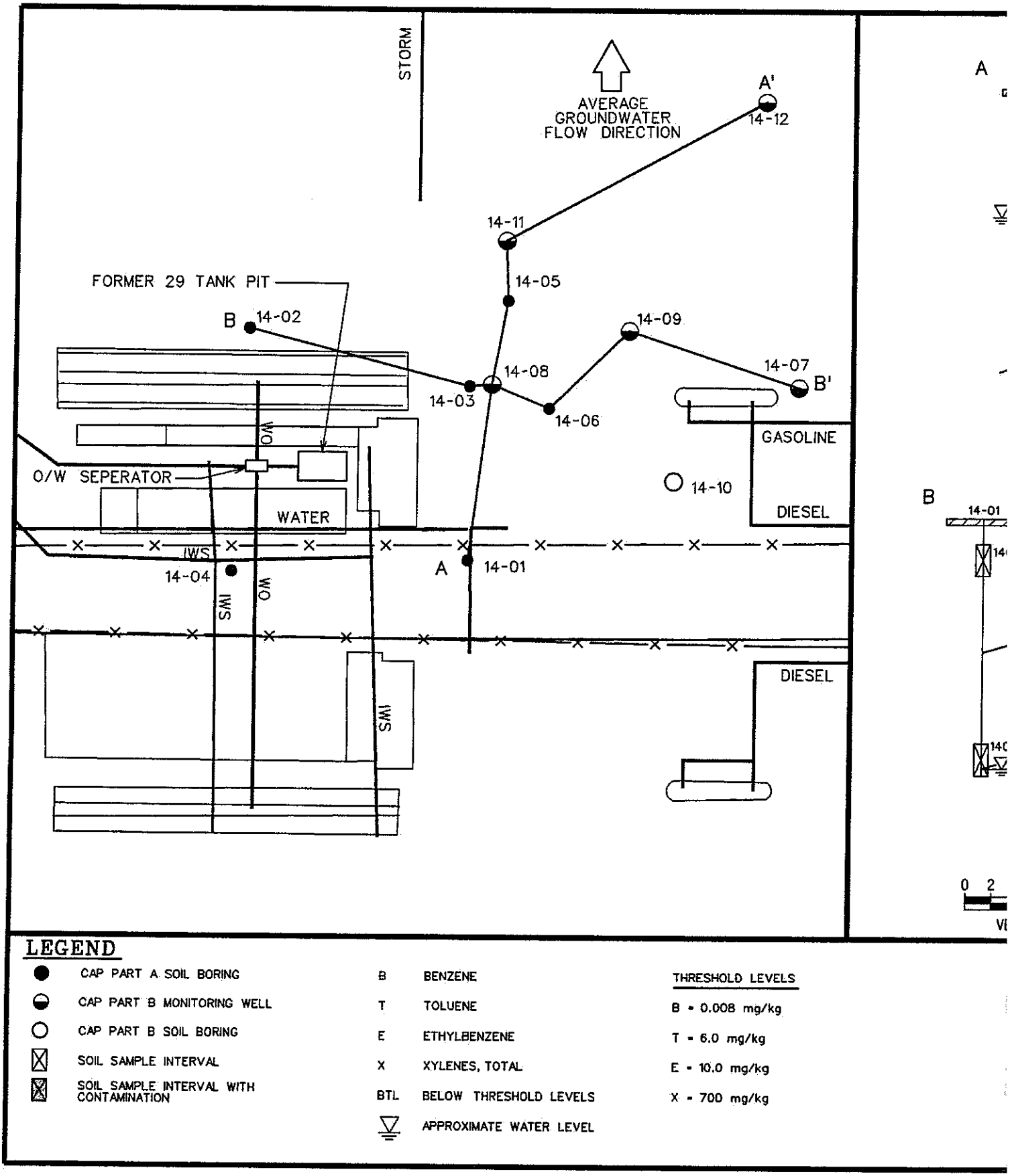

Figure II-3. CAP Part A and Part B Soil Sampling
Facility ID #: 9-08908

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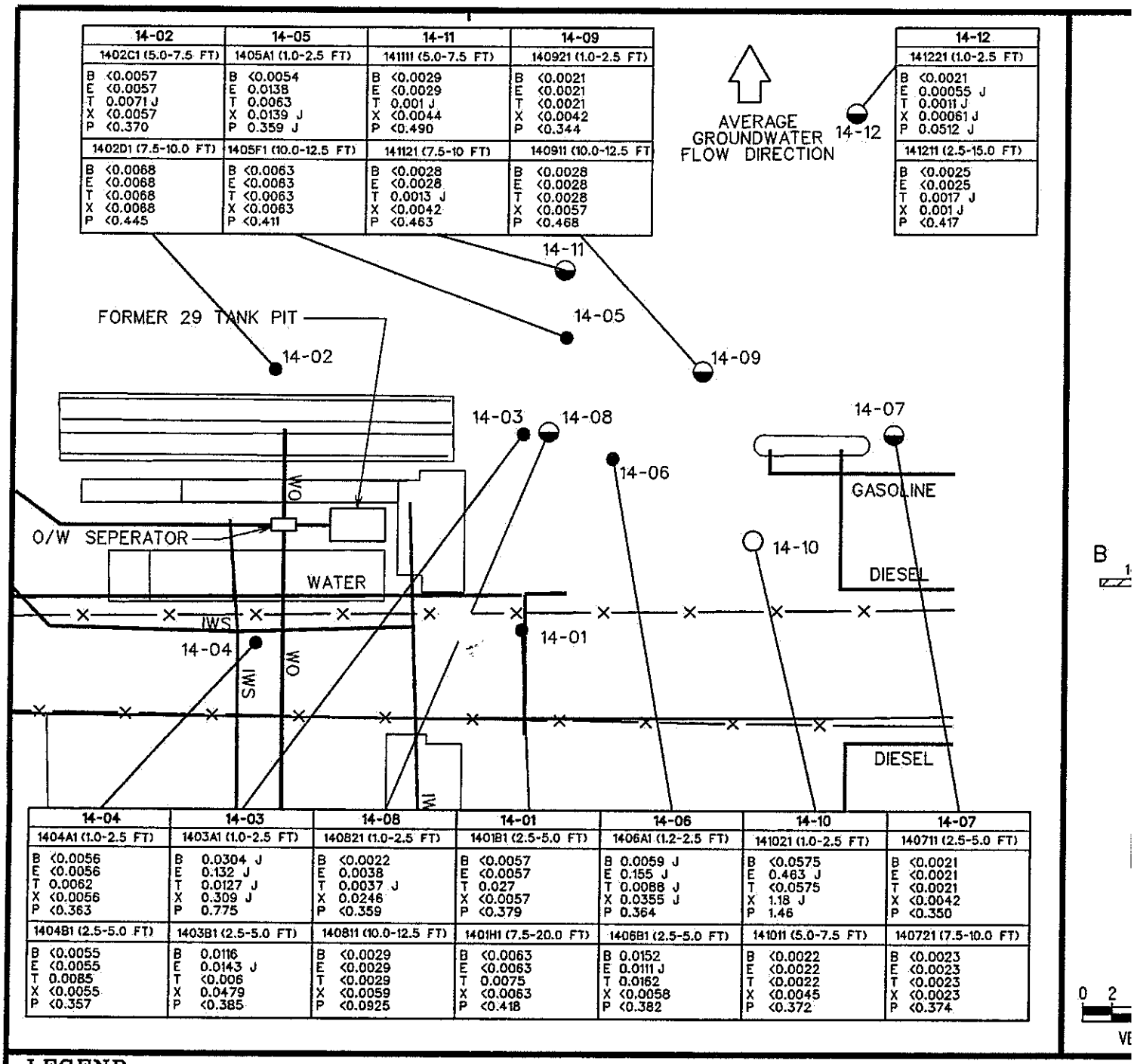

Figure II-4. CAP Part A and Part B Soil Sampling Analyt
Facility ID #: 9-089088

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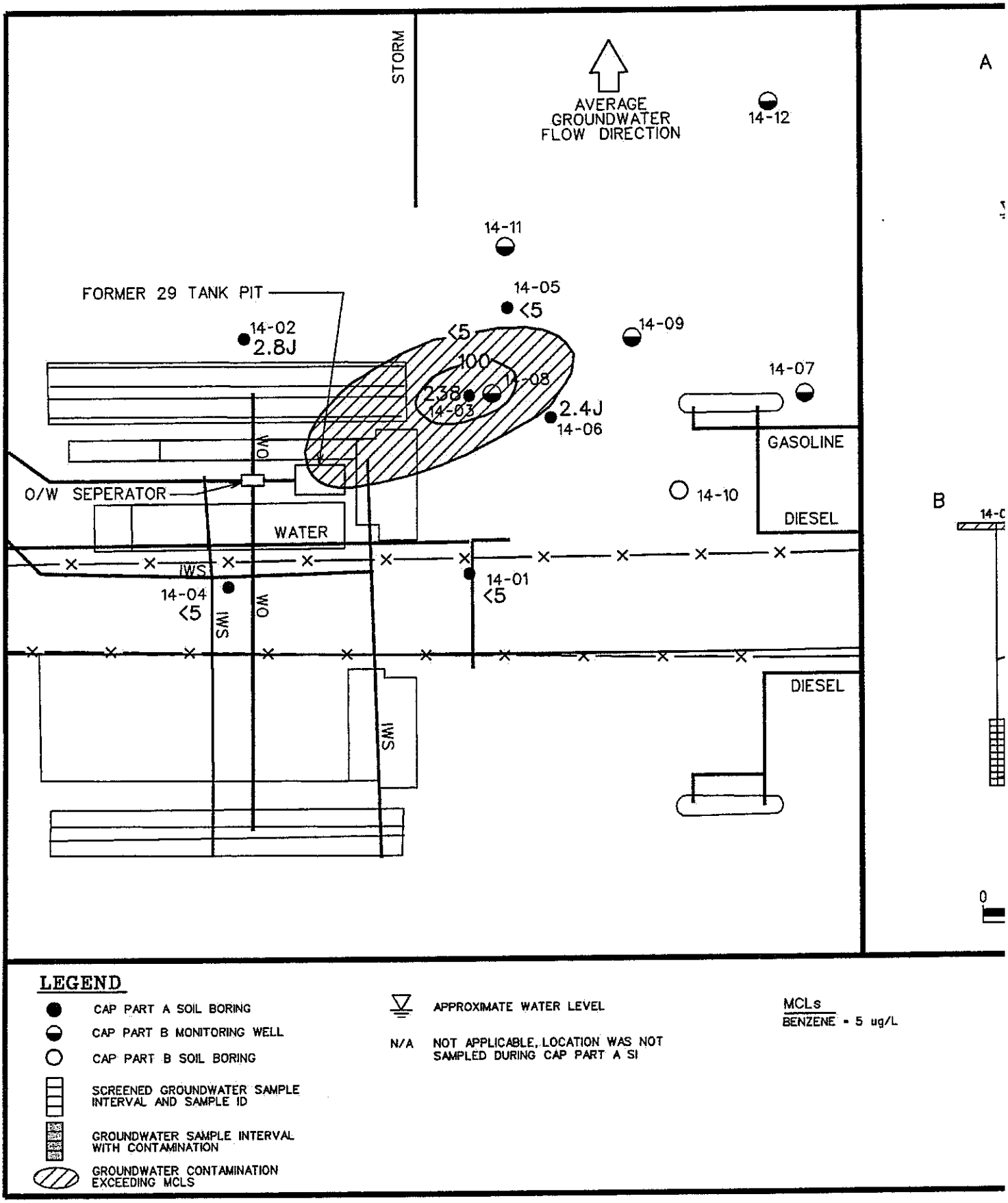

Figure II-5. Benzene Contamination in Gr
Investigation at the UST 2

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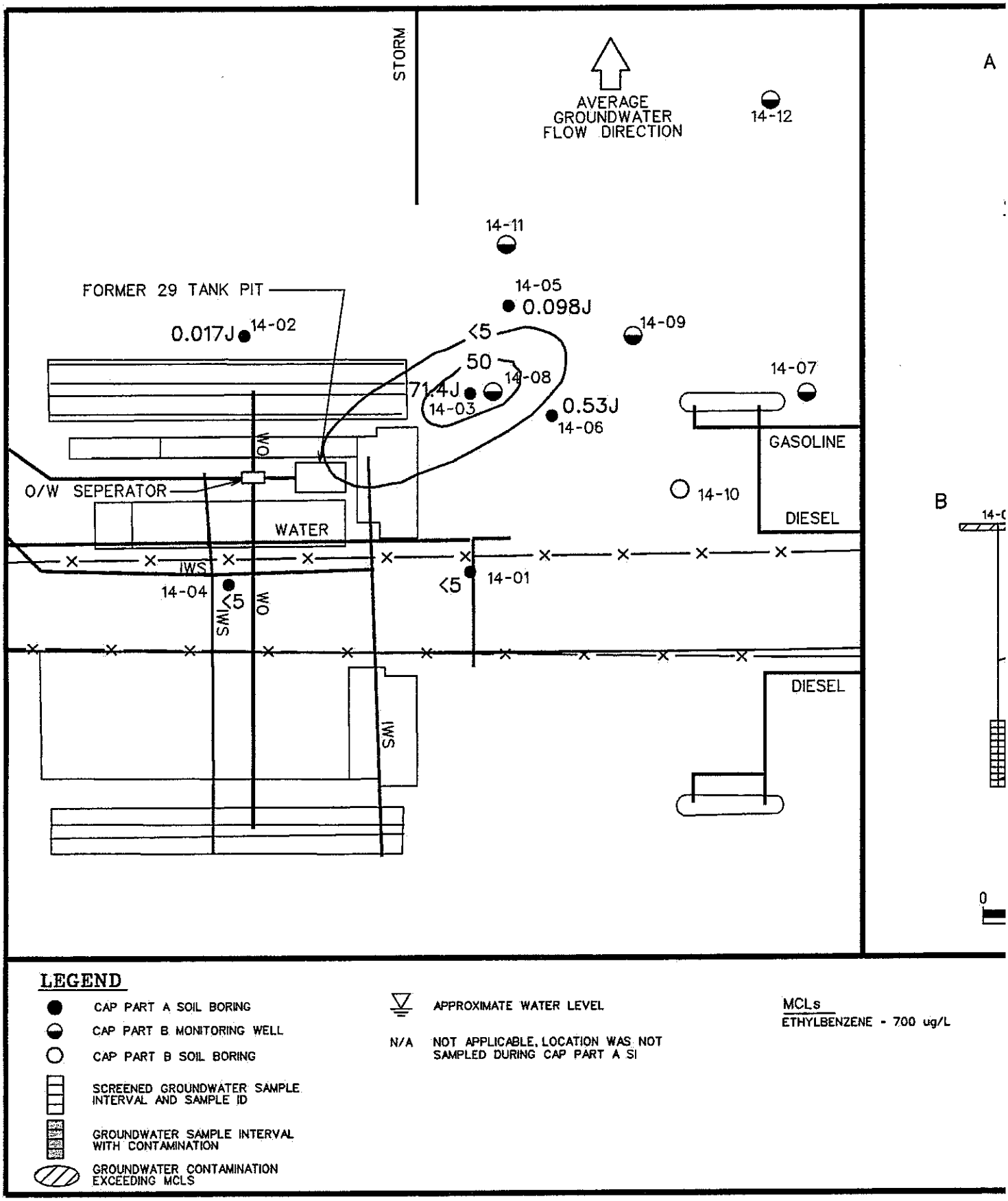

Figure II-6. Ethylbenzene Contamination in Gr
Investigation at the UST 29 S

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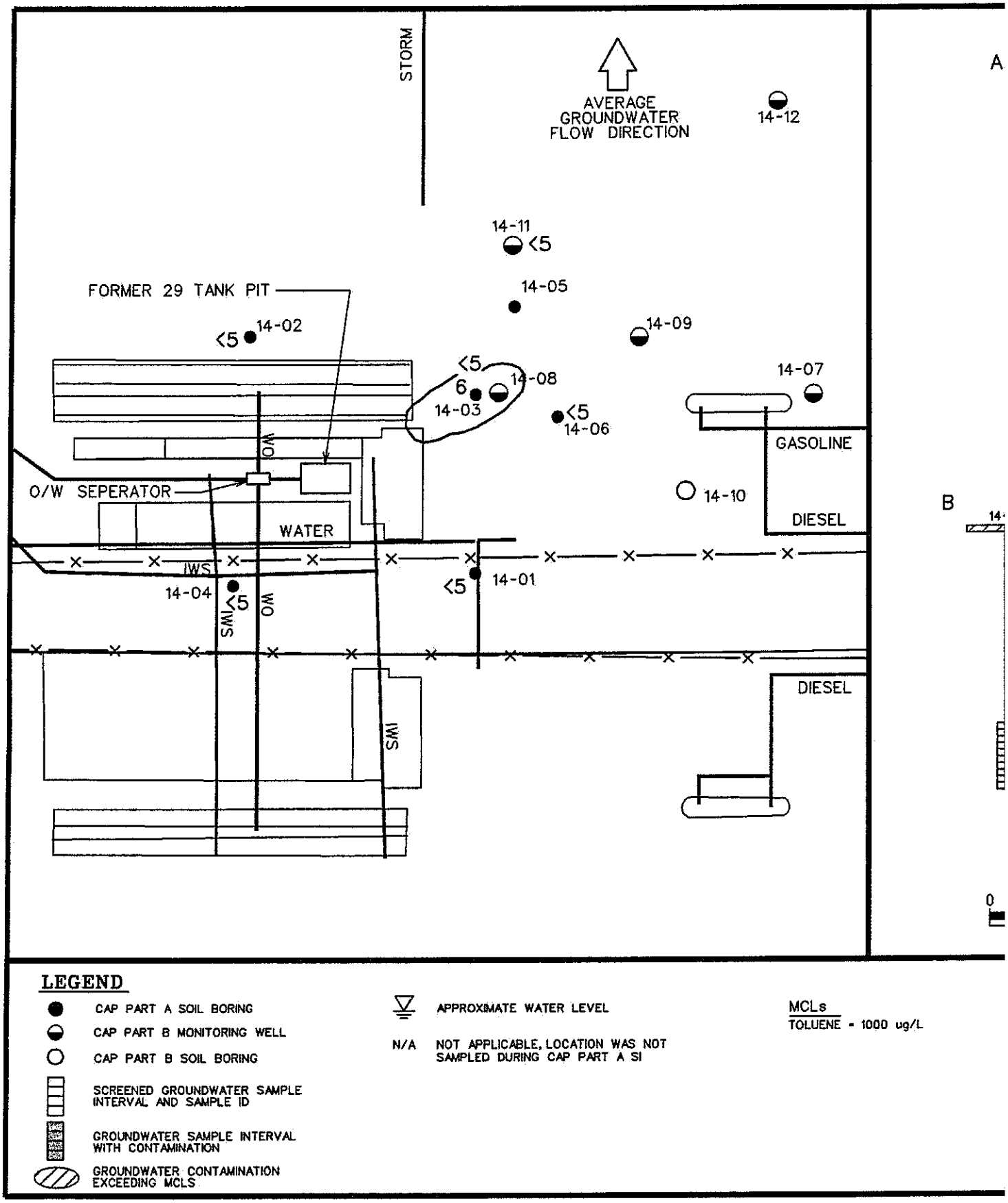

Figure II-7. Toluene Contamination in Grou
Investigation at the UST 29 S

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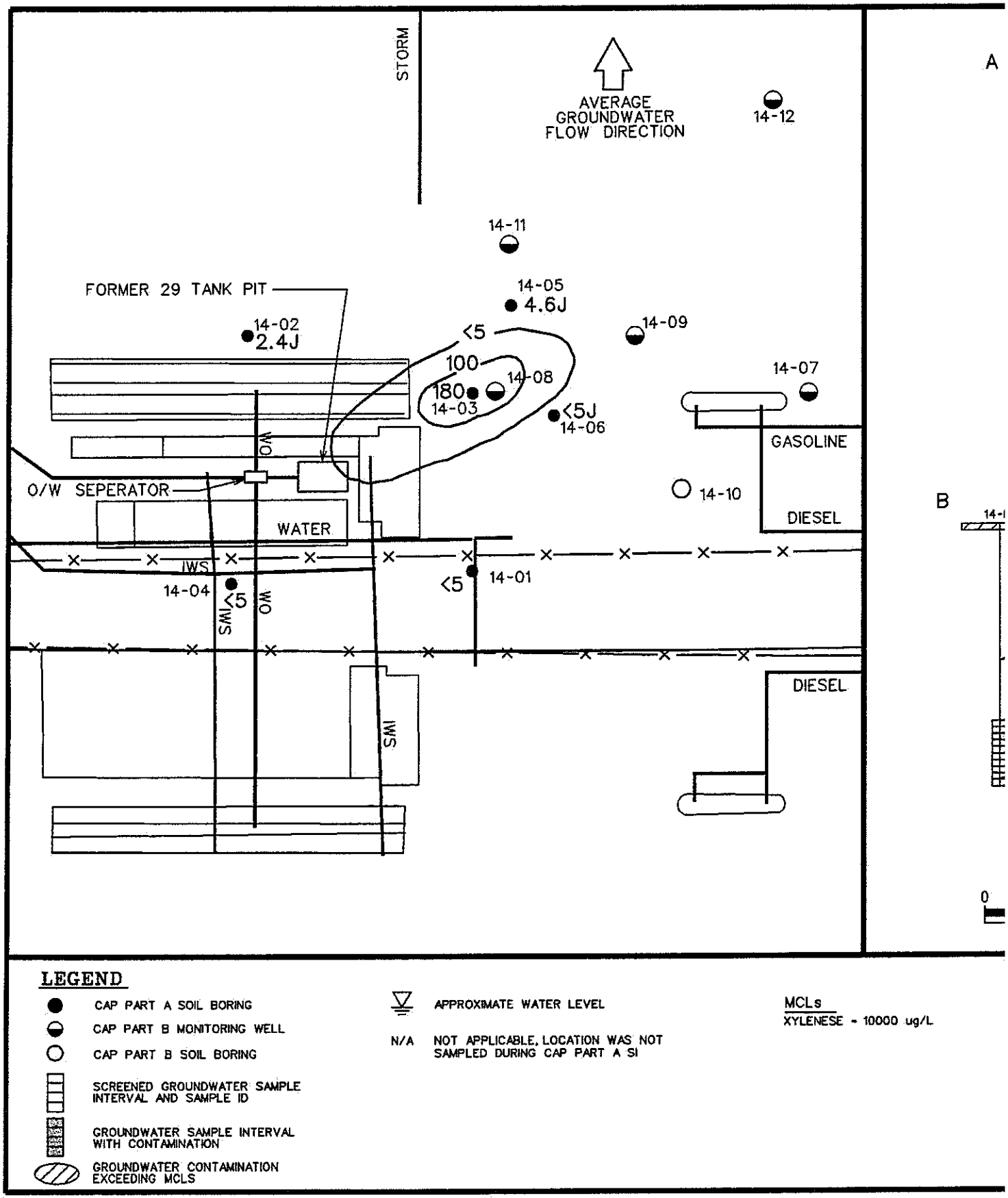

Figure II-8. Total Xylenes Contamination in Grou
Investigation at the UST 29 Site

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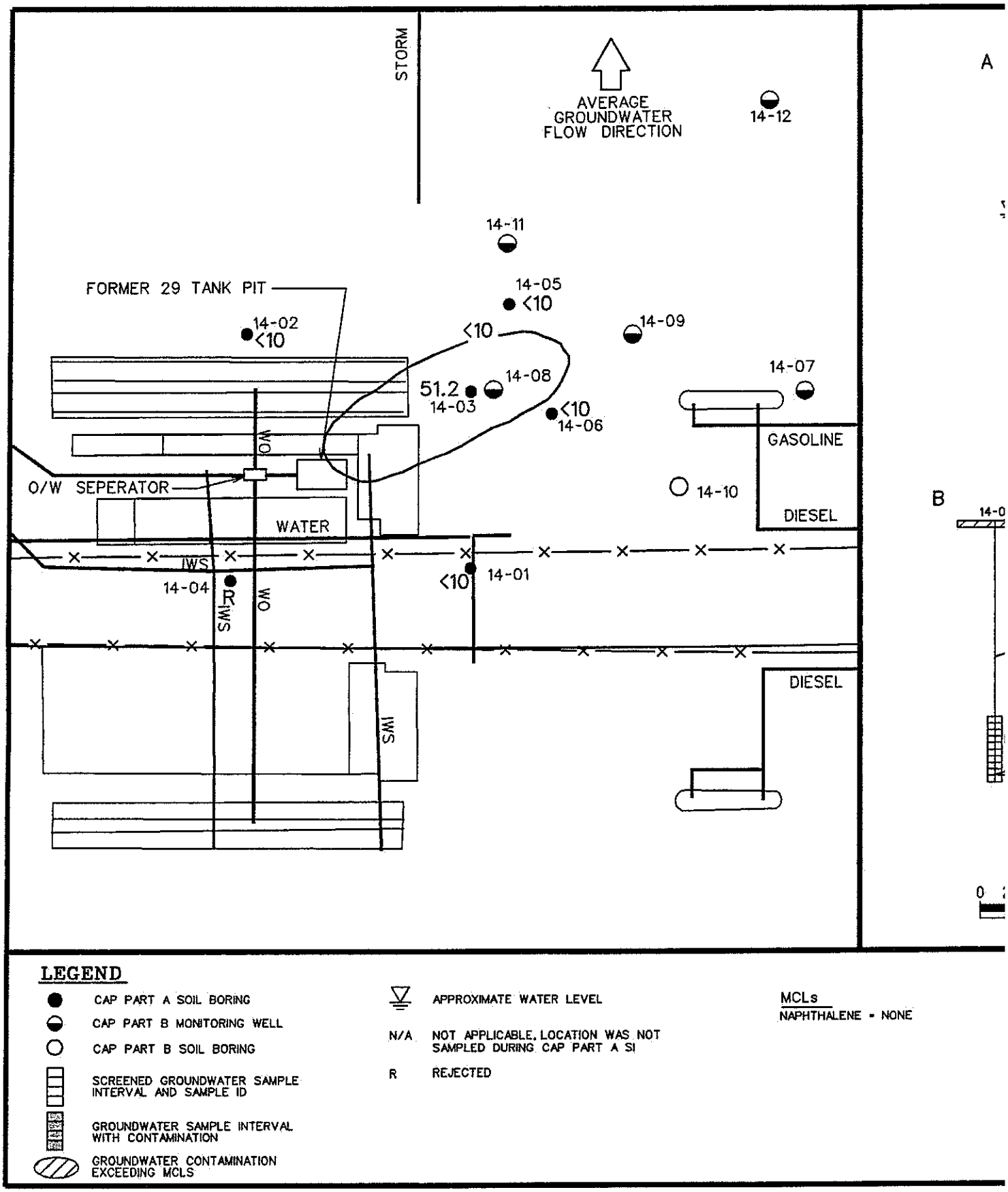

Figure II-9. Naphthalene Contamination in Groundv
Investigation at the UST 29 Site, F

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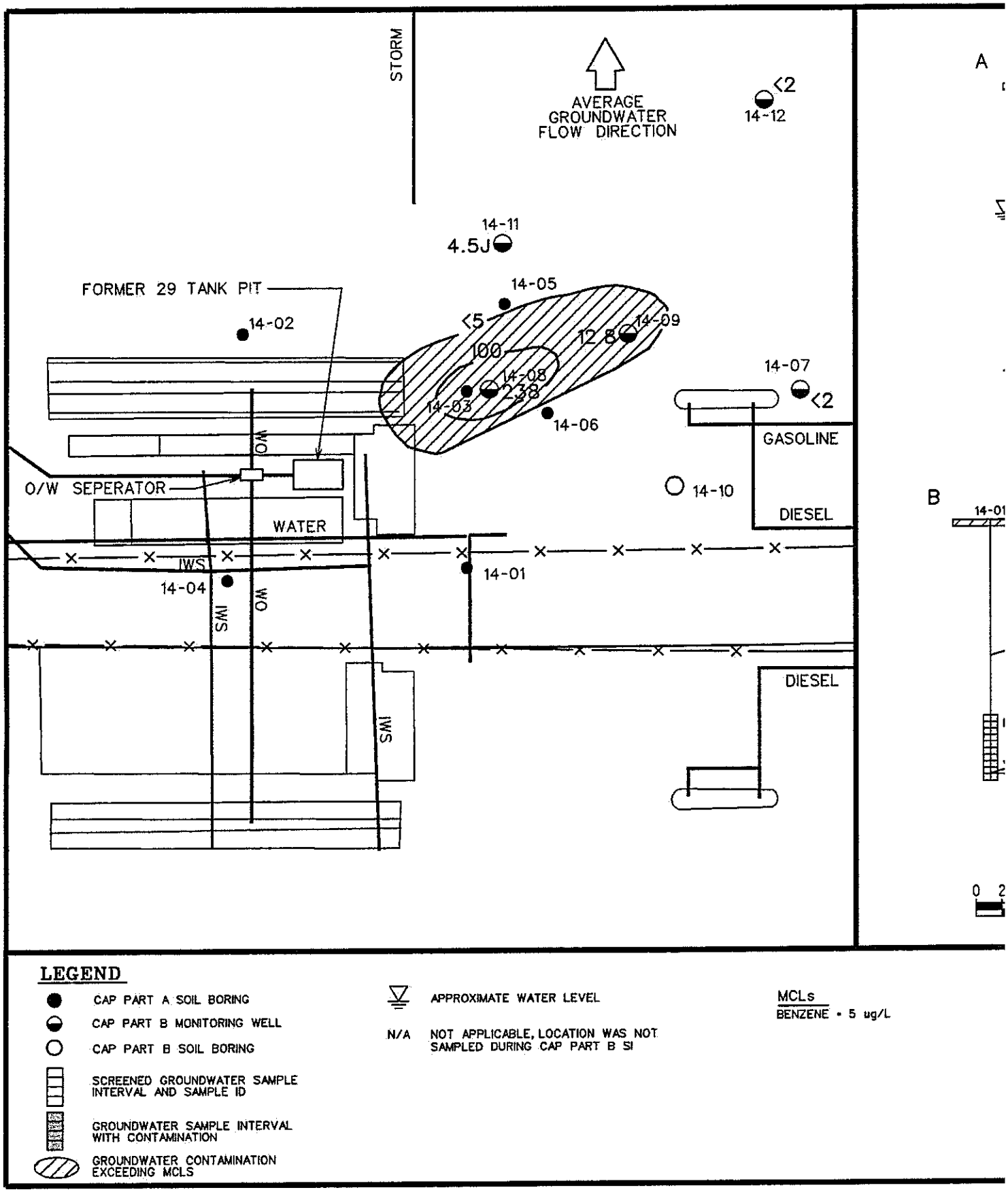

Figure II-10. Benzene Contamination in Groundwa
Investigation at the UST 29 Site, Fa

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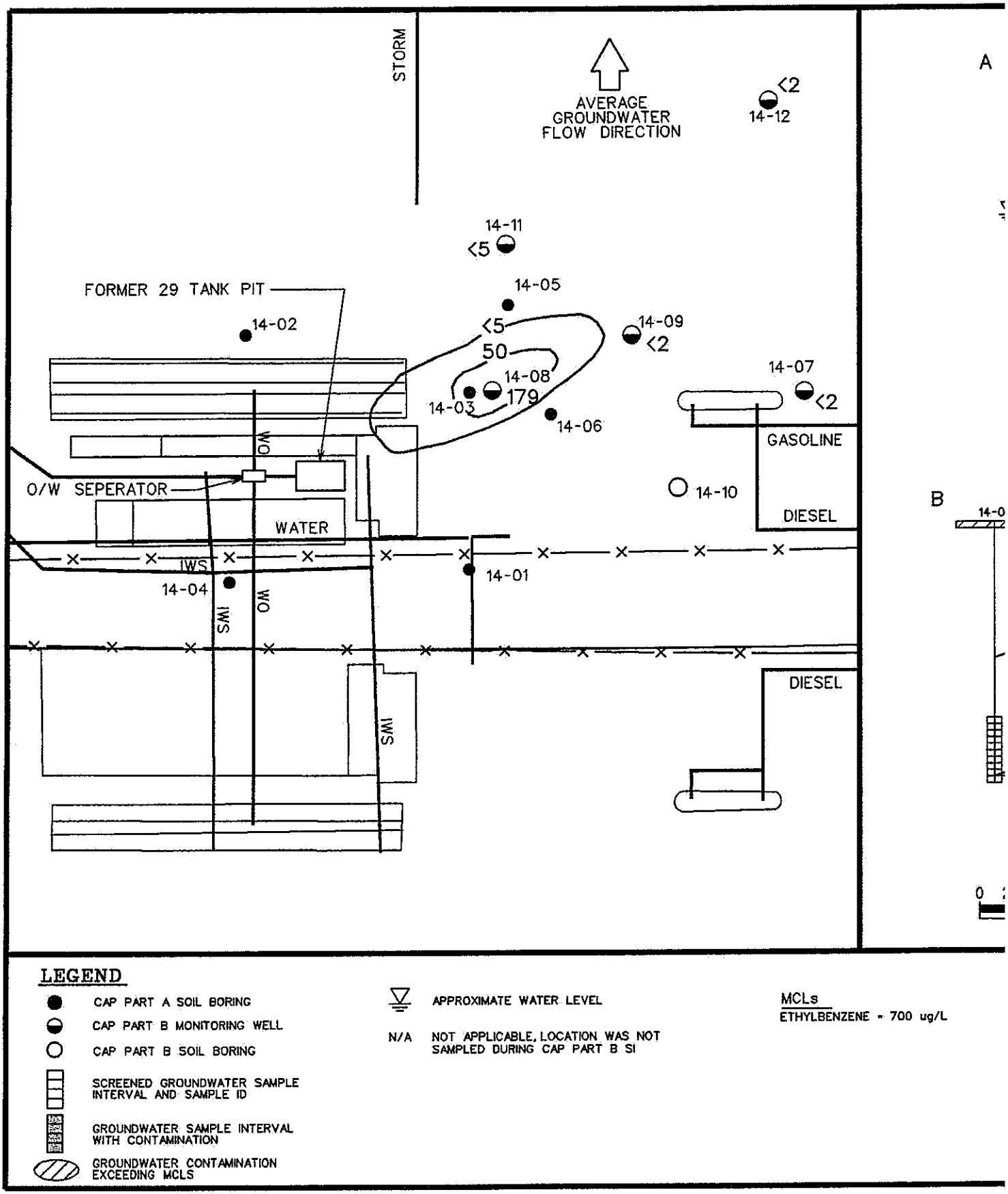

Figure II-11. Ethylbenzene Contamination in Groun
Investigation at the UST 29 Site, F

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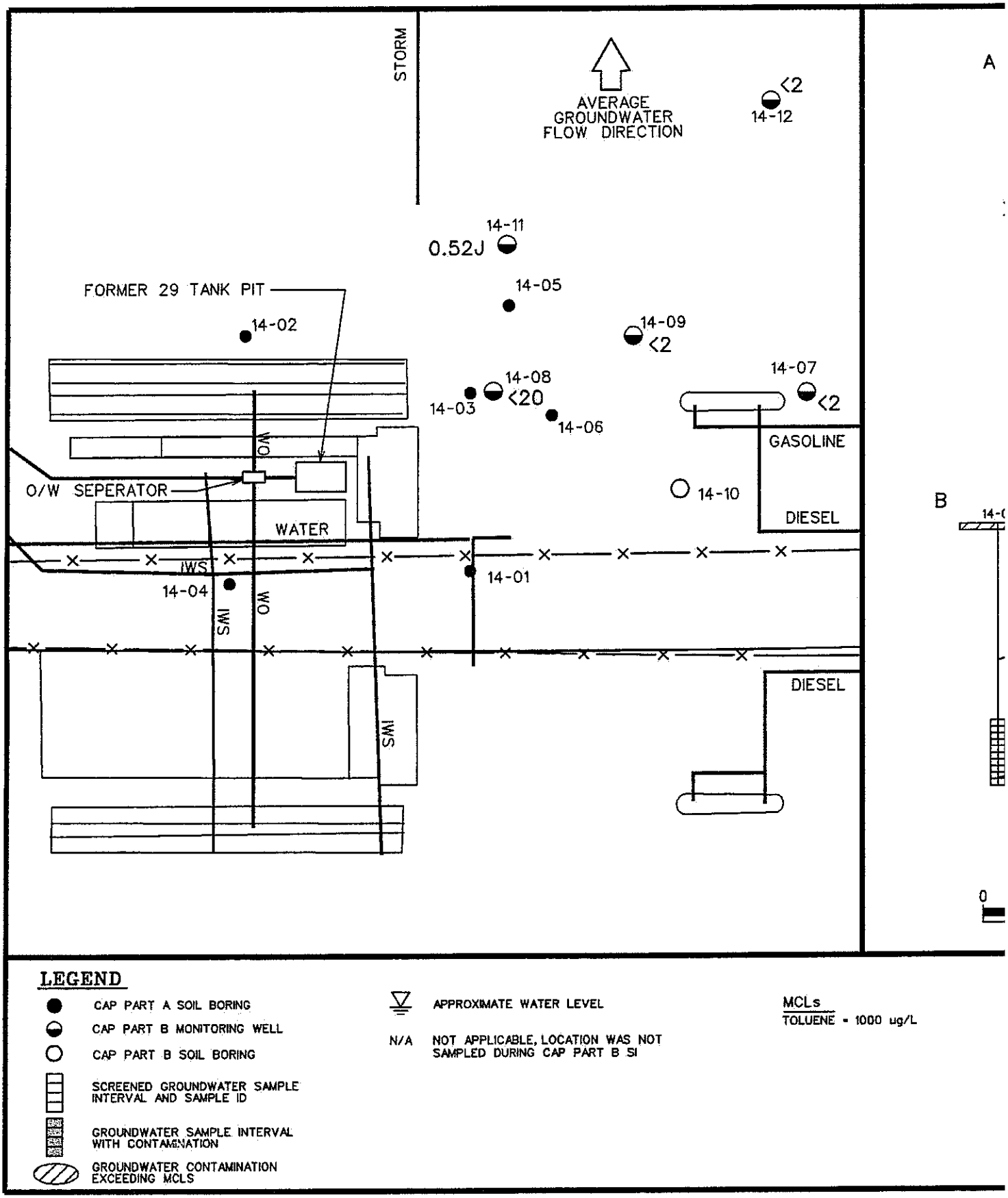

Figure II-12. Toluene Contamination in Gr
Investigation at the UST 29

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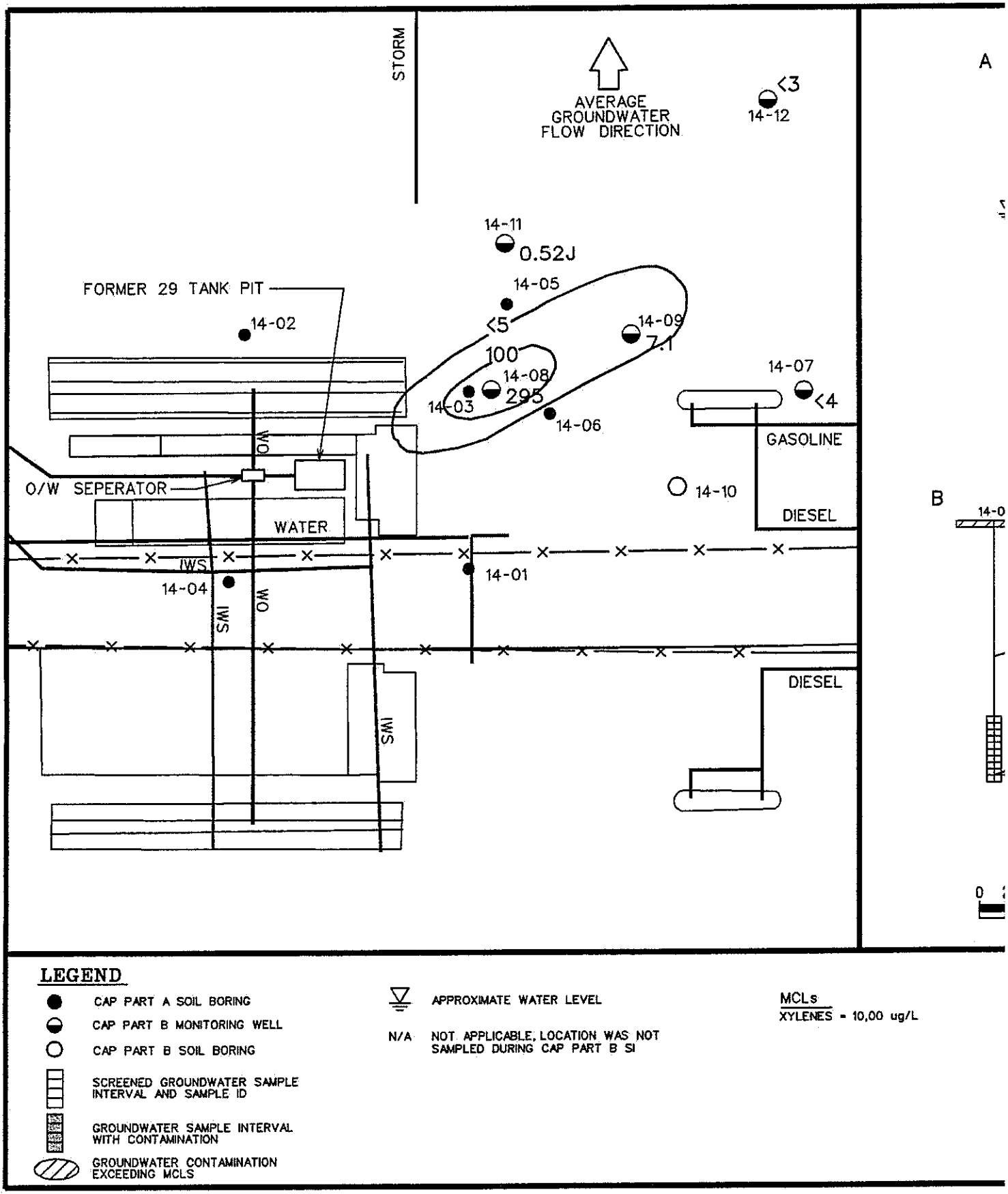

Figure II-13. Total Xylenes Contamination in Grou
Investigation at the UST 29 Site,

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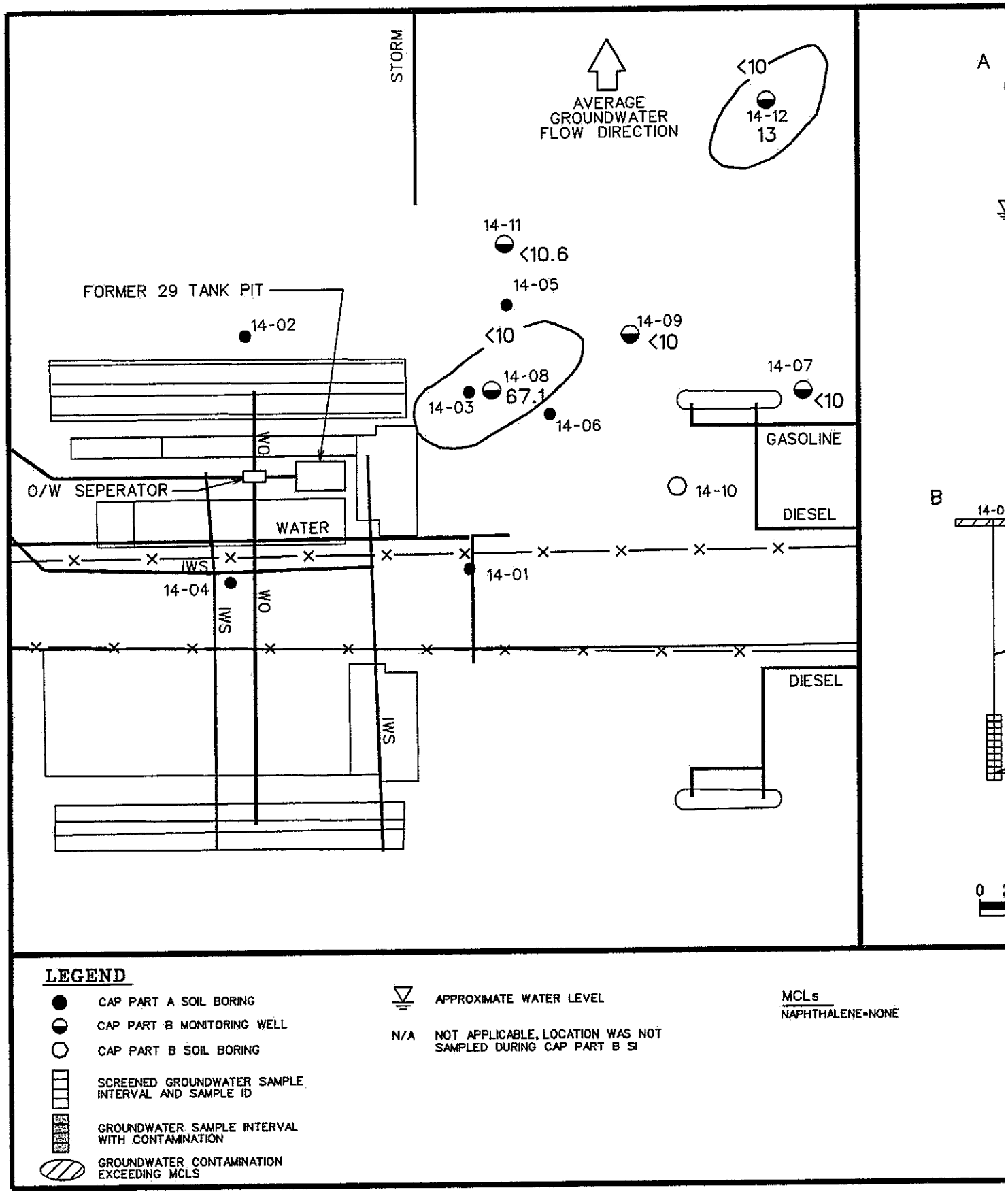

Figure II-14. Naphthalene Contamination in Gr
Investigation at the UST 29 S

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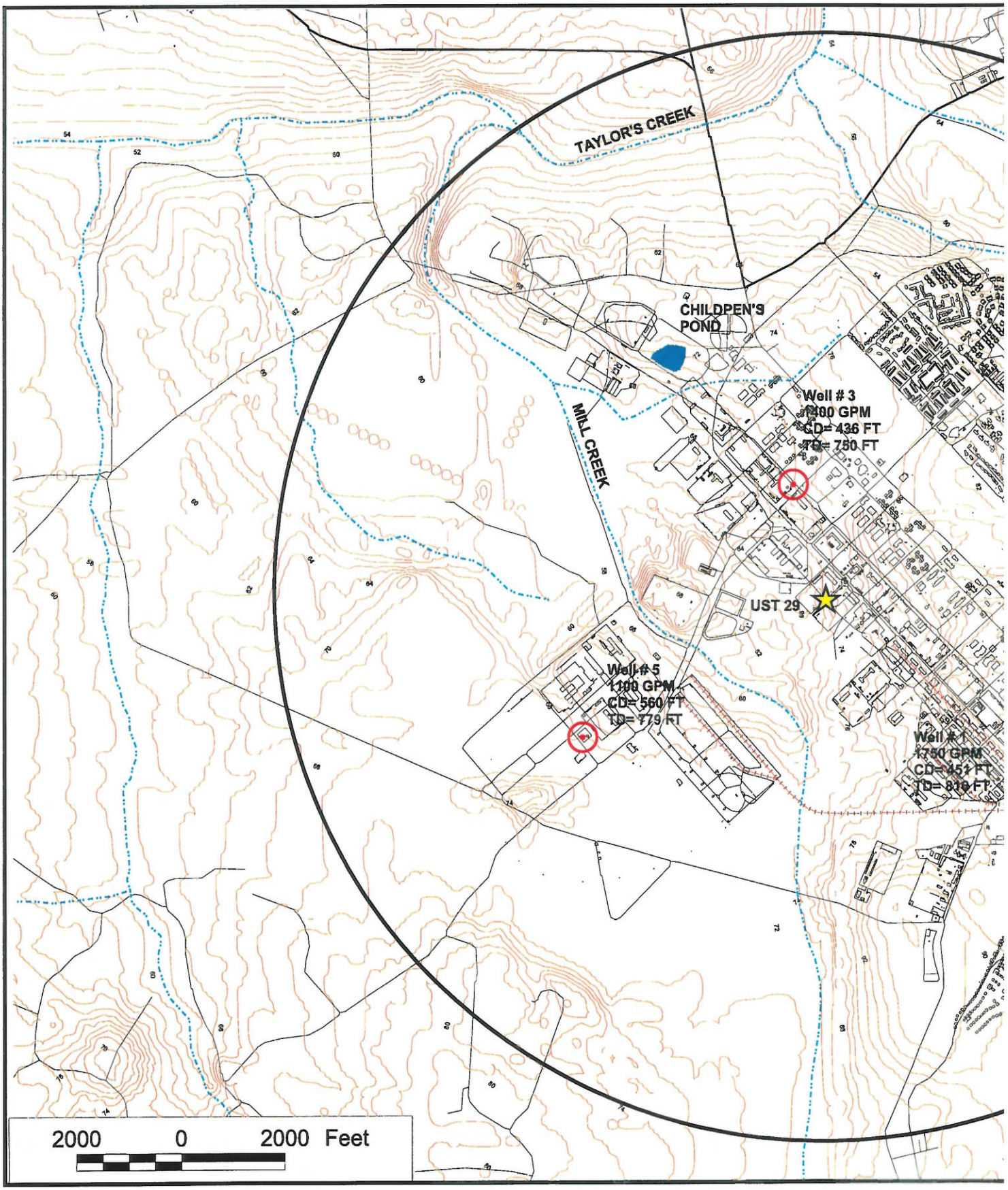

Figure II-15. Locations of Groundwater Supply Wells and Surf
the UST 29 Site, Facility ID #: 9-08

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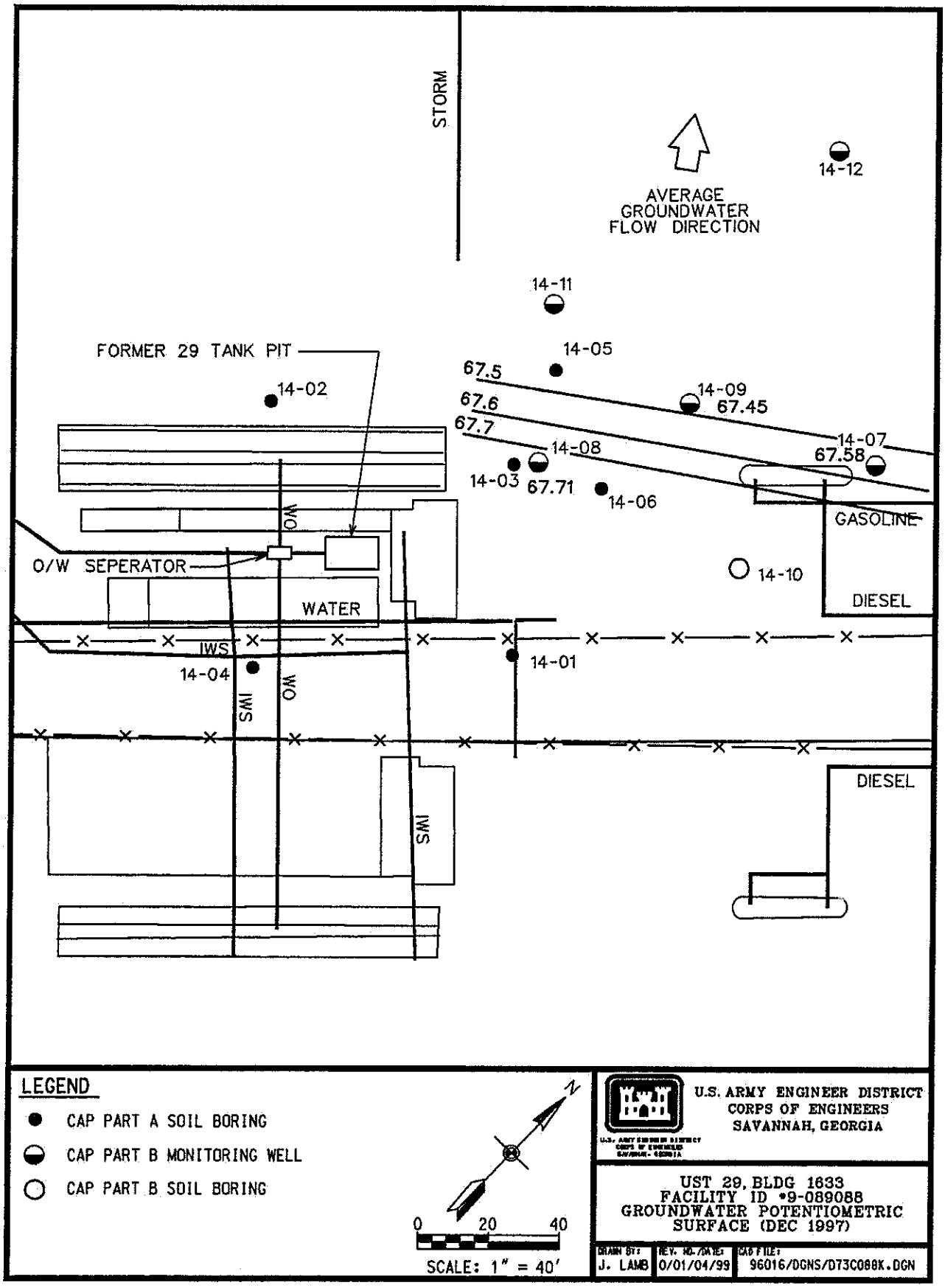

Figure II-16. Groundwater Potentiometric Surface Map (December 1997) for the UST 29 Site, Facility ID #: 9-089088.

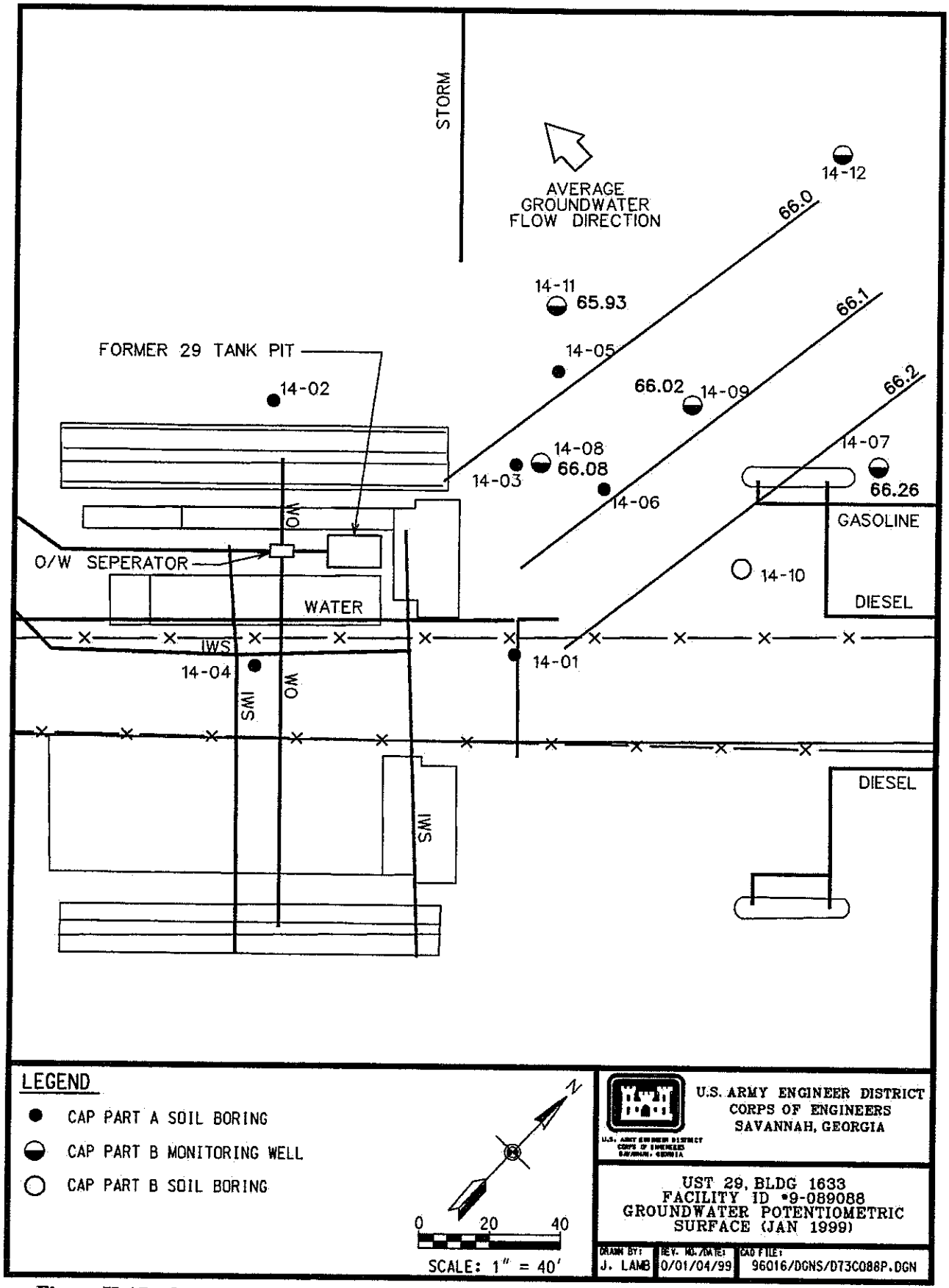

Figure II-17. Groundwater Potentiometric Surface Map (January 1999) for the UST 29 Site, Facility ID #: 9-089088.

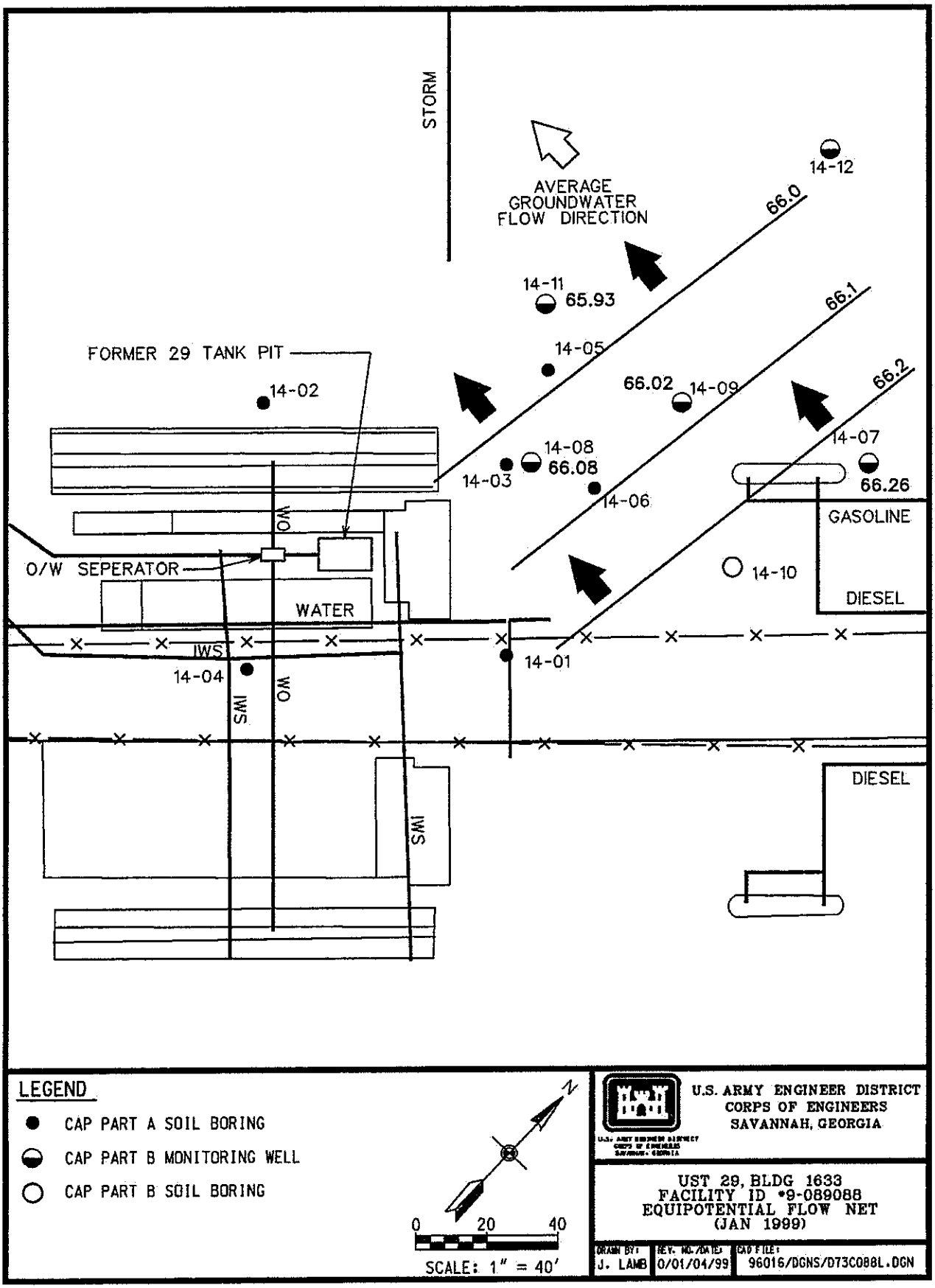

Figure II-18. Equipotential Flow Net (January 1999) for the UST 29 Site, Facility ID #: 9-089088.

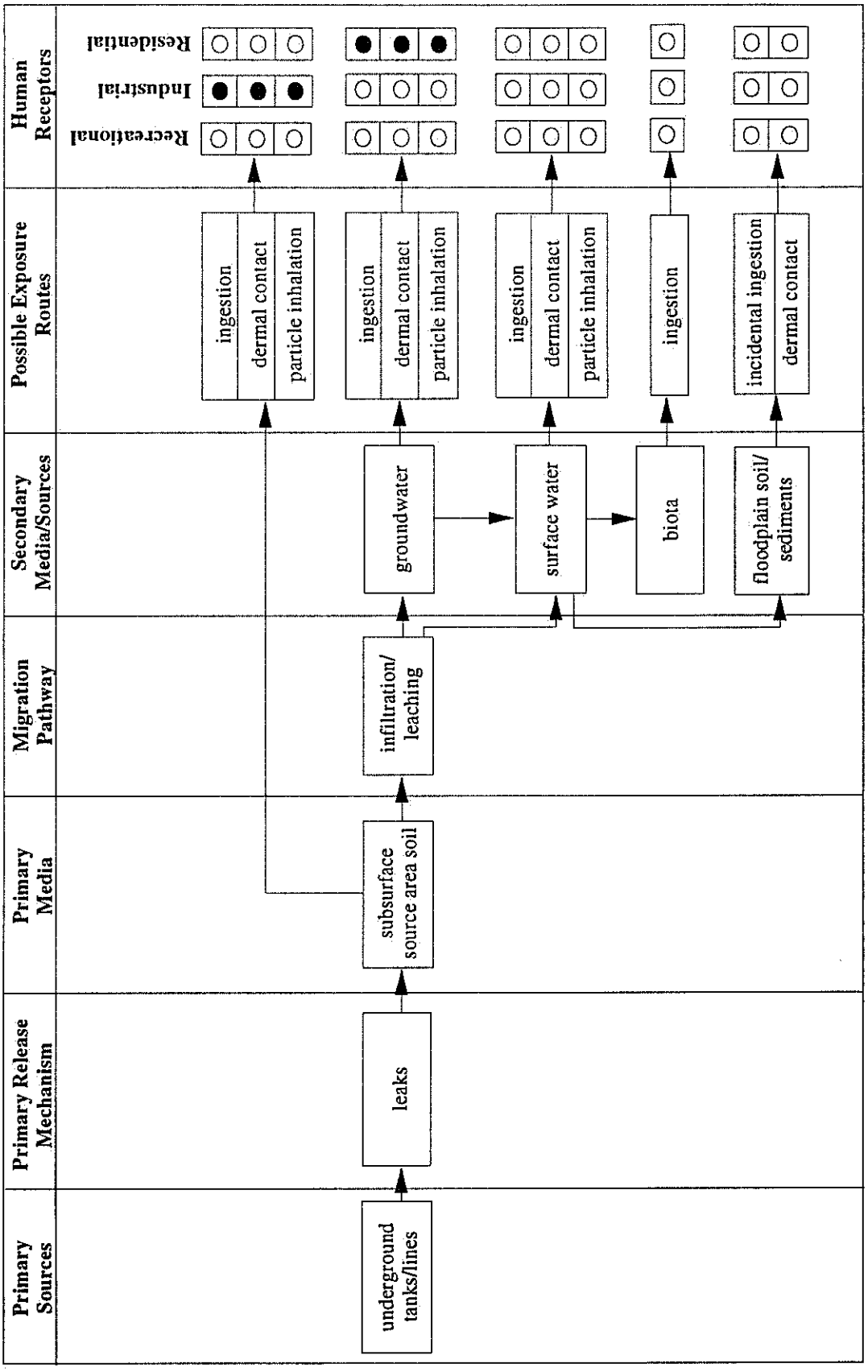

Figure III-1. Conceptual Exposure Model for the UST 29 Site, Facility ID #: 9-089088.

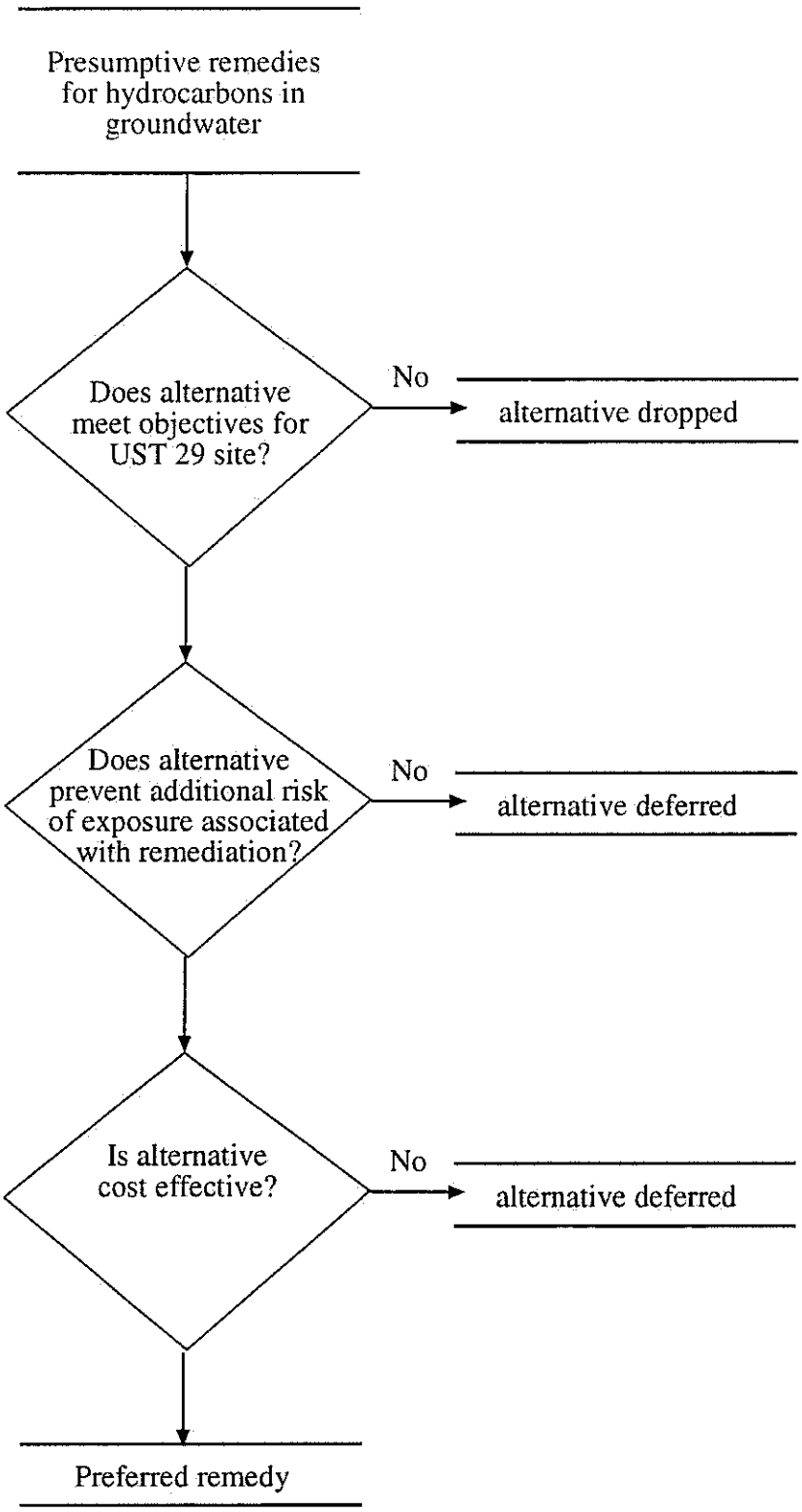

Figure III-2. Remedial Alternatives Selection Process for the UST 29 Site, Facility ID #9-089088

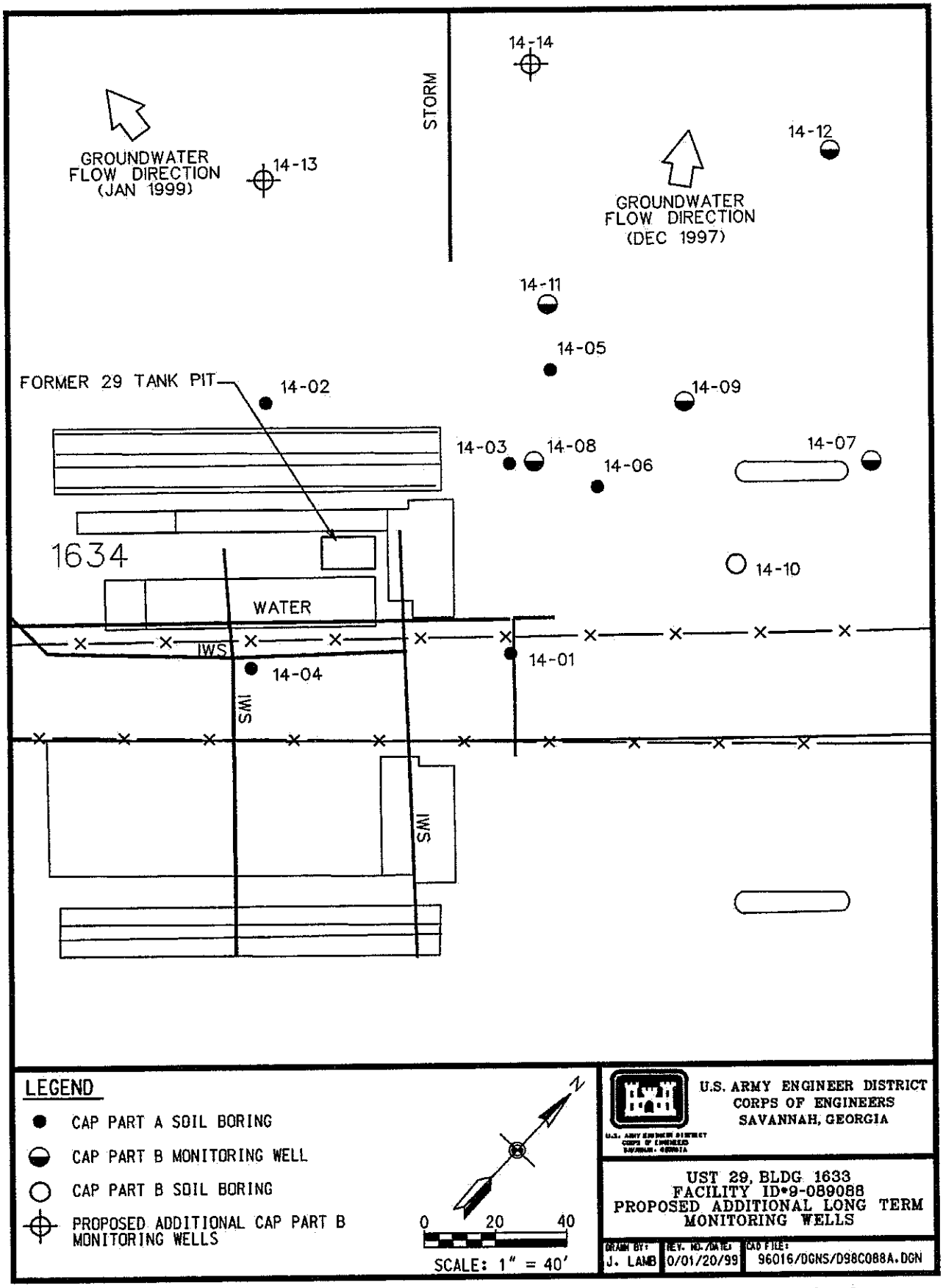

Figure III-3. Proposed Additional Long-term Monitoring Well Locations for the UST 29 Site, Facility ID #: 9-089088.

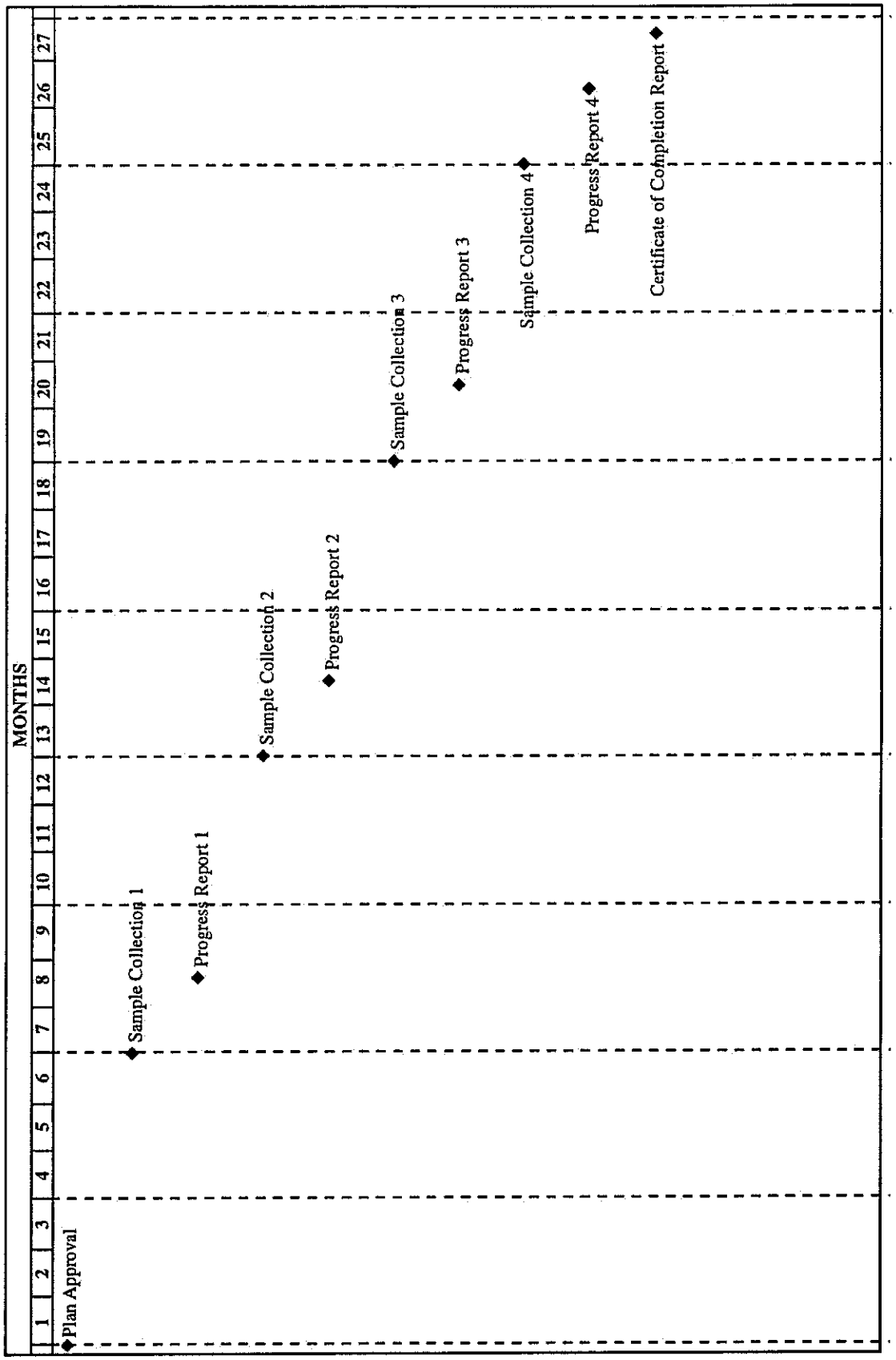

Figure III-4. Remedial Action Milestone Schedule for the UST 29 Site, Facility ID #: 9-089088.

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APPENDIX A

SITE INVESTIGATION LABORATORY ANALYTICAL RESULTS

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FORM 1 Science Applications 17-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

140711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-19

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K1025

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 6 Date Analyzed: 11/25/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.1	U	U
108-88-3	Toluene	2.1	U	U
100-41-4	Ethylbenzene	2.1	U	U CO8
1330-20-7	Xylenes (total)	4.2	U	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-19

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 8X420

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 6 decanted: (Y/N) N Date Extracted:11/28/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/12/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	350	U
91-58-7	2-chloronaphthalene	350	U
208-96-8	acenaphthylene	350	U
83-32-9	acenaphthene	350	U
86-73-7	fluorene	350	U
85-01-8	phenanthrene	350	U
120-12-7	anthracene	350	U
206-44-0	fluoranthene	350	U
129-00-0	pyrene	350	U
56-55-3	benzo(a)anthracene	350	U
218-01-9	chrysene	350	U
205-99-2	benzo(b)fluoranthene	350	U
207-08-9	benzo(k)fluoranthene	350	U
50-32-8	benzo(a)pyrene	350	U
193-39-5	indeno(1,2,3-cd)pyrene	350	U
53-70-3	dibenz(a,h)anthracene	350	U
191-24-2	benzo(g,h,i)perylene	350	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-19

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 2W60030

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 6 decanted: (Y/N) N Date Extracted: 11/26/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/07/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	4.6	B	U F01, F07

FORM 1 Science Applications 17-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

140711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-19

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1K1025

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 6 Date Analyzed: 11/25/97

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics_____	53.2	U	UJ C08

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: CAP-Part A (UST Sites)

cc: SAIC00997 Report Date: December 12, 1997

Sample ID : 140711
Lab ID : 9711552-19
Matrix : Soil
Date Collected : 11/14/97
Date Received : 11/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		6.00		1.00	1.00	wt%	1.0	ERH	11/28/97	1625	112115	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		15.2	U FD1, FD7	2.10	10.6	mg/kg	1.0	JLP	12/02/97	1450	112263	2
TOTAL ORGANIC CARBON (TOC)		1470	=	24.1	100	mg/kg	1.0	MWD	12/06/97	1517	112521	3

The following prep procedures were performed:

GC/MS Base/Neutral Compounds								GWL	11/28/97	2345	112074	1
TRACE								FGD	12/03/97	1230	111987	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
o-Terphenyl	TPH-DRO	90.5	(37.7 - 140.)
n-propylbenzene	BTEX-GC	120.	(51.9 - 133.)
n-propylbenzene	TPH-GRO	74.0	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified
M 3	SW846 9060 modified
M 4	EPA 3050

9711552-19

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FORM 1 Science Applications17-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

140713

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K2012

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 7 Date Analyzed: 11/25/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.2	U	U
108-88-3	Toluene	2.2	U	
100-41-4	Ethylbenzene	2.2	U	
1330-20-7	Xylenes (total)	4.3	U	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140713

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-11

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 8X413

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 7 decanted: (Y/N) N Date Extracted: 11/28/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/11/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	351	U
91-58-7	2-chloronaphthalene	351	U
208-96-8	acenaphthylene	351	U
83-32-9	acenaphthene	351	U
86-73-7	fluorene	351	U
85-01-8	phenanthrene	351	U
120-12-7	anthracene	351	U
206-44-0	fluoranthene	351	U
129-00-0	pyrene	351	U
56-55-3	benzo(a)anthracene	351	U
218-01-9	chrysene	351	U
205-99-2	benzo(b)fluoranthene	351	U
207-08-9	benzo(k)fluoranthene	351	U
50-32-8	benzo(a)pyrene	351	U
193-39-5	indeno(1,2,3-cd)pyrene	351	U
53-70-3	dibenz(a,h)anthracene	351	U
191-24-2	benzo(g,h,i)perylene	351	U

U

FORM I SV-1 OLM03.0

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Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 12, 1997

Sample ID : 140713
Lab ID : 9711552-11
Matrix : Soil
Date Collected : 11/14/97
Date Received : 11/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		7.00		1.00	1.00	wt%	1.0	ERH	11/28/97	1734	112112	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		58.2	=	2.14	10.8	mg/kg	1.0	JLP	12/02/97	1450	112263	2
The following prep procedures were performed:												
GC/MS Base/Neutral Compounds								GWL	11/28/97	2345	112074	1

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	96.3	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

FORM 1 Science Applications17-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

140721

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-14

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K707

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 13 Date Analyzed: 11/30/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.3	U
108-88-3	Toluene	2.3	U
100-41-4	Ethylbenzene	2.3	U
1330-20-7	Xylenes (total)	4.6	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140721

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ES2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-14

Sample wt/vol: 30.7 (g/mL) G Lab File ID: 8X416

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 13 decanted: (Y/N) N Date Extracted: 11/28/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/11/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	374	U
91-58-7	2-chloronaphthalene	374	U
208-96-8	acenaphthylene	374	U
83-32-9	acenaphthene	374	U
86-73-7	fluorene	374	U
85-01-8	phenanthrene	374	U
120-12-7	anthracene	374	U
206-44-0	fluoranthene	374	U
129-00-0	pyrene	374	U
56-55-3	benzo(a)anthracene	374	U
218-01-9	chrysene	374	U
205-99-2	benzo(b)fluoranthene	374	U
207-08-9	benzo(k)fluoranthene	374	U
50-32-8	benzo(a)pyrene	374	U
193-39-5	indeno(1,2,3-cd)pyrene	374	U
53-70-3	dibenz(a,h)anthracene	374	U
191-24-2	benzo(g,h,i)perylene	374	U

U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

140721

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_ SDG No.: FS2012S

Lab Code: _____ Case No.: _____ SAS No.: _____ Lab Sample ID: 9711552-14

Matrix (soil/water): SOIL_ Date Received: 11/17/97

Level (low/med): LOW__

% Solids: _87.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7439-92-1	Lead	3.2			P	=

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 12, 1997

Sample ID : 140721
Lab ID : 9711552-14
Matrix : Soil
Date Collected : 11/14/97
Date Received : 11/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		13.0		1.00	1.00	wt%	1.0	ERH	11/28/97	1625	112115	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		35.5	U F01, F07	2.28	11.5	mg/kg	1.0	JLP	12/02/97	1450	112263	2
TOTAL ORGANIC CARBON (TOC)		3360	=	24.1	100	mg/kg	1.0	MWD	12/06/97	1436	112521	3
The following prep procedures were performed:												
GC/MS Base/Neutral Compounds								GWL	11/28/97	2345	112074	1
TRACE								FGD	12/03/97	1230	111987	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	98.0	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified
M 3	SW846 9060 modified
M 4	EPA 3050

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VOLATILE ORGANICS ANALYSIS DATA SHEET

140811

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-16

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K1022

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 32 Date Analyzed: 11/24/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.9	U	U
108-88-3	Toluene	2.9	U	U
100-41-4	Ethylbenzene	2.9	U	U5 CP8
1330-20-7	Xylenes (total)	5.9	U	U

DATA VALIDATION COPY

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140811

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-16

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 8X418

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 32 decanted: (Y/N) N Date Extracted: 11/28/97

Concentrated Extract Volume: 0.19(mL) Date Analyzed: 12/12/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	92.5	U
91-58-7	2-chloronaphthalene	92.5	U
208-96-8	acenaphthylene	92.5	U
83-32-9	acenaphthene	92.5	U
86-73-7	fluorene	92.5	U
85-01-8	phenanthrene	92.5	U
120-12-7	anthracene	92.5	U
206-44-0	fluoranthene	92.5	U
129-00-0	pyrene	92.5	U
56-55-3	benzo(a)anthracene	92.5	U
218-01-9	chrysene	92.5	U
205-99-2	benzo(b)fluoranthene	92.5	U
207-08-9	benzo(k)fluoranthene	92.5	U
50-32-8	benzo(a)pyrene	92.5	U
193-39-5	indeno(1,2,3-cd)pyrene	92.5	U
53-70-3	dibenz(a,h)anthracene	92.5	U
191-24-2	benzo(g,h,i)perylene	92.5	U

U

DATA VALI...
COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 12, 1997

Sample ID : 140811
Lab ID : 9711552-16
Matrix : Soil
Date Collected : 11/14/97
Date Received : 11/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
Evaporative Loss @ 105 C		32.0	1.00	1.00	wt%	1.0	ERH	11/28/97	1625	112115	1
General Chemistry											
TOTAL REC. PETRO. HYDROCARBONS		3.35 U F01,F06	2.91	14.7	mg/kg	1.0	JLP	12/02/97	1450	112263	2
The following prep procedures were performed:											
GC/MS Base/Neutral Compounds							GWL	11/28/97	2345	112074	1

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	122.	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

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VOLATILE ORGANICS ANALYSIS DATA SHEET

140821

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2013S

Matrix: (soil/water) SOIL Lab Sample ID: 9711547-03

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K206

Level: (low/med) LOW DATA VALIDATION COPY Date Received: 11/17/97

% Moisture: not dec. 9 Date Analyzed: 11/25/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.2	U
108-88-3	Toluene	3.7	P
100-41-4	Ethylbenzene	3.8	
1330-20-7	Xylenes (total)	24.6	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140821

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2013S

Matrix: (soil/water) SOIL Lab Sample ID: 9711547-03

Sample wt/vol: 30.6 (g/mL) G Lab File ID: 8Y211

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 9 decanted: (Y/N) N Date Extracted: 11/28/97

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 12/16/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	359	U
91-58-7	2-chloronaphthalene	359	U
208-96-8	acenaphthylene	359	U
83-32-9	acenaphthene	359	U
86-73-7	fluorene	359	U
85-01-8	phenanthrene	359	U
120-12-7	anthracene	359	U
206-44-0	fluoranthene	359	U
129-00-0	pyrene	359	U
56-55-3	benzo(a)anthracene	359	U
218-01-9	chrysene	359	U
205-99-2	benzo(b)fluoranthene	359	U
207-08-9	benzo(k)fluoranthene	359	U
50-32-8	benzo(a)pyrene	359	U
193-39-5	indeno(1,2,3-cd)pyrene	359	U
53-70-3	dibenz(a,h)anthracene	359	U
191-24-2	benzo(g,h,i)perylene	359	U

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3/12/98

FORM 1 Science Applications17-NOV 1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

140911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-07

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K208

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 30 Date Analyzed: 11/25/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.8	U	U
108-88-3	Toluene	2.8	U	
100-41-4	Ethylbenzene	2.8	U	
1330-20-7	Xylenes (total)	5.7	U	

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

140911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-07

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 8X409

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 30 decanted: (Y/N) N Date Extracted:11/28/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/11/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	468	U
91-58-7	2-chloronaphthalene	468	U
208-96-8	acenaphthylene	468	U
83-32-9	acenaphthene	468	U
86-73-7	fluorene	468	U
85-01-8	phenanthrene	468	U
120-12-7	anthracene	468	U
206-44-0	fluoranthene	468	U
129-00-0	pyrene	468	U
56-55-3	benzo(a)anthracene	468	U
218-01-9	chrysene	468	U
205-99-2	benzo(b)fluoranthene	468	U
207-08-9	benzo(k)fluoranthene	468	U
50-32-8	benzo(a)pyrene	468	U
193-39-5	indeno(1,2,3-cd)pyrene	468	U
53-70-3	dibenz(a,h)anthracene	468	U
191-24-2	benzo(g,h,i)perylene	468	U

U

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 12, 1997

Sample ID	: 140911
Lab ID	: 9711552-07
Matrix	: Soil
Date Collected	: 11/14/97
Date Received	: 11/17/97
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
Evaporative Loss @ 105 C		30.0	1.00	1.00	wt%	1.0	ERH	11/28/97	1734	112112	1
General Chemistry											
TOTAL REC. PETRO. HYDROCARBONS		36.5 U F01,F07	2.83	14.3	mg/kg	1.0	JLP	12/01/97	1300	112201	2

The following prep procedures were performed:

GC/MS Base/Neutral Compounds							GWL	11/28/97	2345	112074	1

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	102.	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

9711552-07

VOLATILE ORGANICS ANALYSIS DATA SHEET

140921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2013S

Matrix: (soil/water) SOIL Lab Sample ID: 9711547-12

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K307

Level: (low/med) LOW DATA VALIDATION COPY Date Received: 11/17/97

% Moisture: not dec. 4 Date Analyzed: 11/24/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.1	U
108-88-3	Toluene	2.1	U
100-41-4	Ethylbenzene	2.1	U
1330-20-7	Xylenes (total)	4.2	U

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SEMIVOLATILE ORGANICS 1B ANALYSIS DATA SHEET

EPA SAMPLE NO.

140921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2013S

Matrix: (soil/water) SOIL Lab Sample ID: 9711547-12

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 8Y220

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 4 decanted: (Y/N) N Date Extracted: 11/28/97

Concentrated Extract Volume: 1.00 (mL) Date Analyzed: 12/16/97

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	344	U
91-58-7	2-chloronaphthalene	344	U
208-96-8	acenaphthylene	344	U
83-32-9	acenaphthene	344	U
86-73-7	fluorene	344	U
85-01-8	phenanthrene	344	U
120-12-7	anthracene	344	U
206-44-0	fluoranthene	344	U
129-00-0	pyrene	344	U
56-55-3	benzo(a)anthracene	344	U
218-01-9	chrysene	344	U
205-99-2	benzo(b)fluoranthene	344	U
207-08-9	benzo(k)fluoranthene	344	U
50-32-8	benzo(a)pyrene	344	U
193-39-5	indeno(1,2,3-cd)pyrene	344	U
53-70-3	dibenz(a,h)anthracene	344	U
191-24-2	benzo(g,h,i)perylene	344	U

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FORM I SV-1

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

140921

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_ SDG No.: FS2013S
Lab Code: _____ Case No.: _____ SAS No.: _____ Lab Sample ID: 9711547-12
Matrix (soil/water): SOIL_ Date Received: 11/17/97
Level (low/med): LOW__
% Solids: _96.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	1.5			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

_____

1155

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097

Report Date: December 20, 1997

Sample ID	: 140921
Lab ID	: 9711547-12
Matrix	: Soil
Date Collected	: 11/14/97
Date Received	: 11/17/97
Priority	: Routine
Collector	: Client

mcl 3/12/98

Parameter	Qualifier	Result	17.5	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		17.5	U F01, F07	2.06	10.4	mg/kg	1.0	JLP	12/01/97	1300	112201	1
TOTAL ORGANIC CARBON (TOC)		1720		24.1	100	mg/kg	1.0	MWD	12/05/97	1647	112521	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	111.	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 418.1 Modified
M 2	SW846 9060 modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

FORM 1 Science Applications17-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

141011

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-20

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K1026

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 11 Date Analyzed: 11/25/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	2.2	U	U
108-88-3	Toluene	2.2	U	U
100-41-4	Ethylbenzene	2.2	U	UJ CP8
1330-20-7	Xylenes (total)	4.5	U	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

141011

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-20

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 8X421

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 11 decanted: (Y/N) N Date Extracted:11/28/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/12/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	372	U
91-58-7	2-chloronaphthalene	372	U
208-96-8	acenaphthylene	372	U
83-32-9	acenaphthene	372	U
86-73-7	fluorene	372	U
85-01-8	phenanthrene	372	U
120-12-7	anthracene	372	U
206-44-0	fluoranthene	372	U
129-00-0	pyrene	372	U
56-55-3	benzo(a)anthracene	372	U
218-01-9	chrysene	372	U
205-99-2	benzo(b)fluoranthene	372	U
207-08-9	benzo(k)fluoranthene	372	U
50-32-8	benzo(a)pyrene	372	U
193-39-5	indeno(1,2,3-cd)pyrene	372	U
53-70-3	dibenz(a,h)anthracene	372	U
191-24-2	benzo(g,h,i)perylene	372	U

U

LB

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141011DL

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-20

Sample wt/vol: 30.5 (g/mL) G Lab File ID: 2W60052

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 11 decanted: (Y/N) N Date Extracted: 11/26/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/08/97

Injection Volume: 1.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
	----------Diesel Range Organics	33.9	DB	= FOB

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FORM I SV-1 OLM03.0

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FORM 1 Science Applications17-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

141011

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-20

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 1K1026

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 11 Date Analyzed: 11/25/97

GC Column: J&W DB-624(FID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
	----------Gasoline Range Organics_____	56.2	U	UJ CPB

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Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: CAP-Part A (UST Sites)

cc: SAIC00997 Report Date: December 12, 1997

Sample ID : 141011
Lab ID : 9711552-20
Matrix : Soil
Date Collected : 11/14/97
Date Received : 11/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		11.0		1.00	1.00	wt%	1.0	ERH	11/28/97	1625	112115	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		26.1	U F01,F07	2.22	11.2	mg/kg	1.0	JLP	12/02/97	1450	112263	2
TOTAL ORGANIC CARBON (TOC)		541	=	24.1	100	mg/kg	1.0	MWD	12/09/97	1621	112521	3

The following prep procedures were performed:

GC/MS Base/Neutral Compounds								GWL	11/28/97	2345	112074	1
TRACE								FGD	12/03/97	1230	111987	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
o-Terphenyl	TPH-DRO	77.5	(37.7 - 140.)
n-propylbenzene	BTEX-GC	128.	(51.9 - 133.)
n-propylbenzene	TPH-GRO	83.3	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified
M 3	SW846 9060 modified
M 4	EPA 3050

VOLATILE ORGANICS ANALYSIS DATA SHEET

141021DL1

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2K307

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: not dec. 13 Date Analyzed: 11/26/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 25.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	Benzene	57.5	U	UJ GD1,C08
108-88-3	Toluene	57.5	U	UJ
100-41-4	Ethylbenzene	463		J
1330-20-7	Xylenes (total)	1180		J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141021

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2012S

Matrix: (soil/water) SOIL Lab Sample ID: 9711552-05

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 8X407

Level: (low/med) LOW Date Received: 11/17/97

% Moisture: 13 decanted: (Y/N) N Date Extracted: 11/28/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/11/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	1460	
91-58-7	2-chloronaphthalene	381	U
208-96-8	acenaphthylene	381	U
83-32-9	acenaphthene	381	U
86-73-7	fluorene	381	U
85-01-8	phenanthrene	381	U
120-12-7	anthracene	381	U
206-44-0	fluoranthene	381	U
129-00-0	pyrene	381	U
56-55-3	benzo(a)anthracene	381	U
218-01-9	chrysene	381	U
205-99-2	benzo(b)fluoranthene	381	U
207-08-9	benzo(k)fluoranthene	381	U
50-32-8	benzo(a)pyrene	381	U
193-39-5	indeno(1,2,3-cd)pyrene	381	U
53-70-3	dibenz(a,h)anthracene	381	U
191-24-2	benzo(g,h,i)perylene	381	U

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FORM I SV-1

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

141021

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_ SDG No.: FS2012S
Lab Code: _____ Case No.: _____ SAS No.: _____
Matrix (soil/water): SOIL_ Lab Sample ID: 9711552-05
Level (low/med): LOW_ Date Received: 11/17/97
% Solids: _87.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7439-92-1	Lead	2.9			P	=

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

DATA VALIDATION COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 12, 1997

Sample ID : 141021
Lab ID : 9711552-05
Matrix : Soil
Date Collected : 11/14/97
Date Received : 11/17/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		13.0		1.00	1.00	wt%	1.0	ERH	11/28/97	1734	112112	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		220	=	4.55	23.0	mg/kg	2.0	JLP	12/01/97	1300	112201	2
TOTAL ORGANIC CARBON (TOC)		5820	=	24.1	100	mg/kg	1.0	MWD	12/06/97	1326	112521	3

The following prep procedures were performed:

GC/MS Base/Neutral Compounds	GWL	11/28/97	2345	112074 1
TRACE	FGD	12/03/97	1230	111987 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	120.	(51.9 - 133.)

M = Method	Method-Description
M 1	EPA 3550
M 2	EPA 418.1 Modified
M 3	SW846 9060 modified
M 4	EPA 3050

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VOLATILE ORGANICS ANALYSIS DATA SHEET

DATA VALIDATION COPY

1407W2

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2029W

Matrix: (soil/water) WATER Lab Sample ID: 9712414-17

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 2N5018

Level: (low/med) LOW Date Received: 12/15/97

% Moisture: not dec. _____ Date Analyzed: 12/19/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	2.0	U
108-88-3	Toluene	2.0	U
100-41-4	Ethylbenzene	2.0	U
1330-20-7	Xylenes (total)	4.0	U

DATA VALIDATION COPY

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

1407W2

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2028W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9712412-18

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2B105

Level: (low/med) LOW Date Received: 12/15/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/18/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/05/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1407W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2029W
Matrix (soil/water): WATER Lab Sample ID: 9712414-17
Level (low/med): LOW__ Date Received: 12/15/97
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	66800			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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FORM 1 VOLATILE ORGANICS ANALYSIS DATA SHEET

Science Applications 17-DEC 1997 SA

1408W2

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2032W

Matrix: (soil/water) WATER Lab Sample ID: 9712480-08

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 2P104

Level: (low/med) LOW Date Received: 12/17/97

% Moisture: not dec. _____ Date Analyzed: 12/29/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 10.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	238		
108-88-3	Toluene	20.0	U	
100-41-4	Ethylbenzene	179		
1330-20-7	Xylenes (total)	295		

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

1408W2

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2032W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9712480-13

Sample wt/vol: 1010 (g/mL) ML Lab File ID: 8C118

Level: (low/med) LOW Date Received: 12/17/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/22/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/12/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	67.1	
91-58-7	2-chloronaphthalene	9.9	U
208-96-8	acenaphthylene	9.9	U
83-32-9	acenaphthene	9.9	U
86-73-7	fluorene	9.9	U
85-01-8	phenanthrene	9.9	U
120-12-7	anthracene	9.9	U
206-44-0	fluoranthene	9.9	U
129-00-0	pyrene	9.9	U
56-55-3	benzo(a)anthracene	9.9	U
218-01-9	chrysene	9.9	U
205-99-2	benzo(b)fluoranthene	9.9	U
207-08-9	benzo(k)fluoranthene	9.9	U
50-32-8	benzo(a)pyrene	9.9	U
193-39-5	indeno(1,2,3-cd)pyrene	9.9	U
53-70-3	dibenz(a,h)anthracene	9.9	U
191-24-2	benzo(g,h,i)perylene	9.9	U

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1408W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2032

Matrix (soil/water): WATER Lab Sample ID: 9712480-13

Level (low/med): LOW__ Date Received: 12/17/97

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	17300			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN ILM02.1

DATA VALIDATION COPY

FORM 1 VOLATILE ORGANICS ANALYSIS DATA SHEET

Science Applications15-DEC-1997 SA

1409W2

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2029W

Matrix: (soil/water) WATER Lab Sample ID: 9712414-09

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 2N4019

Level: (low/med) LOW Date Received: 12/15/97

% Moisture: not dec. _____ Date Analyzed: 12/18/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	Benzene	12.8		=
108-88-3	Toluene	2.0	U	U5 CAP
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	7.1		=

FORM I VOA

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

1409W2

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2028W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9712412-17

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2B104

Level: (low/med) LOW Date Received: 12/15/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/18/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/05/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1409W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2029W
Matrix (soil/water): WATER Lab Sample ID: 9712414-09
Level (low/med): LOW__ Date Received: 12/15/97
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	36400			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN ILM02.1

1409W4

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2029W

Matrix: (soil/water) WATER Lab Sample ID: 9712414-08

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 2N4018

Level: (low/med) LOW Date Received: 12/15/97

% Moisture: not dec. _____ Date Analyzed: 12/18/97

GC Column: J&W DB-624(PID) ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		
71-43-2	Benzene	12.4		=
108-88-3	Toluene	2.0	U	U CB
100-41-4	Ethylbenzene	2.0	U	U
1330-20-7	Xylenes (total)	7.4		=

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

1409W4

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2028W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9712412-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2A616

Level: (low/med) LOW Date Received: 12/15/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/18/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/04/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	10.0	U
91-58-7	2-chloronaphthalene	10.0	U
209-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1409W4

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2029W
Matrix (soil/water): WATER Lab Sample ID: 9712414-08
Level (low/med): LOW__ Date Received: 12/15/97
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	37100			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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CHAIN OF CUSTODY RECORD

COC NO.: 511Ø28

ROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

ROJECT NUMBER: 01-0331-04-8358-300 .

ROJECT MANAGER: Patty Stoll

ampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH,DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
3208W2	12/13/97	1030	water			X						1	9712412-13
1515W4	12/14/97	1430				X						2	9712412-14
1515W2	12/14/97	1430				X						2	9712412-15
3009W2	12/13/97	1530				X						2	9712412-16
1409W2	12/14/97	1030				X						2	9712412-17
1407W2	12/14/97	1130	↓			X						2	9712412-18

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	
Laura Lumley; COMPANY NAME: SAIC	12/15/97 1308	[signature]; COMPANY NAME: GEL	12-15-97 1345	TOTAL NUMBER OF CONTAINERS: 11; Cooler ID: #311; Cooler Temperature: 4°C; FEDEX NUMBER:
RECEIVED BY: ; COMPANY NAME:	Date/Time	RELINQUISHED BY: ; COMPANY NAME:	Date/Time	Temp 6°c
RELINQUISHED BY: [signature]; COMPANY NAME: GEL	12-15-97 1615	RECEIVED BY: [signature]; COMPANY NAME: GEL	12-15-97 1615	

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CHAIN OF CUSTODY RECORD

COC NO.: 511 #29

PROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

PROJECT NUMBER: 01-0331-04-8358-300

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH, DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
307W2	12/13/97	1700	water			X						2	971241 2-07
0310W4	12/14/97	1745				X						2	971241 2-08
308W2	12/13/97	1550				X						2	971241 2-09
409W4	12/14/97	1030				X						2	971241 2-10
307W2	12/14/97	1235				X						2	971241 2-11
316W2	12/13/97	1110				X						2	971241 2-12

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	12/15/97		12-15-97
COMPANY NAME: SAIC	1300	COMPANY NAME: GEL	1315
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	12-15-97 1615	COMPANY NAME: GEL	12-15-97 1615

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: SAIC #3

Cooler Temperature: 4°C

FEDEX NUMBER:

Temp

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CHAIN OF CUSTODY RECORD

COC NO.: 5110-37

PROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

PROJECT NUMBER: 01-0331-04-8358-300

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	REQUESTED PARAMETERS: BTEX	BTEX, GRO	PAH	PAH,DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
3207W2	12/12/97	1235	water	X						X		3	9712414-01
3208W2	12/13/97	1030		X						X		3	02
3306W2	12/12/97	1630		X						X		3	03
3307W2	12/12/97	1535		X						X		3	04
3308W2	12/12/97	1750		X						X		3	05
3309W2	12/12/97	1630		X						X		3	06
0310W4	12/14/97	1745		X						X		3	07
1409W4	12/14/97	1030		X						X		3	08
1409W2	12/14/97	1030		X						X		3	09
1515W2	12/14/97	1430		X						X		3	10
1515W4	12/14/97	1430		X						X		3	11
3206W2	12/13/97	1110		X						X		3	12
3007W2	12/13/97	1700	V	X						X		3	13

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
Laura Lumley	12/15/97 1300		12.15.97 1300		4°C
COMPANY NAME: SAIC		COMPANY NAME: GEL		Cooler ID: #121	FEDEX NUMBER:
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 12.15.97 1615	RECEIVED BY:	Date/Time 12.15.97 1615		
COMPANY NAME: GEL		COMPANY NAME: GEL			

Temp 6°C

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CHAIN OF CUSTODY RECORD

COC NO.: S11030

PROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

PROJECT NUMBER: 01-0331-04-8368-300

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417

PHONE NO: (803) 556-8171

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH,DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
30046W2	12/13/97	1550	water	X						X		3	9712414-14
30049W2	12/13/97	1530		X						X		3	9712414-15
03105W2	12/14/97	1745		X						X		3	9712414-16
14075W2	12/14/97	1130		X						X		3	9712414-17
40945W4	12/												
520													
IBA025	12/12/97	745		X								2	9712414-18
IBA026	12/13/97	745		X								2	9712414-19
IBA030	12/14/97	745	↓	X								2	9712414-20

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS: 57	Cooler Temperature: 4°C
Laura Lumley	12/15/97 1300		12-15-97 1300	Cooler ID: #121	FEDEX NUMBER:
COMPANY NAME: SAIC		COMPANY NAME: GEL			
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME:		COMPANY NAME:			
RELINQUISHED BY:	Date/Time 12.15.97 1645	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			

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CHAIN OF CUSTODY RECORD

COC NO.: S1103

PROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

PROJECT NUMBER: 01-0331-04-8358-300

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH,DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
26Ø8W4	12/15/97	1645	water			X				X		3	9712480-10
3209W2	12/15/97	1615				X				X		3	9712480-11
26Ø9W2	12/15/97	1340				X				X		3	9712480-12
14Ø6W2	12/15/97	1500				X				X		3	9712480-13
1514W2	12/15/97	1720				X						2	9712480-14
2607W2	12/15/97	1645				X						2	9712480-15

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	12/17/97 1330		12.17.97 1330
COMPANY NAME: SAIC		COMPANY NAME: GEL	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY:	Date/Time 12/17/97 1610	RECEIVED BY:	Date/Time 12-17-97 1610
COMPANY NAME: SAIC		COMPANY NAME: GEL	

TOTAL NUMBER OF CONTAINERS: 16

Cooler ID: #131

Cooler Temperature: 4°C

FEDEX NUMBER:

Temp 6°C

A-52

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CHAIN OF CUSTODY RECORD

COC NO.: 511 036

PROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

PROJECT NUMBER: 01-0331-04-8358-300

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH, DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
26Ø6W2	12/15/97	1430	water	X		X				X		5	9712480-01
26Ø7W2	12/15/97	1625		X		X				X		3	9712480-02
26Ø8W2	12/15/97	1645		X						X		3	9712480-03
1514W2	12/15/97	1720		X						X		3	9712480-04
2609W2	12/15/97	1340		X								2	9712480-05
2606W4	12/15/97	1645		X								2	9712480-06
~~1007~~													
3209W2	12/15/97	1615		X								2	9712480-07
1406W2	12/15/97	1500		X								2	9712480-08
TBAØ32	12/15/97	745	↓	X								2	9712480-09

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY: Laura Lumley — Date/Time: 12/17/97 1330 — RECEIVED BY: [signature] — Date/Time: 12-17-97 1330

COMPANY NAME: SAIC — COMPANY NAME: GEL

TOTAL NUMBER OF CONTAINERS: 38 — 12/17/97

Cooler ID: #46 — 26

Cooler Temperature: 4°C

FEDEX NUMBER:

RELINQUISHED BY: — Date/Time — RELINQUISHED BY: — Date/Time

COMPANY NAME: — COMPANY NAME:

Temp 5°C

RELINQUISHED BY: [signature] — Date/Time: 12/17/97 1610 — RECEIVED BY: [signature] — Date/Time: 12-17-97 1610

COMPANY NAME: GEL — COMPANY NAME: GEL

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CHAIN OF CUSTODY RECORD

COC NO.: PB11005

PROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

PROJECT NUMBER: 01-0331-04-8358-300

PROJECT MANAGER: Patty Stoll

Sampler (Signature): (Printed Name): JULIA GARTSEFF

REQUESTED PARAMETERS

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH, DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	TPH	TOC	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
480721	11-14-97	1035	Soil		X			X						2	9711552-01
320811	11-14-97	1850	Soil	X		X					X	X	X	2	-02
320721	11-14-97	1715	Soil	X		X					X	X	X	2	-03
320711	11-14-97	1710	Soil	X		X						X		2	-04
141021	11-14-97	1550	Soil	X		X					X	X	X	2	-05
530511	11-14-97	0915	Soil	X		X					X	X	X	2	-06
140911	11-14-97	1520	Soil	X		X						X		2	-07
5305W2	11-14-97	0930	Water	X		X								4	9711546-01 30138.1
TBA011	11-14-97	0745	Water	X										2	546-02 .2
140711	11-14-97	1230	Soil	X		X						X		2	-08 19
141011	11-14-97	1550	Soil	X		X						X		2	-20
3008R5	11-15-97	1400	Water		X		X							5	546-03 .3

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: SAIC	11/17/97 1430	COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	11/17/97 1430	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	11/17/97 1645	COMPANY NAME: GEL	11/17/97 1645

TOTAL NUMBER OF CONTAINERS:

Cooler ID:

Cooler Temperature: Temp 5°C

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: PB 11006

OJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

OJECT NUMBER: 01-0331-04-8358-300

OJECT MANAGER: Patty Stoll

Sampler (Signature): [signature] (Printed Name): JULIA GARTSEFF

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, GRO	PAH	PAH,DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	TPH	TOC	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
320925	11-14-97	1400	water	X		X						X		5	9711456-04 VO 11/20/97
320911	11-14-97	1350	soil	X		X						X		2	9711552-08
320921	11-14-97	1355	soil	X		X					X	X	X	2	-09
320611	11-14-97	1535	soil	X		X						X		2	-10
140713	11-14-97	1230	soil	X		X						X		2	-11
301021	11-15-97	1715	soil		X			X						2	-12
361011	11-15-97	1710	soil		X		X							2	-13
140721	11-14-97	1225	soil	X		X					X	X	X	2	-14
300811	11-15-97	1355	soil		X		X							2	-15
1408 11	11-14-97	1830	soil	X		X						X		2	-16
300911	11-15-97	1530	soil		X		X							2	-17
320613	11-14-97	1535	soil	X		X					X	X	X	2	320613 547-18
301013	11-15-97	1710	soil		X		X							2	9711547-01

REQUESTED PARAMETERS

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
COMPANY NAME: SAIC	11/17/97 1430	COMPANY NAME:		Cooler ID:	FEDEX NUMBER:
RECEIVED BY: [signature]	Date/Time 11/17/97 1430	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEC		COMPANY NAME:			
RELINQUISHED BY: [signature]	Date/Time 11/17/97 1645	RECEIVED BY: [signature]	Date/Time 11/17/97 1645		
COMPANY NAME: GEC		COMPANY NAME: GEC			

Temp 5°C

A-55

5

SAIC An Employee-Owned Company
Science Applications International Corporation
00 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.: PB11007

ROJECT NAME: Fort Stewart CAP Part B-Option 1-UST Investigation

ROJECT NUMBER: 01-0331-04-8358-300 .

ROJECT MANAGER: Patty Stoll

ampler (Signature) [signature] (Printed Name) JULIA GARTSEFF

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	BTEX, DRO	PAH	PAH,DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON --	LEAD	TPH	TOC	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
486811	11-14-97	0845	soil		X			X						2	9711547-02
140821	11-14-97	1815	soil	X		X								2	-03
480813	11-14-97	0845	soil		X		X							2	-04
~~480711~~	~~11-14-97~~	~~1025~~	~~soil~~	~~X~~		~~X~~					~~X~~	~~X~~	~~X~~		
480711	11-14-97	1025	soil		X		X							2	-05
300921	11-15-97	1540	soil		X			X						2	-06
300821	11-15-97	1345	soil		X			X						2	-07
300711	11-15-97	1000	soil		X		X							2	-08
300721	11-15-97	0825	soil		X			X						2	-09
480821	11-14-97	0850	soil		X			X						2	-10
320621	11-14-97	1530	soil	X		X					X	X	X	2	-11
140921	11-14-97	1530	soil	X		X					X	X	X	2	-12
320821	11-14-97	1920	soil	X		X						X		2	-13

RELINQUISHED BY: [signature]	Date/Time 11/17/97 1430	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
COMPANY NAME: SAIC		COMPANY NAME:		Cooler ID:	FEDEX NUMBER:
RECEIVED BY: [signature]	Date/Time 11/17/97 1430	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL		COMPANY NAME:			
RELINQUISHED BY: [signature]	Date/Time 11/17/97 1645	RECEIVED BY: [signature]	Date/Time 1645 11/17/97		
COMPANY NAME: GEL		COMPANY NAME: GEL			

Temp 4°C

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-08

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 8K217

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: not dec. 32 Date Analyzed: 11/24/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.9	U	U
108-88-3	toluene	1.0	J	J
100-41-4	ethylbenzene	2.9	U	U
1330-20-7	xylenes (total)	4.4	U	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141111

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-08

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V319

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: 32 decanted: (Y/N) N Date Extracted:11/19/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	490	U
91-58-7	2-chloronaphthalene	490	U
208-96-8	acenaphthylene	490	U
83-32-9	acenaphthene	490	U
86-73-7	fluorene	490	U
85-01-8	phenanthrene	490	U
120-12-7	anthracene	490	U
206-44-0	fluoranthene	490	U
129-00-0	pyrene	490	U
56-55-3	benzo(a)anthracene	490	U
218-01-9	chrysene	490	U
205-99-2	benzo(b)fluoranthene	490	U
207-08-9	benzo(k)fluoranthene	490	U
50-32-8	benzo(a)pyrene	490	U
193-39-5	indeno(1,2,3-cd)pyrene	490	U
53-70-3	dibenz(a,h)anthracene	490	U
191-24-2	benzo(g,h,i)perylene	490	U

DATA VALIDATION
COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part B UST Investigations

cc: SAIC01798 Report Date: December 04, 1998

Sample ID : 141111
Lab ID : 9811606-08
Matrix : Soil
Date Collected : 11/14/98
Date Received : 11/16/98
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M	
General Chemistry												
Total Rec. Petro. Hydrocarbons	U	6.81	7.29	14.7	mg/kg	1.0	AAT	11/30/98	1000	136808	1	U

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

301

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141121

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-15

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 8K231

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: not dec. 28 Date Analyzed: 11/24/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.8	U	U
108-88-3	toluene	1.3	J	J
100-41-4	ethylbenzene	2.8	U	U
1330-20-7	xylenes (total)	4.2	U	U

FORM I VOA OLM03.0

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: 141121

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V326

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: 28 decanted: (Y/N) N Date Extracted: 11/19/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	463	U
91-58-7	2-chloronaphthalene	463	U
208-96-8	acenaphthylene	463	U
83-32-9	acenaphthene	463	U
86-73-7	fluorene	463	U
85-01-8	phenanthrene	463	U
120-12-7	anthracene	463	U
206-44-0	fluoranthene	463	U
129-00-0	pyrene	463	U
56-55-3	benzo(a)anthracene	463	U
218-01-9	chrysene	463	U
205-99-2	benzo(b)fluoranthene	463	U
207-08-9	benzo(k)fluoranthene	463	U
50-32-8	benzo(a)pyrene	463	U
193-39-5	indeno(1,2,3-cd)pyrene	463	U
53-70-3	dibenz(a,h)anthracene	463	U
191-24-2	benzo(g,h,i)perylene	463	U

U

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS8001S

Method Type: Total Metals

Sample ID: 9811606-15		Client ID: 141121	
Contract: SAIC01798	Lab Code: GEL	Case No.:	SAS No.:
Matrix: SOIL	Date Received: 11/16/98	Level: LOW	
% Solids: 72.00			

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run	
7439-92-1	Lead	14.7	mg/kg	B		P	0.19	TJA61 Trace2 ICPAES	981202-1	J

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments: _____

DATA VALIDATION
COPY

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part B UST Investigations

cc: SAIC01798 Report Date: December 04, 1998

Sample ID	: 141121
Lab ID	: 9811606-15
Matrix	: Soil
Date Collected	: 11/14/98
Date Received	: 11/16/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons	J	8.31	6.87	13.9	mg/kg	1.0	AAT	12/02/98	1600	136982	1
TOTAL ORGANIC CARBON (TOC)		13000	24.1	100	mg/kg	1.0	LS	11/30/98	1929	136819	2

M = Method	Method-Description
M 1	EPA 418.1 Modified
M 2	SW846 9060 Modified

Notes:
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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

308

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141211

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-07

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 8K216

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: not dec. 20 Date Analyzed: 11/24/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.5	U	UJ
108-88-3	toluene	1.7	J	
100-41-4	ethylbenzene	2.5	U	
1330-20-7	xylenes (total)	1.0	J	

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141211

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-07

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V318

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: 20 decanted: (Y/N) N Date Extracted: 11/19/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	417	U
91-58-7	2-chloronaphthalene	417	U
208-96-8	acenaphthylene	417	U
83-32-9	acenaphthene	417	U
86-73-7	fluorene	417	U
85-01-8	phenanthrene	417	U
120-12-7	anthracene	417	U
206-44-0	fluoranthene	417	U
129-00-0	pyrene	417	U
56-55-3	benzo(a)anthracene	417	U
218-01-9	chrysene	417	U
205-99-2	benzo(b)fluoranthene	417	U
207-08-9	benzo(k)fluoranthene	417	U
50-32-8	benzo(a)pyrene	417	U
193-39-5	indeno(1,2,3-cd)pyrene	417	U
53-70-3	dibenz(a,h)anthracene	417	U
191-24-2	benzo(g,h,i)perylene	417	U

U

DATA VALIDATION
COPY

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part B UST Investigations

cc: SAIC01798 Report Date: December 04, 1998 Page 1 of 1

Sample ID	: 141211
Lab ID	: 9811606-07
Matrix	: Soil
Date Collected	: 11/14/98
Date Received	: 11/16/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M	
General Chemistry												
Total Rec. Petro. Hydrocarbons	J	7.44	6.20	12.5	mg/kg	1.0	AAT	11/30/98	1000	136808	1	J

M = Method	Method-Description
M 1	EPA 418.1 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
standard operating procedures. Please direct
any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

300

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141221

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-16

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 8K311

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: not dec. 5 Date Analyzed: 11/25/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
71-43-2	benzene	2.1	U	UJ
108-88-3	toluene	1.1	J	
100-41-4	ethylbenzene	0.55	J	
1330-20-7	xylenes (total)	0.61	J	

DATA VALIDATED

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141221

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7W203

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: 5 decanted: (Y/N) N Date Extracted: 11/19/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	51.2	J
91-58-7	2-chloronaphthalene	351	U
208-96-8	acenaphthylene	351	U
83-32-9	acenaphthene	351	U
86-73-7	fluorene	351	U
85-01-8	phenanthrene	351	U
120-12-7	anthracene	351	U
206-44-0	fluoranthene	351	U
129-00-0	pyrene	351	U
56-55-3	benzo(a)anthracene	351	U
218-01-9	chrysene	351	U
205-99-2	benzo(b)fluoranthene	351	U
207-08-9	benzo(k)fluoranthene	351	U
50-32-8	benzo(a)pyrene	351	U
193-39-5	indeno(1,2,3-cd)pyrene	351	U
53-70-3	dibenz(a,h)anthracene	351	U
191-24-2	benzo(g,h,i)perylene	351	U

CA

DATA VALIDATION COPY

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS8001S

Method Type: Total Metals

Sample ID: 9811606-16

Client ID: 141221

Contract: SAIC01798 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 11/16/98 Level: LOW

% Solids: 95.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run	
7439-92-1	Lead	1.3	mg/kg	B		P	0.15	TJA61 Trace2 ICPAES	981202-1	J

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

Client:	Science Applications International Corp. P.O. Box 2502 800 Oak Ridge Turnpike Oak Ridge, Tennessee 37831
Contact:	Ms. Lorene Rollins
Project Description:	CAP-Part B UST Investigations

cc: SAIC01798 Report Date: December 04, 1998

Sample ID	: 141221
Lab ID	: 9811606-16
Matrix	: Soil
Date Collected	: 11/14/98
Date Received	: 11/16/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		21.9	5.21	10.5	mg/kg	1.0	AAT	12/02/98	1600	136982	1
TOTAL ORGANIC CARBON (TOC)		3010	24.1	100	mg/kg	1.0	LS	12/01/98	1621	136965	2

M = Method	Method-Description
M 1	EPA 418.1 Modified
M 2	SW846 9060 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

9811606-16

DUPLICATE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141223

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-11

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 8K220

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: not dec. 7 Date Analyzed: 11/24/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	benzene	2.2	U
108-88-3	toluene	5.4	
100-41-4	ethylbenzene	1.4	J
1330-20-7	xylenes (total)	4.0	

U = J =

DUPLICATE

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141223

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8001S

Matrix: (soil/water) SOIL Lab Sample ID: 9811606-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 7V322

Level: (low/med) LOW Date Received: 11/16/98

% Moisture: 7 decanted: (Y/N) N Date Extracted: 11/19/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/25/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	81.9	J
91-58-7	2-chloronaphthalene	358	U
208-96-8	acenaphthylene	358	U
83-32-9	acenaphthene	358	U
86-73-7	fluorene	358	U
85-01-8	phenanthrene	358	U
120-12-7	anthracene	358	U
206-44-0	fluoranthene	358	U
129-00-0	pyrene	358	U
56-55-3	benzo(a)anthracene	358	U
218-01-9	chrysene	358	U
205-99-2	benzo(b)fluoranthene	358	U
207-08-9	benzo(k)fluoranthene	358	U
50-32-8	benzo(a)pyrene	358	U
193-39-5	indeno(1,2,3-cd)pyrene	358	U
53-70-3	dibenz(a,h)anthracene	358	U
191-24-2	benzo(g,h,i)perylene	358	U

J
U

DATA VALIDATION COPY

DUPLICATE

Form 1: Inorganic Analyses Data Sheet

SDG No.: FS8001S

Method Type: Total Metals

Sample ID: 9811606-11

Client ID: 141223

Contract: SAIC01798 Lab Code: GEL Case No.: SAS No.:

Matrix: SOIL Date Received: 11/16/98 Level: LOW

% Solids: 93.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run	
7439-92-1	Lead	1.5	mg/kg	B		P	0.16	TJA61 Trace2 ICPAES	981202-1	J

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

DATA VALIDATION COPY

DUPLICATE

Client: Science Applications International Corp.
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part B UST Investigations

cc: SAIC01798 Report Date: December 04, 1998

Sample ID	: 141223
Lab ID	: 9811606-11
Matrix	: Soil
Date Collected	: 11/14/98
Date Received	: 11/16/98
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry											
Total Rec. Petro. Hydrocarbons		63.3	5.33	10.8	mg/kg	1.0	AAT	12/02/98	1600	136982	1
TOTAL ORGANIC CARBON (TOC)		7530	24.1	100	mg/kg	1.0	LS	11/30/98	1806	136819	2

M = Method	Method-Description
M 1	EPA 418.1 Modified
M 2	SW846 9060 Modified

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

304

DATA VALIDATION COPY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8002W

Matrix: (soil/water) WATER Lab Sample ID: 9812227-03

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2M111

Level: (low/med) LOW Date Received: 12/04/98

% Moisture: not dec. _____ Date Analyzed: 12/07/98

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
71-43-2	benzene	2.0	U	U
108-88-3	toluene	2.0	U	
100-41-4	ethylbenzene	2.0	U	
1330-20-7	xylenes (total)	3.0	U	

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

141212

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS8002W

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9812227-03

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 7X516

Level: (low/med) LOW Date Received: 12/04/98

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/08/98

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/11/98

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	naphthalene	13.0	
91-58-7	2-chloronaphthalene	10.0	U
208-96-8	acenaphthylene	10.0	U
83-32-9	acenaphthene	10.0	U
86-73-7	fluorene	10.0	U
85-01-8	phenanthrene	10.0	U
120-12-7	anthracene	10.0	U
206-44-0	fluoranthene	10.0	U
129-00-0	pyrene	10.0	U
56-55-3	benzo(a)anthracene	10.0	U
218-01-9	chrysene	10.0	U
205-99-2	benzo(b)fluoranthene	10.0	U
207-08-9	benzo(k)fluoranthene	10.0	U
50-32-8	benzo(a)pyrene	10.0	U
193-39-5	indeno(1,2,3-cd)pyrene	10.0	U
53-70-3	dibenz(a,h)anthracene	10.0	U
191-24-2	benzo(g,h,i)perylene	10.0	U

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1 of 2

CHAIN OF CUSTODY RECORD 981160C

COC NO.: GB001

PROJECT NAME: CAP-Part B UST Investigations

PROJECT NUMBER: 01-0331-04-8358-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

	Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, TPH, Lead, TOC	PAH, DRO, Lead, TOC	Dissolved Iron	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
01	031113	11/14/98	1116	Soil			1	1					2		
02	031111	11/14/98	1116				1	1					2		
03	031121	11/14/98	1102				1				1		2		
04	421021	11/15/98	912				1				1		2		
05	331011	11/15/98	1040		1				1				2		
06	321011	11/14/98	1544		1				1				2		
07	141211	11/14/98	1750		1				1				2		
08	141111	11/14/98	1515		1				1				2		
09	321111	11/14/98	1423		1				1				2		
10	321211	11/14/98	1726		1				1				2		
11	141223	11/14/98	1725		1					1			2		
12	321221	11/14/98	1709		1					1			2		
13	321121	11/14/98	1420		1					1			2		

REQUESTED PARAMETERS

.67 .2 .3 .4

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
Laura Lumley	11/16/98 1230		11-16-98 1600	Cooler ID: #675	FEDEX NUMBER:
COMPANY NAME: SAIC		COMPANY NAME: G.E.L			
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GEL	11/16/98 1230	COMPANY NAME:			
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time		
COMPANY NAME: GEL	11-16-98 1600	COMPANY NAME:			

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2 of 2

CHAIN OF CUSTODY RECORD

COC NO.: GB00Z

PROJECT NAME: CAP-Part B UST Investigations

PROJECT NUMBER: 01-0331-04-8358-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature): Laura Lumley (Printed Name): Laura Lumley

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, TPH, Lead, TOC	PAH, DRO, Lead, TOC	Dissolved Iron	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
TH 33102|	11/15/98	1055	Soil	1					1			2		
45 14112|	11/14/98	1520		1					1			2		
46 14122|	11/14/98	1725		1					1			2		
47 32102|	11/14/98	1543	↓	1					1			2		

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	11/16/98		
COMPANY NAME: SAIC	1230	COMPANY NAME:	
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME: GEL	11-16-98 1230	COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: GEL	11-16-98 1600	COMPANY NAME:	

TOTAL NUMBER OF CONTAINERS: 34

Cooler ID: # 675

Cooler Temperature:

FEDEX NUMBER:

11/16/98

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Science Applications International Corporation
800 Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4600

CHAIN OF CUSTODY RECORD

COC NO.: GB00Z

PROJECT NAME: CAP-Part B UST Investigations

PROJECT NUMBER: 01-0331-04-8358-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature) (Printed Name)
Laura Lumley Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, TPH, Lead, TOC	PAH, DRO, Lead, TOC	Dissolved Iron	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
✓ 321212	12/2/98	1755	water		Z							Z		9812227-12
✓ 321112	12/3/98	1130			Z							Z		-13
✓ 031212	12/3/98	1325			Z							Z		-14
✓ 031112	12/3/98	1440			Z							Z		-15
✓ 321014	12/3/98	1025			Z							Z		-16
✓ 421012	12/3/98	1040	↓		Z							Z		-17

12/4/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	12/4/98	Raymond Reed	12/4/98
COMPANY NAME: SAIC	1305	COMPANY NAME:	13:05
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY: Raymond Reed	Date/Time 12/4/98	RECEIVED BY: Francis	Date/Time 12/4/98
COMPANY NAME: GEL	16:15	COMPANY NAME: GEL	1615

TOTAL NUMBER OF CONTAINERS: 12

Cooler ID: # 717

Cooler Temperature:

FEDEX NUMBER:

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CHAIN OF CUSTODY RECORD

COC NO.: GB003

PROJECT NAME: CAP-Part B UST Investigations

PROJECT NUMBER: 01-0331-04-8358-220

PROJECT MANAGER: Patty Stoll

Sampler (Signature) Laura Lumley (Printed Name) Laura Lumley

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Raod, Charleston, SC 29417

PHONE NO: (803) 556-8171

Sample ID	Date Collected	Time Collected	Matrix	BTEX	PAH	BTEX, GRO	PAH, DRO	PAH, TPH	PAH, TPH, Lead, TOC	PAH, DRO, Lead, TOC	Dissolved Iron	No. of Bottles/ Vials:	OVA SCREENING	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
331012	12/3/98	1345	water	2	2							4		9812227-01
321012	12/3/98	1025		2	2							4		-02
141212	12/3/98	1518		2	2							4		03
421012	12/3/98	1040		2								2		04
321112	12/3/98	1130		2								2		05
321212	12/2/98	1755		2								2		06
031212	12/3/98	1325		2								2		07
321014	12/3/98	1025		2								2		08
031112	12/3/98	1440		2								2		09
TBB010	12/2/98	645		2								2		10
TBB011	12/3/98	800	↓	2								2		-11

12/4/98

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	12/4/98	Raymond Reed	12/4/98
COMPANY NAME: SAIC	1305	COMPANY NAME: GE. Lab	1305
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY: Raymond Reed	Date/Time 12/4/98	RECEIVED BY:	Date/Time 12/4/98
COMPANY NAME: GEL	1615	COMPANY NAME: GEL	1615

TOTAL NUMBER OF CONTAINERS: 24

Cooler ID: # 718

Cooler Temperature:

FEDEX NUMBER:

General Engineering Laboratories, Inc.

TARGET COMPOUNDS

Client Name: Science Applications08-JAN-1999 Client SDG: FS5A001W
Lab Smp Id: 9901216-01 Client Smp ID: 141122
Sample Location: FT. STEWART Sample Point:
Sample Date: JAN/07/99 Date Received: JAN/08/99
Sample Matrix: GroundH2O Quant Type: ISTD
Analysis Type: VOA Level: LOW
Data Type: MS DATA Operator: MAP
Misc Info: |9901216-01|139420|1|VOA/MS/W|||

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/KG) ug/l	Q
75-71-8	xylenes (total)	0.52	J
71-43-2	benzene	4.5	J
108-88-3	toluene	0.52	J
100-41-4	ethylbenzene	5.0	U
1868-53-7	Dibromofluoromethane	49.3	
2037-26-5	toluene-d8	49.3	
460-00-4	bromofluorobenzene	52.6	

HHH

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Science Applications International Corp.
800 Oak Ridge Turnpike
P.O. Box 2502
Oak Ridge, Tennessee 37831
Contact: Ms. Lorene Rollins
Project Description: CAP-Part B UST Long Term Monitoring

cc: SAIC01298

Report Date: January 11, 1999

Sample ID : 141122
Lab ID : 9901216-01
Matrix : Water
Date Collected : 01/07/99
Date Received : 01/08/99
Priority : Urgent
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Extractable Organics											
GCMS Library Search-B/N							MKP	01/09/99	1919	139409	1
Polyaromatic Hydrocarbon Compounds - 17 items											
2-CHLORONAPHTHALENE	U	ND	2.54	10.6	ug/l	1.0					
ACENAPHTHENE	U	ND	2.33	10.6	ug/l	1.0					
ACENAPHTHYLENE	U	ND	1.38	10.6	ug/l	1.0					
ANTHRACENE	U	ND	2.44	10.6	ug/l	1.0					
BENZO(A)ANTHRACENE	U	ND	2.97	10.6	ug/l	1.0					
BENZO(A)PYRENE	U	ND	2.12	10.6	ug/l	1.0					
BENZO(B)FLUORANTHENE	U	ND	4.98	10.6	ug/l	1.0					
BENZO(G,H,I)PERYLENE	U	ND	2.65	10.6	ug/l	1.0					
BENZO(K)FLUORANTHENE	U	ND	2.76	10.6	ug/l	1.0					
CHRYSENE	U	ND	2.33	10.6	ug/l	1.0					
DIBENZO(A,H)ANTHRACENE	U	ND	2.86	10.6	ug/l	1.0					
FLUORANTHENE	U	ND	3.29	10.6	ug/l	1.0					
FLUORENE	U	ND	2.23	10.6	ug/l	1.0					
INDENO(1,2,3-CD) PYRENE	U	ND	3.60	10.6	ug/l	1.0					
NAPHTHALENE	U	ND	2.12	10.6	ug/l	1.0					
PHENANTHRENE	U	ND	1.91	10.6	ug/l	1.0					
PYRENE	U	ND	2.65	10.6	ug/l	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-SAIC	73.4	(43.0 - 108.)
Nitrobenzene-d5	M610-SAIC	68.6	(35.0 - 111.)
p-Terphenyl-d14	M610-SAIC	44.0	(33.0 - 125.)

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9901216-01

APPENDIX B

FIELD BORING LOGS

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14-01

PROJECT: Ft. Stewart UST | INSPECTOR: M. Watt | SHEET: 1 of 2

RUN (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	SPLIT SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.0	Concrete Pad				
	1.0	Sandy clay, reddish brown, fine	0.0 ppm		Soil Sample 140181	
	2.0	Sand, dark gray, fine				
	3.0	Sandy clay, gray, fine	16.2 ppm			
	4.0					
	5.0	Sand, gray, fine				Perched
	6.0	Sandy clay, gray, fine to medium	0.0 ppm			
	7.0					
	8.0	Sand, brown, fine to medium	0.0 ppm			Piezometer Casing
	9.0	Sand, black, fine to medium				
	10.0					

14-01

PROJECT: F. Stewart UST | INSPECTOR: M. Vant | SHEET: 2 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUNDWATER SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0					
	11.0	Clay, greenish gray	0.0 ppm			
	12.0					
	13.0					
	14.0		0.0 ppm			
	15.0					
	16.0		0.0 ppm			
	17.0					
	18.0		0.0 ppm			
	19.0					
	20.0	Clayey sand, greenish gray, fine				

Soil Sample 1401H1

Approx. Groundwater Sample 1401W2 collected from Piezometer Screen

14-02

PROJECT	Ft. Stewart UST	INSPECTOR	M. Vest	SHEET	1 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUNDWATER SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.0	Concrete Pad				
	1.0	Sand, brown, fine	0.0 ppm			
	2.0					
	3.0					
	4.0	Clay, greenish gray	0.0 ppm			
		Sand, gray, fine to medium				
	5.0					
	6.0		0.0 ppm		Soil Sample 14021	
	7.0					
	8.0		0.0 ppm		Soil Sample 14022	
	9.0					
	10.0					

Piezometer Casing

14-02

PROJECT	Ft. Stewart UST	INSPECTOR	M. Vest	SHEET	2 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUNDWATER SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0					▼ Approx.
	11.0		0.0 ppm			
	12.0					
	13.0					Piezometer Screen
	14.0	Clay, greenish gray	0.0 ppm			
	15.0					Groundwater Sample 1402W2 Collected From Piezometer

14-03

PROJECT Ft. Stewart UST | INSPECTOR M. Pauli | SHEET 1 of 1

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	CENTER OF SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.0	Concrete Pad				
	1.0	Sandy Silt, gray	21.6 ppm		Soil Sample 1403A1	Piezometer Casing
	3.0		0.0 ppm		Soil Sample 1403B1	
	4.0					
	5.0	No Material Collected (Power Punch)				Approx. Piezometer Screen
	6.0					
	7.0					
	8.0					
	9.0					Groundwater Sample 1403W2 Collected From Piezometer

14-04

PROJECT	Ft. Stewart UST	INSPECTOR	M. Pace	SHEET	1 of 1

BLOW (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GRAB SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.0	Concrete Pad				
	1.0	Sandy Silt, olive	0.0 ppm		Soil Sample 1404A1	Piezometer Casing
	2.0	Sand, reddish brown, fine				
	3.0		0.0 ppm		Soil Sample 1404B1	
	4.0					
	5.0	No Material Collected (Power Punch)				▼ Approx. Piezometer Screen
	6.0					
	7.0					
	8.0					Groundwater Sample 1404W2 Collected From Piezometer

14-05

PROJECT Ft. Stewart UST | INSPECTOR J. Kilg | SHEET 1 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.0	Concrete Pad				
	1.0	Silty Sand, dark gray, fine to medium	14.5 ppm		Soil Sample 140SA1	
	2.0					
	3.0					
	4.0		2.1 ppm			
	5.0	Clayey Sand, bluish gray, fine to coarse				
	6.0		0.0 ppm			
	7.0					
	8.0	Clay, brackish gray				
	9.0		0.0 ppm			
	10.0					

Piezometer casing

PROJECT: Ft. Stewart UST | INSPECTOR: J. Kings | SHEET: 2 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0					
	11.0		0.0 ppm		Soil Sample 1405F1	
	12.0					
	13.0					
	14.0	Clayey Sand, greenish gray, fine to medium	0.0 ppm			Approx.
	15.0	No Material Collected (Power Punch)			Groundwater Sample 1405W2	Piezometer Screen
	16.0					
	17.0					

14-06a

PROJECT: Ft. Stewart UST | INSPECTOR: J. King | SHEET: 1 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUTED SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0.0	Concrete Pad				
	1.0					
	2.0	Clayey, silty sand, dark gray, fine to medium	133.3 ppm		Soil Sample 140641	
	3.0					
	4.0		5.8 ppm		Soil Sample 140681	
	5.0					
	6.0		109.4 ppm			Piezometer Casing
	7.0					
	8.0	No Sample due To Poor Recovery				
	9.0					
	10.0					

14-06

PROJECT: Ft. Stewart UST | INSPECTOR: J. King | SHEET: 2 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUTED SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0	Wood Fragments				
	11.0	Sand, greenish gray, fine to medium	14.2 ppm			▼ Approx.
	12.0	Sandy clay, greenish gray, fine				
	13.0	No Sample Due To Poor Recovery				
	14.0					
	15.0					Groundwater Sample 1406W2 Collected From Piezometer

Piezometer Screen

HTRW DRILLING LOG

HOLE NUMBER 14-07

PROJECT Fort Stewart USTs | INSPECTOR C. Grubbs | SHEET 1 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Concrete				
	1	SAND, medium to coarse grained, dry, light brownish gray (2.5Y, 6/2)	0.0ppm			
	2					
	3					
	4		0.0ppm		Soil Sample 140711	
	5	SAND, medium to coarse grained, moist, light brownish gray (2.5Y, 6/2)				▼ Wet Below 5.5 FT BGS
	6	Clayey SAND, firm, wet, gray (10YR 6/1)	0.0ppm			
	7	sandy CLAY, fine to medium grained, wet, dark gray (10YR 4/1)				
	8					
	9		0.0ppm		Soil Sample 140721	
	10					

HTRW DRILLING LOG

PROJECT	INSPECTOR	HOLE NUMBER	SHEET
Fort Stewart USTs	C. Grubbs	14-07	2 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	11	CLAY, firm, moist, gley (5/5GY)	0.0ppm	Soil Sample 140731		
	12					
	13					End of Drilling at 13.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 14-08

PROJECT Fort Stewart USTs | INSPECTOR C. Grubbs | SHEET 1 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	1	Concrete				
	2	SAND, medium to coarse grained, dry, gray (2.5 Y 6/2)	25.2 ppm		Soil Sample 140821	
	3					
	4		7.0 ppm			
	5					
	6	Sandy CLAY, fine to medium grained, moist to wet, dark gray (10YR 4/1)				▼ Wet Below 6.0FT BGS
	7		1.5 ppm			
	8					
	9		0.5 ppm			
	10					

HTRW DRILLING LOG

HOLE NUMBER 14-08

PROJECT Fort Stewart USTs | INSPECTOR C. Grubbs | SHEET 2 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11	Sandy CLAY, fine to medium grained, wet, dark gray (10YR 4/1)	0.0 ppm		Soil Sample 140811	
	12					
	13		0.0 ppm	Soil Sample 140831		
	14	SAND, clean, fine to coarse grained, wet, dark greenish gray (gley(1) 4/5GY)				
	15					End of Drilling at 15.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 14-09

PROJECT Fort Stewart USTs

INSPECTOR C. Grubbs

SHEET 1 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0–1	Concrete			Soil Sample 140921	
	1–2	SAND, medium to coarse grained, dry, light brownish gray (2.5Y 6/2)	66ppm			
	2–3					
	3–4		60ppm			
	4–5					
	5–6	SAND, medium to very coarse grained, light brownish gray (2.5Y 6/2)				
	6–7	Sandy CLAY, hard, fine to medium grained, wet, dark gray (10YR 4/1)	47ppm			▼ Wet Below 6.0FT BGS
	7–8					
	8–9		47ppm			
	9–10					

HTRW DRILLING LOG

PROJECT	Fort Stewart USTs	INSPECTOR	C. Grubbs	HOLE NUMBER	14-09
				SHEET	2 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11	CLAY, firm, wet, greenish gray (gley 5/5GY)	43ppm		Soil Sample 141011	
	12	SAND, clean, fine to coarse grained, some organics. dark greenish gray (gley 1) 4/5GY)	46ppm			
	13					End of Drilling 13.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 14-10

PROJECT Fort Stewart USTs | INSPECTOR C. Grubbs | SHEET 1 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Concrete	196ppm		Soil Sample 14101	
	1	SAND, medium grained, organics, light brownish gray (2.5Y 6/2)				
	2	Insufficient Soil Recovery	N/A			
	3					
	4					
	5	Sandy CLAY, fine to medium grained, hard, wet, dark gray (10YR 4/1)	48ppm		Soil Sample 14011	▼ Wet Below 5.0FT BGS
	6					
	7	Insufficent Soil Recovery (Wood and Roots)				
	8					
	9					
	10					

HTRW DRILLING LOG

PROJECT	INSPECTOR	HOLE NUMBER	SHEET
Fort Stewart USTs	C. Grubbs	14-10	2 of 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11	Shelby Tube		Soil Sample 14031		
	12					End of Drilling at 12.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 14-11

PROJECT: Fort Stewart USTs | INSPECTOR L. Mercado | SHEET 1 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	CONCRETE				
	1	silty SAND (SM), 20-30% silt, fine grained, well rounded, dry, black (2.5Y 2.5/1)	8.5ppm			
	2	silty SAND (SM), 15-20% silt, fine to medium grained, well rounded, loose, moist, gray (2.5Y 6/1)				
	3		N/A			
	4					
	5					
	6	CLAY (CL), firm, medium plasticity, medium toughness, moist, dark greenish gray (2GLEY 4/1)	7.9ppm		Soil Sample 141111	
	7					
	8		9.7ppm		Soil Sample 141121	
	9					
	10	silty SAND (SW-SM), 10-15% silt, fine to medium sand, loose, well rounded, wet, light greenish gray (1GLEY 7/1)				▽ wet below 10.0 ft BGS

HTRW DRILLING LOG

HOLE NUMBER 14-11

PROJECT: Fort Stewart USTs | INSPECTOR L. Mercado | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11	Silty SAND (AS ABOVE)		Soil Sample 14 11 31		
	12					
	13					
	14					
	15					END OF DRILLING AT 15.0 FT BGS
	16					
	17					
	18					
	19					
	20					

HTRW DRILLING LOG

HOLE NUMBER 14-12

PROJECT: Fort Stewart USTs | INSPECTOR L. Mercado | SHEET 1 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	CONCRETE				
	1	silty SAND (SM), 20-30% silt, fine to medium grained, well rounded, loose, dry, black (2.5Y 2.5/1)	31.6 ppm		Soil Sample 141221	
	2	silty SAND (SM), 15-20% silt, fine to medium grained, well rounded, loose, moist, gray (2.5Y 6/1)				
	3		N/A			
	4					
	5	CLAY (CL), firm, medium plasticity, medium toughness, moist, dark greenish gray (2GLEY 4/1)				
	6		8.5 ppm			
	7					
	8		11.3 ppm			
	9					
	10					

HTRW DRILLING LOG

HOLE NUMBER 14-12

PROJECT: Fort Stewart USTs | INSPECTOR | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11	CLAY (CL): as above	7.7 ppm			
	12					
	13		9.6ppm		Soil Sample 141211	
	14					
	15					▽ wet below 15.0 ft BGS
	16	Silty SAND (SW-SM), 10-15% silt, fine to medium grained, well rounded, loose, wet, light greenish gray (1GLEY 7/1)	N/A	Soil Sample 141231		
	17					
	18					
	19		N/A			
	20					END OF DRILLING AT 20.0 FT BGS

APPENDIX C

WELL CONSTRUCTION DIAGRAMS

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MONITORING WELL

PROJECT:

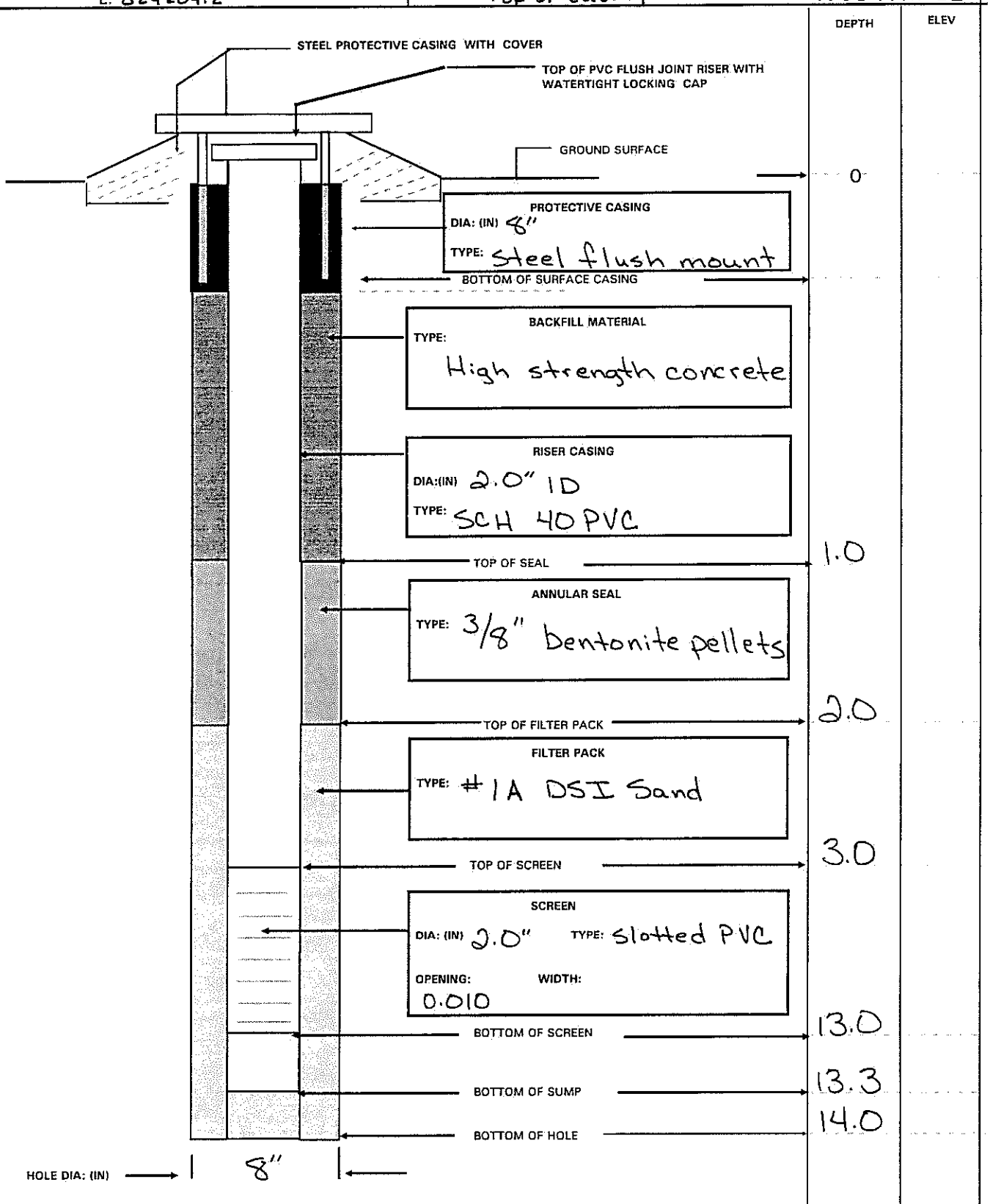
WELL NUMBER: 14-07

BEGIN: 11/14/97 **END:** 11/14/97

COORDINATES: N: 680864.8
E: 824209.2

REFERENCE POINT: Top of Casing

ELEVATION: 71.06 ft AMSL



MONITORING WELL

PROJECT:

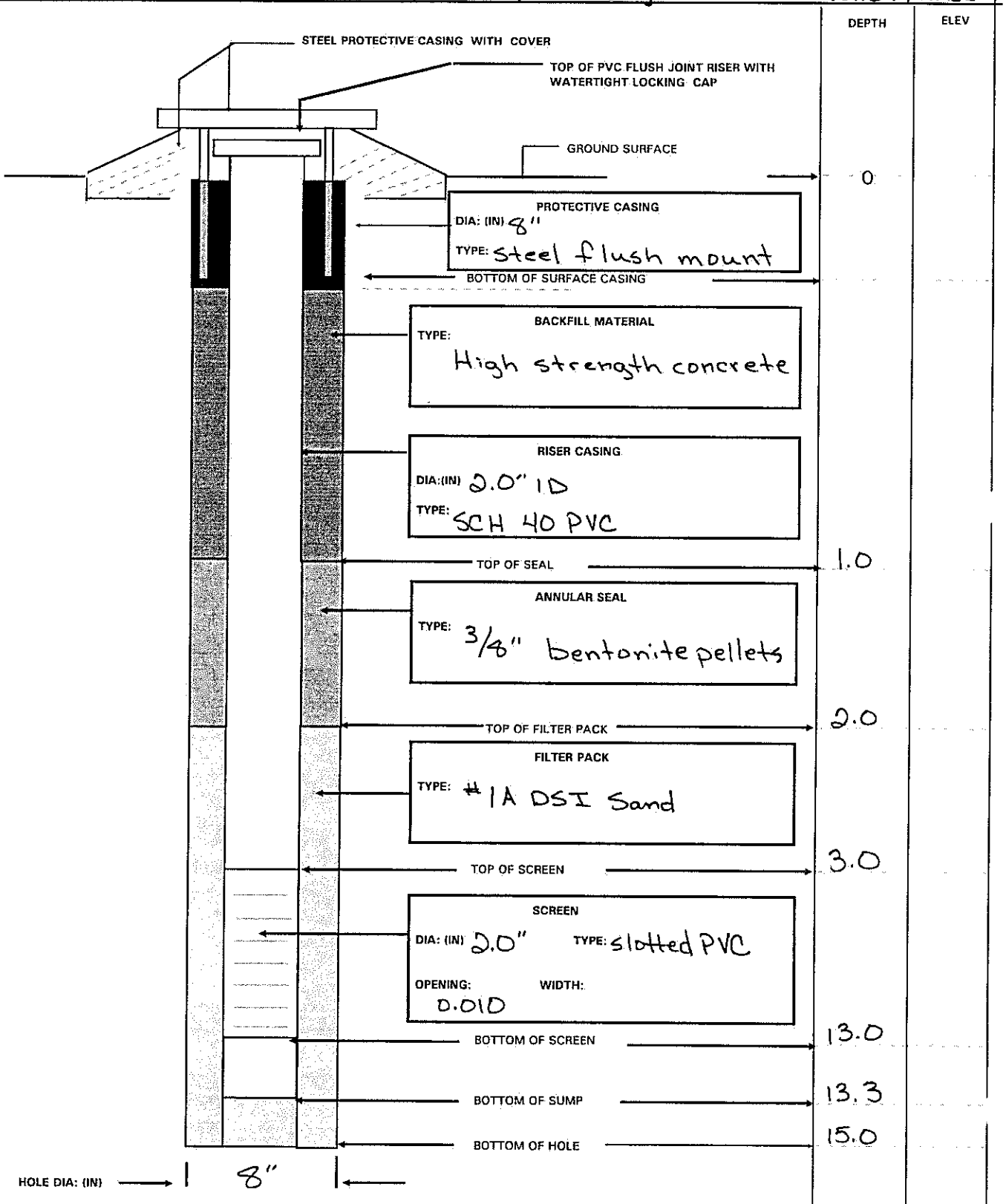
WELL NUMBER: 14-08

BEGIN: 11/14/97 **END:** 11/14/97

COORDINATES: N: 680799.8 E: 824139.7

REFERENCE POINT: MSL Top of casing

ELEVATION: 70.18 ft AMSL



MONITORING WELL

PROJECT:

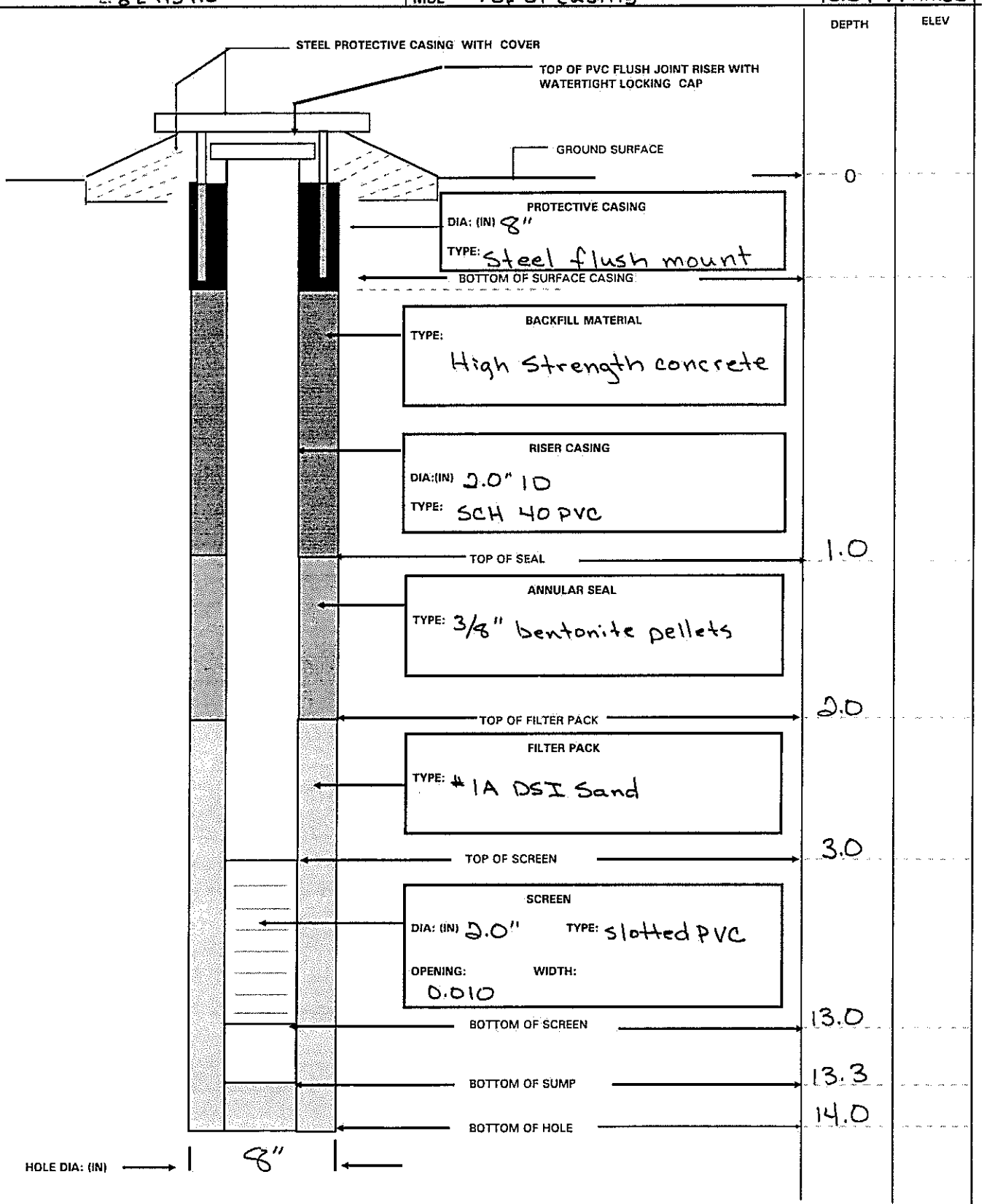
WELL NUMBER: 14-09

BEGIN: 11/14/97 **END:** 11/14/97

COORDINATES: N: 680841.1
E: 824159.0

REFERENCE POINT: MSL Top of casing

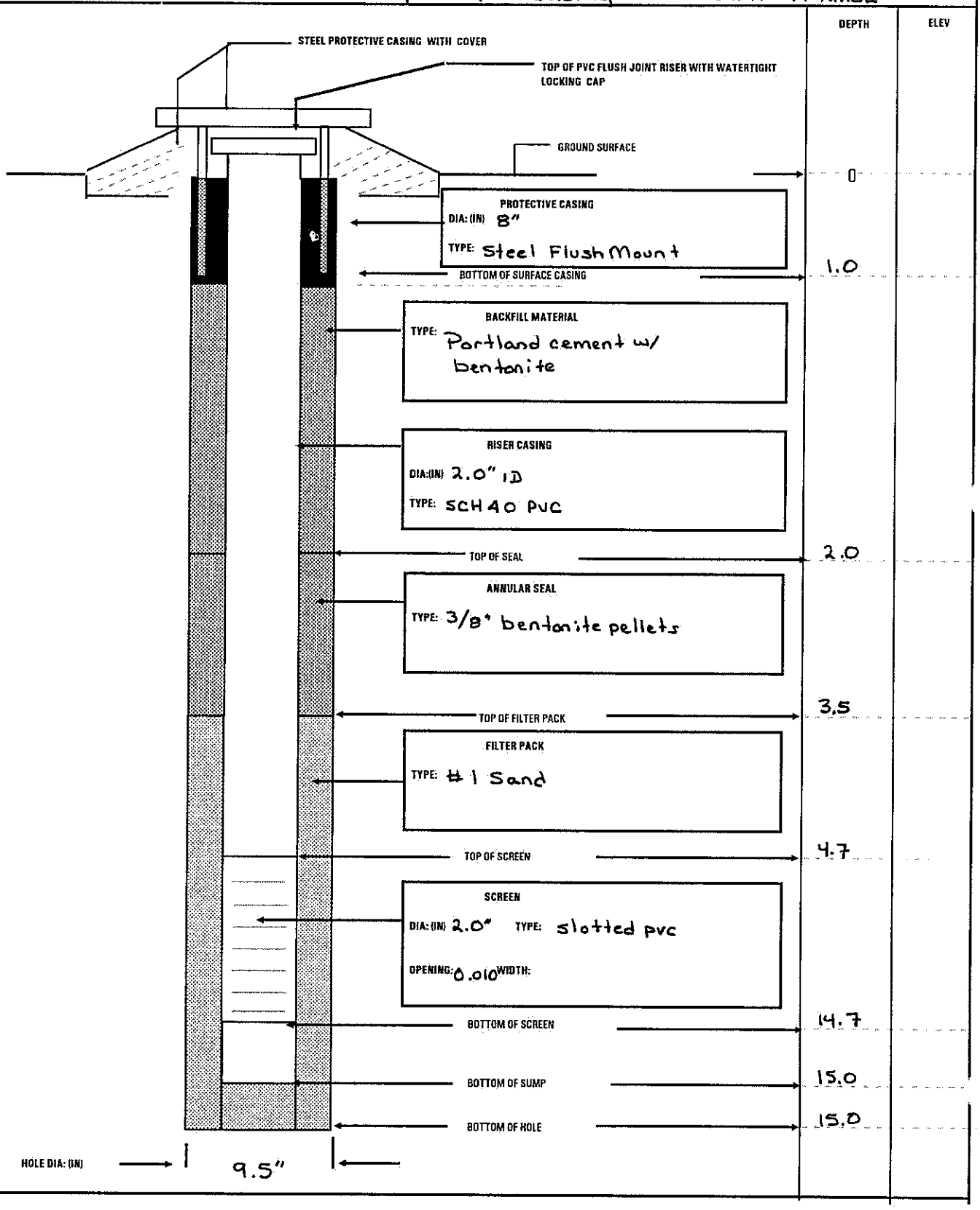
ELEVATION: 70.59 ft AMSL



MONITORING WELL

PROJECT:

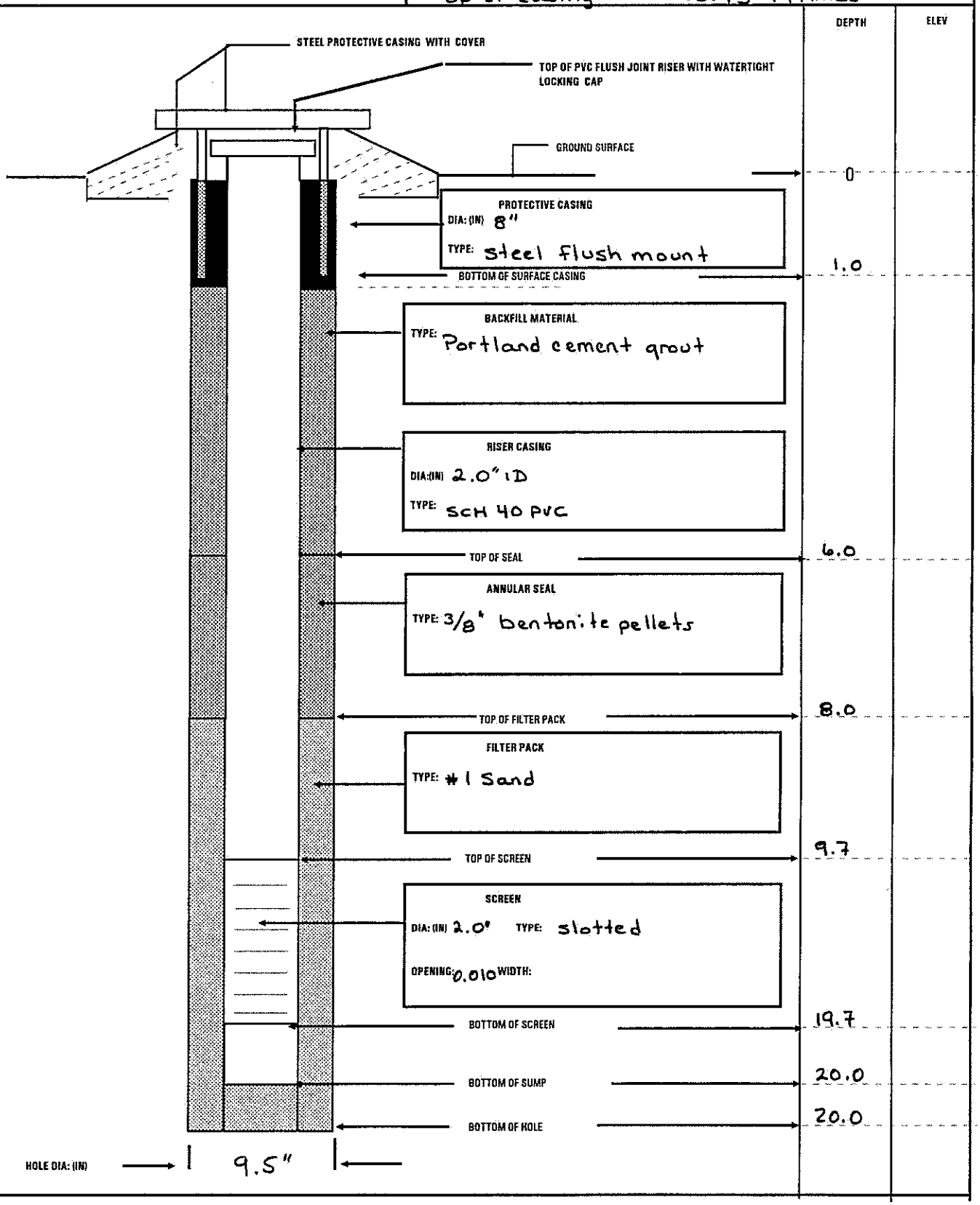
WELL NUMBER: 14-11	**BEGIN:** 11/14/98	**END:** 11/15/98
COORDINATES: N: 680835.0 E: 824112.0	**REFERENCE POINT:** Top of Casing	**ELEVATION:** 69.91 ft AMSL



MONITORING WELL

PROJECT:

'ELL NUMBER: 14-12	BEGIN: 11/14/98	END: 11/15/98
COORDINATES: N: 680921.8 E: 824140.4	REFERENCE POINT: Top of casing	ELEVATION: 70.73 ft AMSL



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APPENDIX D

HYDROGEOLOGIC DATA

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D.1 SOIL GEOTECHNICAL DATA

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TA 2.3

SUMMARY TABLE OF RESULTS FOR CAP Part B

SAMPLE NO.	MOISTURE CONTENT (%)	ATTERBERG LIMITS FINES CLASSIFICATION LL	PL	PI		SIEVE ANALSIS (% PASSING) 3"	2"	1 1/2"	3/4"	3/8"	#4	#10	#20	#40	#60	#140	#200
141031	12.7	NONPLASTIC				100	100	100	100	100	98.9	91.3	56.2	31.8	18.0	0.8	0.5
260631	33.2	NONPLASTIC				100	100	100	100	97.8	94.3	92.3	88.8	81.7	65.9	3.2	2.1
300831	28.7	28.5	21.5	7.0	CL-ML	100	100	100	100	100	99.0	74.0	55.5	44.9	28.1	3.4	1.8
320631	26.1	NONPLASTIC				100	100	100	100	100	100	96.0	92.6	88.5	78.0	3.7	1.7
330631	19.9	NONPLASTIC				100	100	100	100	100	100	89.28	75.3	67.0	60.0	8.6	3.2
480931	18.1	NONPLASTIC				100	100	100	100	100	100	89.6	43.9	8.9	1.4	0.3	0.1
031031	24.3	26.3	14	12.3	CL	100	100	100	100	100	100	100	82.6	67.4	48.4	7.6	4.7
140731	50.4	118.3	32.5	85.8	CH	100	100	100	100	100	100	98.8	95.0	94.3	94.0	92.7	92.3
140831	25.0	NONPLASTIC				100	100	100	100	99.8	97.2	91	74.1	50.0	25.7	1.5	0.6
151331	9.0	NONPLASTIC				100	100	100	100	100	100	99.7	71.3	51.0	35.5	3.2	2.2
151431	19.2	NONPLASTIC				100	100	100	100	100	99.8	99.2	88.1	77.6	61.4	2.6	1.9
260731	8.2	NONPLASTIC				100	100	100	100	100	100	100	97.8	88.8	69.6	3.4	2.5
260831	24.0	NONPLASTIC				100	100	100	100	100	100	100	98.9	93.2	82.6	4.3	3.4
260931	10.8	NONPLASTIC				100	100	100	100	100	100	99.9	98.3	95.5	85.3	3.1	5.4
300731	23.1	22.7	15.8	6.9	CL-ML	100	100	100	100	100	93.8	68.9	50.2	38.6	27.8	8.9	6.2
300931	35.7	34.8	11.5	23.3	CL	100	100	100	100	100	80.1	51.9	36.9	27.9	20.2	4.2	3.4
320731	7.0	NONPLASTIC				100	100	100	100	94.3	90.7	87.7	73.3	53.3	36.8	4.3	2.6
320831	20.3	NONPLASTIC				100	100	100	100	100	99.8	97.2	84.6	51.2	19.1	1.5	0.6
320931	35.7	NONPLASTIC				100	100	100	100	100	100	98.3	87.1	71.4	50.2	2.1	1.0
330731	14.3	NONPLASTIC				100	100	100	100	100	99.1	98.9	80.8	65.2	47.8	7.7	5.7
330831	35.8	NONPLASTIC				100	100	100	100	97.1	90.9	73.4	49.1	33.6	23.0	4.3	11.1
330931	13.6	NONPLASTIC				100	100	100	100	95.8	81.0	62.9	47.2	35.9	25.1	2.7	2.0
480731	23.1	23.0	18.7	4.3	CL-ML	100	100	100	100	100	100	91.9	72.3	64.4	58.7	15.0	6.1
480831	14.7	NONPLASTIC				100	100	100	100	100	97.6	83.2	63.9	34.9	14.5	1.7	0.0

SAMPLE NO.	PERMEABLITY k (cm/sec)	POROSITY	SPECIFIC GRAVITY
141031	1.72E-05	0.49	2.76
260631	4.68E-04	0.42	2.65
300831	1.39E-07	0.60	2.64
320631	1.10E-03	0.50	2.63
330631	2.84E-06	0.32	2.63
480931	8.94E-04	0.31	2.65

John Jones, P.E.
Laboratory Manager

CATLIN Engineers and Scientists
Geotechnical Laboratories

ATTERBERG LIMITS DETERMINATION (ASTM D4318-93)

Project Fort Stewart Job No. 97223

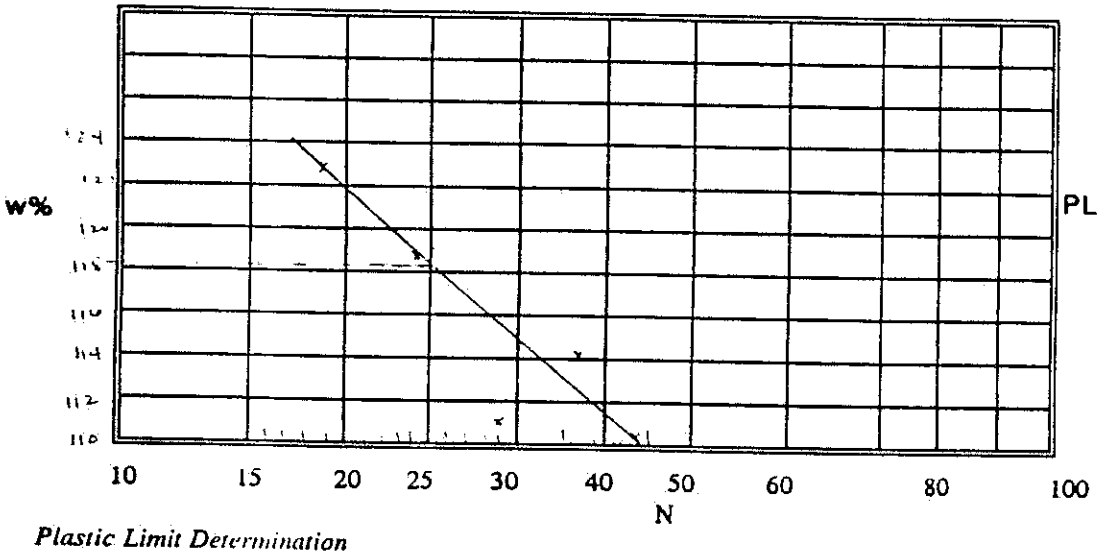
Location of Project Fort Stewart, GA : CAP part B Boring No. _____ Sample No. 140731

Description of Soil Lt. Gray Brown Clay

Depth of Sample 10 - 12.5' Tested By C.A Date of Testing 12/9/97

Liquid Limit Determination

Can no.	C22	C10	C8	C14	C15	
Wt. of soil + can, M_{cws}	7.38	7.78	9.20	8.78	9.90	
Wt. of dry soil + can, M_{cds}	4.76	4.91	5.54	5.33	5.76	
Wt. of can, M_c	2.39	2.40	2.43	2.43	2.43	
Wt. of dry soil, M_s	2.37	2.51	3.11	2.9	3.35	
Wt. of moisture	2.62	2.87	3.45	3.45	4.12	
Water content, w%	110.55%	114.34	110.93	118.97	122.99	
No. of blows, N	44	37	21	24	18	



LIQUID LIMIT = 118.3

PLASTIC LIMIT = 32.5

PLASTICITY INDEX = 85.8

CH

Plastic Limit Determination

Can no.	C13	C20	C8	
Wt. of wet soil + can, M_{cws}	2.44	2.62	2.48	
Wt. of dry soil + can, M_{cds}	2.31	2.45	2.34	
Wt. of can, M_c	1.90	1.91	1.91	
Wt. of dry soil, M_s	0.41	0.54	0.43	
Wt. of moisture, M_w	0.13	0.11	0.14	
Water content, w% = w_p	31.71	33.33	32.56	

PERMEABILITY TEST ANALYSIS (ASTM D5084)

Project : Fort Stewart, GA
Location of Project : CAP Part B
Description of Soil : Lt. Gray Medium Grain Sand w/ Organics

Job # : 97223
Date of Testing: 12/22-12/24/97
Tested by: BV-CA
Boring # :
Sample # : 141031
Sample Depth : 5-7ft.

Sample Type (Undisturbed or Remolded)
Standard Proctor:
Maximim Dry Density: _____ pcf
Optimum Moisture Content: _____ %

% Sample Compaction: _____ %
Sample Dry Density: _____ pcf
Sample Moisture Content: _____ %
Sample Wet Density: _____ pcf

Sample Permeation:

De-Aired Water
% Saturation: 100 %
Cell Pressure: 65 psi
Lower Pressure: 61 psi
Upper Pressure: 60 psi
Gradient: 7.73

Sample Dimensions		
	Before	After
Length (cm)	9.10	9.20
Diameter (cm)	7.20	7.30
Water Content (%)	12.7	12.9
Weight (g)	831.50	822.50

Constant Head Calculation:

$$K = [V(t_1,t_2)\, LR_T]/[P_B A t] \text{ (cm/sec)}$$

$V(t_1,t_2)$ = Volume of flow from t_1 to t_2 (cm^2)
L = Length of Sample = 9.10 cm
A = Area of Sample = 40.72 cm^2
t = $t_2 - t_1$ (sec)
P_B = Bias Pressure = 1 psi x 70.37 cm/psi $_{(cm - H2O)}$ 70.37 cm
R_T = Temperature correction = 0.931

t_2 (min)	t_1 (min)	$(t_2 - t_1)*60$ (sec)	V (cm^3)	$[LR_T]/[P_B A]$ (cm^3)	K (cm/sec)
6	5	60	0.4	2.96E-03	1.97E-05
7	6	60	0.3	2.96E-03	1.48E-05
8	7	60	0.4	2.96E-03	1.97E-05
9	8	60	0.3	2.96E-03	1.48E-05

K_{avg} = 1.72E-05 cm/sec

CATLIN Engineers and Scientists
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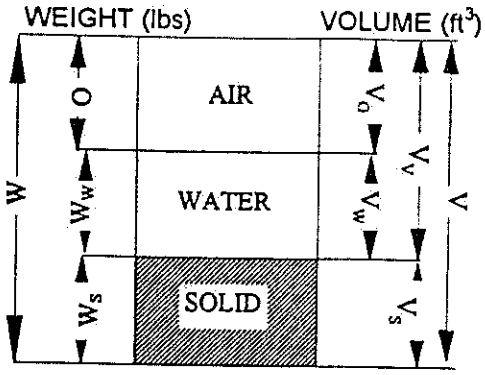
SPECIFIC GRAVITY AND POROSITY

PROJECT: FORT STEWART,GA
LOCATION OF PROJECT: CAP Part B
DESCRIPTION OF SOIL: Gray, Sand w Organics
TESTED BY: c. agustin

JOB NO.: 97223
SAMPLE NO.: 141031
DEPTH OF SAMPLE: 5-7 ft.
DATE OF TESTING: 12/15/97



W = 1.88646
$W_W = W - W_S$ = 0.34751
$W_S = Y_d * V$ = 1.5390

V = 0.01740
$V_W = W_W/Y_W$ = 0.0056
$V_S = W_S/G_S * Y_W$ = 0.0089
$V_G = V - (V_S + V_V)$ = 0.00290
$V_V = V_G + V_W$ 0.0085

MEASUREMENTS OF TUBE/CAN

HEIGHT= 12.1 cm
DIAMETER= 7.2 cm

CALCULATED VOLUME OF TUBE/CAN

V= 492.65 cm^3
0.01740 ft^3

WT. OF TUBE/CAN + WET SOIL= 1175.20 g
WEIGHT OF TUBE/CAN= 319.5 g
WEIGHT OF WET SOIL= 855.70 g
W = 1.88646 lb

MOISTURE CONTENT

M_{CWS} = 159.20 g
M_{CDS} = 138.90 g
M_W = 20.30 g
M_C = 49.00 g
M_S = 89.90 g
w = 22.6 %

Wet Density, $Y_m = W / V$

Dry Density, $Y_d = W_s / V$ or $Y_d = Y_m / (1+ w)$	
double check	$Y_d = Y_m / (1+ w)$
$Y_d = W_s / V$	Y_m= 108.41 lbs/ft^3
Y_d= 88.44 lbs/ft^3	Y_d= 88.44 lbs/ft^3

Void Ratio, $e = V_V/V_S$
e = 0.9482

Porosity, $n = V_V / V$
n = 0.49

Specific Gravity = 2.76

Degree of Saturation, $S = V_w/V_v$
S = 0.6573

TABLE 2.0
SUMMARY TABLE OF RESULTS FOR CAP Part A And CAP Part B

SAMPLE NO.	MOISTURE CONTENT (%)	ATTERBERG LIMITS FINES CLASSIFICATION LL	PL	PI
31131	16.2	NONPLASTIC		
→ 141131	20.0	NONPLASTIC		
→ 141231	20.3	NONPLASTIC		
321031	24.5	NONPLASTIC		
321131	23.0	NONPLASTIC		
321231	24.0	NONPLASTIC		
331031	19.6	NONPLASTIC		
421031	24.7	NONPLASTIC		
160731	24.9	NONPLASTIC		
600831	14.9	NONPLASTIC		
630831	13.9	NONPLASTIC		
650631	18.3	NONPLASTIC		
670331	38.3	NONPLASTIC		
680331	18.4	NONPLASTIC		

SIEVE ANALYSIS (% PASSING)

3"	2"	1 1/2"	3/4"	3/8"	#4	#10	#20	#40	#60	#140	#200
100	100	100	100	100	100	99.7	85.0	46.3	17.7	9.0	8.7
100	100	100	100	100	99.1	98.3	96.4	93.6	83.4	13.0	8.0
100	100	100	100	100	99.9	99.8	99.1	92.4	63.1	8.8	6.7
100	100	100	100	100	100	99.4	98.4	96.7	91.6	14.1	10.3
100	100	100	100	100	99.9	99.5	96.3	93.1	88.8	8.5	6.1
100	100	100	100	100	100	99.5	98.3	95.7	80.0	6.6	5.1
100	100	100	100	100	100	98.5	80.4	62.1	48.4	16.7	15.0
100	100	100	100	100	100	100	99.2	89.3	68.4	25.4	23.6
100	100	100	100	100	100	99.8	99.2	97.7	76.7	14.6	13.9
100	100	100	100	100	93.5	91.1	87.8	73.2	44.0	25.5	25.1
100	100	100	100	100	99.2	94.0	55.2	39.4	29.8	5.4	4.1
100	100	100	100	100	100	100	99.7	97.9	77.8	17.5	16.6
100	100	100	100	100	99.9	90.3	87	83.4	77.0	37.9	31.6
100	100	100	100	100	99.7	99.6	94.4	82.4	66.4	17.6	16.5

SAMPLE NO.	PERMEABLITY k (cm/sec)	POROSITY	SPECIFIC GRAVITY
160731	1.59E-04	0.23	2.66
600831	3.59E-05	0.35	2.65
630831	7.20E-04	0.25	2.64
650631	2.44E-04	0.57	2.63
670331	1.66-E-07	0.40	2.65
680331	2.54E-06	0.35	2.67

John Jones, P.E.
Laboratory Manager

CATLIN Engineers and Scientists
Geotechnical Laboratories

GRAIN SIZE ANALYSIS-SIEVE (ASTM D422)

Project: Fort Stewart	Job No.: 98066
Project Location: Cap Part B	Sample No.: 141131
Sample Description: Light Gray Silty Sand	Sample Depth: 10-12 ft.
	Boring No.:
Tested By: FB	Date of Testing: 12/1/98

Mcws	Mcds	Mc : A2	Mw	Ms	w%	Mws	Ms
17.27	17.25	15.32	0.02	1.93	1.0	200.15	198.10

Sieve No.	Diam. (mm)	Wt. retained	% retained	E % retained	% passing
3	76.2	0	0.00	0.00	100.00
2	50.8	0	0.00	0.00	100.00
1 1/2	25.4	0	0.00	0.00	100.00
3/4	19.05	0	0.00	0.00	100.00
3/8	9.51	0	0.00	0.00	100.00
4	4.76	1.71	0.86	0.86	99.14
10	2.00	1.57	0.79	1.66	98.34
20	0.841	3.95	1.99	3.65	96.35
40	0.42	5.46	2.76	6.41	93.59
60	0.25	20.25	10.22	16.63	83.37
140	0.106	139.5	70.42	87.05	12.95
200	0.074	9.86	4.98	92.03	7.97
pan	—	0.26	0.13	92.16	7.84
total		182.56			

CATLIN Engineers and Scientists
Geotechnical Laboratories

GRAIN SIZE ANALYSIS-SIEVE (ASTM D422)

Project: Fort Stewart	Job No.: 98066
Project Location: Cap Part B	Sample No.: 141231
Sample Description: Light Gray Silty Sand	Sample Depth: 15-17 ft.
	Boring No.:
Tested By: FB	Date of Testing: 12/1/98

Mcws	Mcds	Mc : A55	Mw	Ms	w%	Mws	Ms
18.36	18.35	15.00	0.01	3.35	0.3	200.00	199.40

Sieve No.	Diam. (mm)	Wt. retained	% retained	E % retained	% passing
3	76.2	0	0.00	0.00	100.00
2	50.8	0	0.00	0.00	100.00
1 1/2	25.4	0	0.00	0.00	100.00
3/4	19.05	0	0.00	0.00	100.00
3/8	9.51	0	0.00	0.00	100.00
4	4.76	0.21	0.11	0.11	99.89
10	2.00	0.28	0.14	0.25	99.75
20	0.841	1.32	0.66	0.91	99.09
40	0.42	13.26	6.65	7.56	92.44
60	0.25	58.51	29.34	36.90	63.10
140	0.106	108.24	54.28	91.18	8.82
200	0.074	4.31	2.16	93.34	6.66
pan	—	0.1	0.05	93.39	6.61
total		186.23			

CATLIN Engineers and Scientists
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D.2 SLUG TEST DATA

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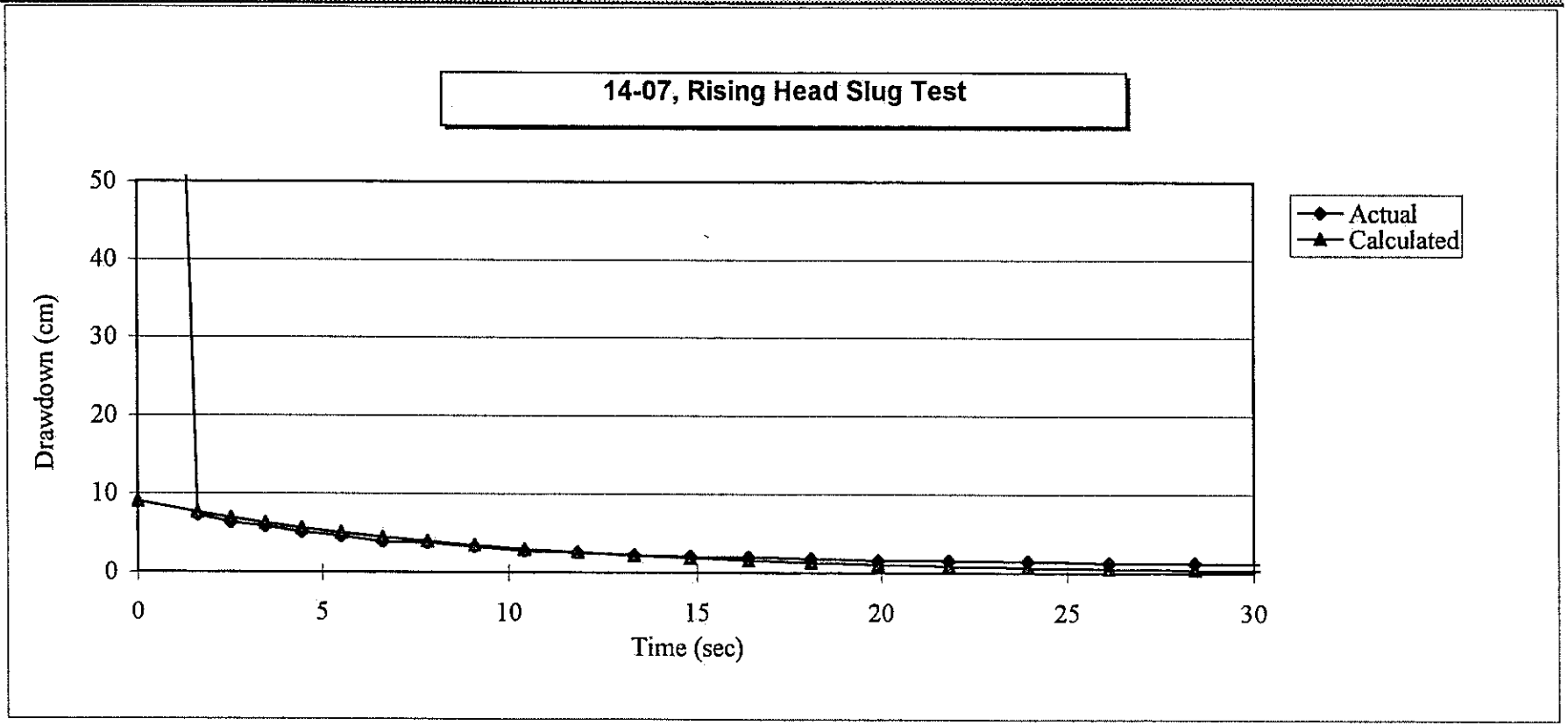
Slug Test Hydraulic Conductivity (K) Calculation

Well ID	**14-07**		Test Date	12/17/97			
Test Type	**Rising Head**		Evaluation Method	Bouwer & Rice			
Borehole Parameters			Calculation Parameters				
Pretest water level	3.48	ft bgs	Radius of casing (rc^2)	6.45	cm	ln R/rw	1.77
Casing inside diameter	2.00	in	Radius of borehole (rw)	11.43	cm		
Borehole diameter	9.00	in	Effective radius of investigation (Re)	304.80	cm		
Saturated thickness (H)	36.52	ft	Length of screen (Le)	304.80	cm		
Screen length (Le)	10.00	ft	Distance from static water level (Yo)	9.00	cm		
Saturated penetration (Lw)	9.52	ft	**Hydraulic conductivity (K)**	**2.00E-03**	**cm/sec**		



14-07 Rising Head Slug Test Hydraulic Conductivity Worksheet

Elapsed Time (min)	y=ft	Time(sec)	tadjust=0 (sec)	Yt (cm)	(2*Le*K*t)/(rc^2*ln(Re/rw))	Ycalc (cm)
0.0000	8.6581	0.00	0.00	263.9000	0.0000	9.00E+00
0.0271	0.2362	1.63	1.63	7.2000	0.1732	7.57E+00
0.0420	0.2067	2.52	2.52	6.3000	0.2685	6.88E+00
0.0576	0.1903	3.46	3.46	5.8000	0.3682	6.23E+00
0.0743	0.1673	4.46	4.46	5.1000	0.4749	5.60E+00
0.0920	0.1509	5.52	5.52	4.6000	0.5880	5.00E+00
0.1106	0.1280	6.64	6.64	3.9000	0.7069	4.44E+00
0.1305	0.1214	7.83	7.83	3.7000	0.8341	3.91E+00
0.1515	0.1050	9.09	9.09	3.2000	0.9684	3.42E+00
0.1736	0.0886	10.42	10.42	2.7000	1.1096	2.97E+00
0.1971	0.0820	11.83	11.83	2.5000	1.2598	2.55E+00
0.2220	0.0722	13.32	13.32	2.2000	1.4190	2.18E+00
0.2470	0.0689	14.82	14.82	2.1000	1.5788	1.86E+00
0.2736	0.0656	16.42	16.42	2.0000	1.7488	1.57E+00
0.3020	0.0591	18.12	18.12	1.8000	1.9303	1.31E+00
0.3320	0.0525	19.92	19.92	1.6000	2.1221	1.08E+00
0.3636	0.0525	21.82	21.82	1.6000	2.3240	8.81E-01
0.3986	0.0492	23.92	23.92	1.5000	2.5478	7.04E-01
0.4353	0.0427	26.12	26.12	1.3000	2.7823	5.57E-01
0.4736	0.0427	28.42	28.42	1.3000	3.0271	4.36E-01
0.5153	0.0394	30.92	30.92	1.2000	3.2937	3.34E-01
0.5586	0.0361	33.52	33.52	1.1000	3.5704	2.53E-01
0.6053	0.0361	36.32	36.32	1.1000	3.8689	1.88E-01
0.6536	0.0361	39.22	39.22	1.1000	4.1777	1.38E-01
0.7053	0.0361	42.32	42.32	1.1000	4.5081	9.92E-02
0.7603	0.0295	45.62	45.62	0.9000	4.8597	6.98E-02
0.8186	0.0262	49.12	49.12	0.8000	5.2323	4.81E-02
0.8803	0.0262	52.82	52.82	0.8000	5.6267	3.24E-02
0.9453	0.0262	56.72	56.72	0.8000	6.0421	2.14E-02

14-07 Rising Head Slug Test Hydraulic Conductivity Worksheet

Elapsed Time (min)	y=ft	Time(sec)	tadjust=0 (sec)	Yt (cm)	(2*Le*K*t)/(rc^2*ln(Re/rw))	Ycalc (cm)
1.0153	0.0197	60.92	60.92	0.6000	6.4896	1.37E-02
1.0886	0.0197	65.32	65.32	0.6000	6.9581	8.56E-03
1.1670	0.0197	70.02	70.02	0.6000	7.4592	5.19E-03
1.2503	0.0197	75.02	75.02	0.6000	7.9916	3.04E-03
1.3386	0.0197	80.32	80.32	0.6000	8.5560	1.73E-03
1.4320	0.0197	85.92	85.92	0.6000	9.1530	9.53E-04
1.5303	0.0131	91.82	91.82	0.4000	9.7813	5.08E-04
1.6353	0.0131	98.12	98.12	0.4000	10.4525	2.60E-04
1.7453	0.0131	104.72	104.72	0.4000	11.1556	1.29E-04
1.8620	0.0131	111.72	111.72	0.4000	11.9015	6.10E-05
1.9870	0.0131	119.22	119.22	0.4000	12.7004	2.74E-05
2.1186	0.0131	127.12	127.12	0.4000	13.5416	1.18E-05
2.2586	0.0098	135.52	135.52	0.3000	14.4365	4.84E-06
2.4070	0.0131	144.42	144.42	0.4000	15.3850	1.87E-06
2.5636	0.0131	153.82	153.82	0.4000	16.3859	6.89E-07
2.7303	0.0098	163.82	163.82	0.3000	17.4515	2.37E-07
2.9070	0.0098	174.42	174.42	0.3000	18.5809	7.67E-08
3.0936	0.0098	185.62	185.62	0.3000	19.7736	2.33E-08
3.2920	0.0098	197.52	197.52	0.3000	21.0417	6.55E-09
3.5020	0.0098	210.12	210.12	0.3000	22.3840	1.71E-09
3.7236	0.0098	223.42	223.42	0.3000	23.8004	4.15E-10
3.9586	0.0131	237.52	237.52	0.4000	25.3025	9.24E-11
4.2070	0.0098	252.42	252.42	0.3000	26.8902	1.89E-11
4.4703	0.0098	268.22	268.22	0.3000	28.5731	3.51E-12
4.7503	0.0098	285.02	285.02	0.3000	30.3628	5.86E-13
5.0470	0.0098	302.82	302.82	0.3000	32.2593	8.79E-14
5.3603	0.0098	321.62	321.62	0.3000	34.2618	1.19E-14

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APPENDIX E

GROUNDWATER TRANSPORT MODELING DATA

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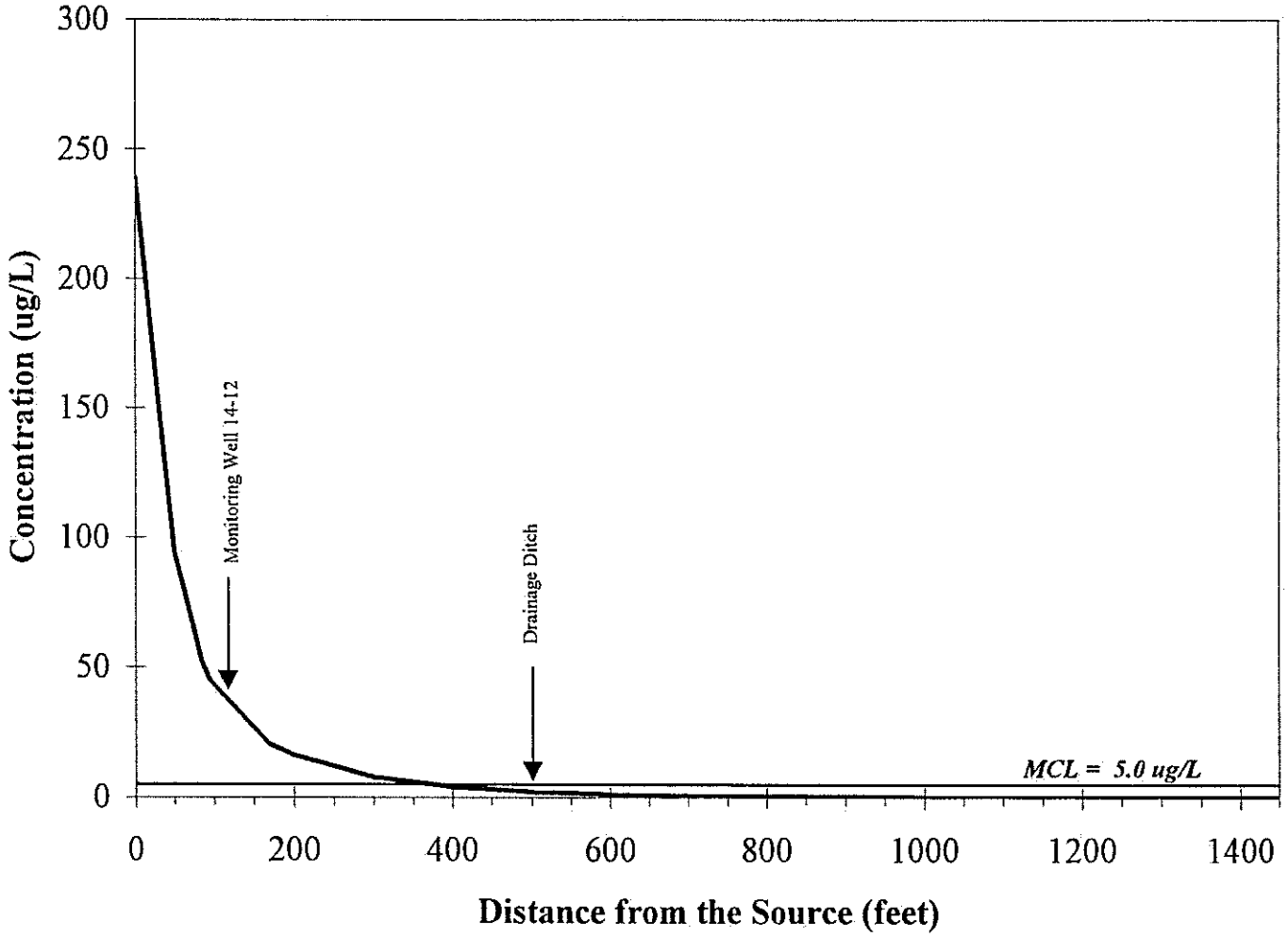
AT123D modeled maximum concentration of benzene in the groundwater versus lateral distance from the source (UST 29)



Ft Stewart UST 29 Benzene (calibrated plume)

NO. OF POINTS IN X-DIRECTION	7
NO. OF POINTS IN Y-DIRECTION	5
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	12
NO. OF ENDING TIME STEP	200
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT	1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD	2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS)	0.1128E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.6100E+01
END POINT OF X-SOURCE LOCATION (METERS)	0.0000E+00
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.3050E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.3050E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00

POROSITY	0.2000E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.7200E-01
HYDRAULIC GRADIENT	0.1200E-01
LONGITUDINAL DISPERSIVITY (METER)	0.1500E+02
LATERAL DISPERSIVITY (METER)	0.5000E+01
VERTICAL DISPERSIVITY (METER)	0.1500E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.1620E-03
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)	0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR)	0.3530E-05
DECAY CONSTANT (PER HOUR)	0.4012E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1500E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE	0.1000E-02
DENSITY OF WATER (KG/M**3)	0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR)	0.7300E+03
DISCHARGE TIME (HR)	0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.3400E-04

RETARDATION FACTOR	0.2215E+01
RETARDED DARCY VELOCITY (M/HR)	0.1950E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.2926E-01
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.9760E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.2933E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8030E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.142E+00	0.557E-01	0.226E-01	0.171E-01	0.169E-02	0.000E+00	0.000E+00
4.	0.166E+00	0.604E-01	0.238E-01	0.180E-01	0.175E-02	0.000E+00	0.000E+00
3.	0.188E+00	0.646E-01	0.248E-01	0.187E-01	0.180E-02	0.000E+00	0.000E+00
2.	0.205E+00	0.678E-01	0.256E-01	0.192E-01	0.184E-02	0.000E+00	0.000E+00
0.	0.221E+00	0.705E-01	0.263E-01	0.197E-01	0.187E-02	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1679E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.155E+00	0.713E-01	0.377E-01	0.316E-01	0.889E-02	0.656E-06	0.000E+00
4.	0.178E+00	0.765E-01	0.393E-01	0.328E-01	0.909E-02	0.666E-06	0.000E+00
3.	0.200E+00	0.809E-01	0.406E-01	0.338E-01	0.925E-02	0.674E-06	0.000E+00
2.	0.218E+00	0.842E-01	0.415E-01	0.345E-01	0.936E-02	0.679E-06	0.000E+00
0.	0.234E+00	0.871E-01	0.423E-01	0.351E-01	0.946E-02	0.684E-06	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2555E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.158E+00	0.761E-01	0.431E-01	0.372E-01	0.141E-01	0.366E-04	0.000E+00
4.	0.182E+00	0.812E-01	0.448E-01	0.385E-01	0.143E-01	0.369E-04	0.000E+00
3.	0.204E+00	0.857E-01	0.461E-01	0.395E-01	0.145E-01	0.372E-04	0.000E+00
2.	0.221E+00	0.891E-01	0.471E-01	0.402E-01	0.147E-01	0.374E-04	0.000E+00
0.	0.237E+00	0.920E-01	0.479E-01	0.408E-01	0.148E-01	0.376E-04	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3431E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.159E+00	0.779E-01	0.454E-01	0.396E-01	0.169E-01	0.226E-03	0.000E+00
4.	0.183E+00	0.831E-01	0.470E-01	0.408E-01	0.172E-01	0.227E-03	0.000E+00
3.	0.205E+00	0.875E-01	0.484E-01	0.418E-01	0.174E-01	0.229E-03	0.000E+00
2.	0.223E+00	0.909E-01	0.494E-01	0.426E-01	0.175E-01	0.230E-03	0.000E+00
0.	0.238E+00	0.938E-01	0.502E-01	0.432E-01	0.177E-01	0.231E-03	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4307E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.786E-01	0.463E-01	0.406E-01	0.183E-01	0.587E-03	0.000E+00
4.	0.183E+00	0.838E-01	0.480E-01	0.418E-01	0.186E-01	0.591E-03	0.000E+00
3.	0.205E+00	0.883E-01	0.493E-01	0.429E-01	0.188E-01	0.595E-03	0.000E+00
2.	0.223E+00	0.917E-01	0.503E-01	0.436E-01	0.190E-01	0.597E-03	0.000E+00
0.	0.239E+00	0.946E-01	0.512E-01	0.442E-01	0.191E-01	0.599E-03	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5183E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.790E-01	0.468E-01	0.410E-01	0.190E-01	0.101E-02	0.000E+00
4.	0.184E+00	0.842E-01	0.484E-01	0.423E-01	0.193E-01	0.101E-02	0.000E+00
3.	0.205E+00	0.886E-01	0.498E-01	0.433E-01	0.195E-01	0.102E-02	0.000E+00
2.	0.223E+00	0.920E-01	0.508E-01	0.441E-01	0.197E-01	0.102E-02	0.000E+00
0.	0.239E+00	0.949E-01	0.516E-01	0.447E-01	0.198E-01	0.103E-02	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6059E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.791E-01	0.470E-01	0.413E-01	0.193E-01	0.138E-02	0.000E+00
4.	0.184E+00	0.843E-01	0.486E-01	0.425E-01	0.196E-01	0.139E-02	0.000E+00
3.	0.206E+00	0.888E-01	0.500E-01	0.435E-01	0.198E-01	0.140E-02	0.000E+00
2.	0.223E+00	0.922E-01	0.510E-01	0.443E-01	0.200E-01	0.140E-02	0.000E+00
0.	0.239E+00	0.951E-01	0.518E-01	0.449E-01	0.201E-01	0.140E-02	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6935E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.195E-01	0.167E-02	0.000E+00
4.	0.184E+00	0.844E-01	0.487E-01	0.426E-01	0.198E-01	0.167E-02	0.000E+00
3.	0.206E+00	0.888E-01	0.501E-01	0.436E-01	0.200E-01	0.168E-02	0.000E+00
2.	0.223E+00	0.923E-01	0.511E-01	0.444E-01	0.202E-01	0.169E-02	0.000E+00
0.	0.239E+00	0.952E-01	0.519E-01	0.450E-01	0.203E-01	0.169E-02	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7811E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.195E-01	0.186E-02	0.000E+00
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.198E-01	0.187E-02	0.000E+00
3.	0.206E+00	0.889E-01	0.501E-01	0.437E-01	0.201E-01	0.188E-02	0.000E+00
2.	0.223E+00	0.923E-01	0.511E-01	0.445E-01	0.202E-01	0.188E-02	0.000E+00
0.	0.239E+00	0.952E-01	0.519E-01	0.451E-01	0.204E-01	0.188E-02	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8687E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.198E-02	0.000E+00
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.199E-02	0.000E+00
3.	0.206E+00	0.889E-01	0.501E-01	0.437E-01	0.201E-01	0.200E-02	0.000E+00
2.	0.223E+00	0.923E-01	0.511E-01	0.445E-01	0.203E-01	0.200E-02	0.000E+00
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.201E-02	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9563E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.206E-02	0.000E+00
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.207E-02	0.000E+00
3.	0.206E+00	0.889E-01	0.501E-01	0.437E-01	0.201E-01	0.208E-02	0.000E+00
2.	0.223E+00	0.923E-01	0.511E-01	0.445E-01	0.203E-01	0.208E-02	0.000E+00
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.208E-02	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1044E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.210E-02	0.154E-10
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.211E-02	0.154E-10
3.	0.206E+00	0.889E-01	0.501E-01	0.437E-01	0.201E-01	0.212E-02	0.154E-10
2.	0.223E+00	0.923E-01	0.512E-01	0.445E-01	0.203E-01	0.213E-02	0.154E-10
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.213E-02	0.155E-10

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1132E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.213E-02	0.137E-09
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.214E-02	0.137E-09
3.	0.206E+00	0.889E-01	0.502E-01	0.437E-01	0.201E-01	0.215E-02	0.137E-09
2.	0.223E+00	0.923E-01	0.512E-01	0.445E-01	0.203E-01	0.215E-02	0.138E-09
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.216E-02	0.138E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1219E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.214E-02	0.639E-09
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.215E-02	0.641E-09
3.	0.206E+00	0.889E-01	0.502E-01	0.437E-01	0.201E-01	0.216E-02	0.642E-09
2.	0.223E+00	0.923E-01	0.512E-01	0.445E-01	0.203E-01	0.217E-02	0.642E-09
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.217E-02	0.643E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1307E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.215E-02	0.226E-08
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.216E-02	0.226E-08
3.	0.206E+00	0.889E-01	0.502E-01	0.437E-01	0.201E-01	0.217E-02	0.227E-08
2.	0.223E+00	0.923E-01	0.512E-01	0.445E-01	0.203E-01	0.217E-02	0.227E-08
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.218E-02	0.227E-08

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1394E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1620E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X = 0.	15.	26.	29.	52.	152.	610.
5.	0.160E+00	0.792E-01	0.471E-01	0.414E-01	0.196E-01	0.216E-02	0.637E-08
4.	0.184E+00	0.844E-01	0.488E-01	0.427E-01	0.199E-01	0.217E-02	0.638E-08
3.	0.206E+00	0.889E-01	0.502E-01	0.437E-01	0.201E-01	0.217E-02	0.639E-08
2.	0.223E+00	0.923E-01	0.512E-01	0.445E-01	0.203E-01	0.218E-02	0.639E-08
0.	0.239E+00	0.952E-01	0.520E-01	0.451E-01	0.204E-01	0.218E-02	0.640E-08

APPENDIX F

PUBLIC NOTIFICATION

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STATE OF GEORGIA
CHATHAM COUNTY

Affidavit of Publication
___Savannah Morning News
___Savannah Evening Press

Personnally appeared before me, Joan T. Jenkins, to me known, who being sworn, deposes and says:

That he is the Classified Adv Supv of Southeastern Newspapers Corporation, a Georgia corporation, doing business in Chatham County, Georgia, under the trade name of Savannah Morning News/Savannah Evening Press, a daily newspaper published in said county;

That he is authorized to make affidavits of publication on behalf of said published corporation;

That said newspaper is of general circulation in said county and in the area adjacent thereto;

That he has reviewed the regular editions of the Savannah Morning News/Savannah Evening Press, published on 2-8, 1998, 2-15, 1998, _____, 1998, _____, 1998, and finds that the following Advertisement, to-wit:

Miscellaneous Notices 015

PUBLIC NOTICE
Notification of Corrective Action Plan, Underground Storage Tank Releases, Fort Stewart Garrison Area, Fort Stewart, Ga.

The United States Army Corps of Engineers and Fort Stewart Directorate of Public Works have prepared Corrective Action Plan (CAP) Part B reports to assess the environmental impact of diesel, gasoline, or waste oil releases from numerous underground storage tanks (USTs) located at the above referenced property. These reports will be submitted to the Georgia Environmental Protection Division on or before February 17, 1998. A list of the UST sites for which CAP Part B reports have been prepared is presented at the end of this notification.

Georgia rules for UST Management require notification of the public most directly affected by the plans. If you would like a copy of any of the plans, please contact Commander, 3rd Infantry Division (Mechanized) and Fort Stewart, Attn: AFZP-DEV (T. Rutland), Building 1139, Fort Stewart, Ga. 31314-5000.

A copy of each requested plan will be mailed at a nominal copying and shipping fee.

To make comments on any of the plans, or to examine the Georgia Environmental Protection Division's files, contact the Corrective Action Unit, Underground Storage Tank Management Program, Environmental Protection Division at 404-362-2687. The Underground Storage Tank Management Program will accept public comments on the CAP Part B reports up to 30 days after submittal to the Georgia Environmental Protection Division. Following is their mailing address:

Corrective Action Unit, Underground Storage Tank Management Program, 4244 International Parkway, Suite 100, Atlanta, Ga. 30354

Fort Stewart CAP Part B

Underground Storage Tank Sites

Facility ID Number, Building Number, Tank Number
9.089068; 1810 11 and 12
9.089088; 1636/1634, 29
9.089028; 1622, 33, 34, and 35
9.089019; 955; 10
9.089025; 1213, 77 and 78
9.089029; 1281, 82
9.089074; 1247, 89
9.089075; 1333, 90 and 91
9.089077; 1325, 95, 96, and 97
9.089036; 275; 208 and 209

appeared in each of said editions.

Joan T. Jenkins
(Deponent)

Sworn to and subscribed before me this 16 day of Feb, 1998.

Lillie D. Lang
Notary Public, Chatham County, Georgia

LILLIE D. LANG
Notary Public, Chatham County, Ga.
My Commission Expires Apr. 8, 2001

Form 121 rev.

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