FINAL

CORRECTIVE ACTION PLAN (CAP)
PART B
UNDERGROUND STORAGE TANK 70
FACILITY ID: 9-089019
FORT STEWART, GEORGIA

Prepared for:
U.S. Army Corps of Engineers
Savannah District
Under Contract Number DACA21-95-D-022
Delivery Order No. 0016

Prepared by:
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

August 1998

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

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	alternative cleanup level
ARAR	applicable, relevant, and appropriate requirement
ASTM	American Society for Testing and Materials
BGS	below ground surface
BTEX	benzene, ethylbenzene, toluene, and total xylenes
CAP	Corrective Action Plan
COC	chemical of 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
ISC	Initial Site Characterization
MCL	Maximum Contaminant Level
PAH	polyaromatic hydrocarbon
PVC	polyvinyl chloride
SAIC	Science Applications International Corporation
SI	Site Investigation
TPH	total petroleum hydrocarbon
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

Atlanta, Georgia 30354

Phone (404)362-2687

FAX (404) 362-2654

CORRECTIVE ACTION PLAN
PART B

Facility Name: Building 955 Area, UST 70 Site

Street Address: West 4th Street between McFarland Avenue and Wilson Avenue

City: Fort Stewart County: Liberty

Facility ID: 9-089019

Submitted by UST Owner/Operator:

Name: John H. Spears/Environmental Branch

Company: US Army/HQ 3d Inf. Div (Mech)

Address: 1557 Frank Cochran

City: Ft. Stewart State: GA

Zip Code: 31314-4928

Prepared by:

Name: Patricia Stoll

Company: Science Applications International Corp.

Address: P.O. Box 2502

City: Oak Ridge State: TN

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: John H. Spears

Signature: John H. Spears Date: 8/14/98

B. Professional Engineer or Professional Geologist:

Name: Patricia Stoll

Signature: Patricia R. Stoll

Date: 8/9/98

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 (Figure II-16)
- ☒ Flow Net Superimposed on a Base map (Figure II-17)

III. REMEDIAL ACTION PLAN:

A. Corrective Action Completed or In-Progress:

☐ Recovery/Removal of Free Product (Non-aqueous Phase Hydrocarbons)

☐ Remediation/Treatment of Contaminated Backfill Material & Native Soils

☒ Other (specify) Not Applicable

B. Objectives of Corrective Action:

☐ Remove Free Product That Exceeds One-Eighth Inch

☐ Remediate Groundwater Contamination That Exceeds:

- ☐ Maximum Contaminant Levels (MCLs):

OR

B. Objectives of Corrective Action (continued):

☐ In-stream Water Quality Standards

☐ 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

☒ Not Applicable

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 represents the Site Investigation (SI) Report for the former underground storage tank (UST) 70, Facility ID No. 9-089019, located near Building 955 at Fort Stewart, Georgia. The UST 70 site is located at the Recycle Center on West 4th Street between McFarland Avenue and Wilson Avenue, as illustrated in Figure II-1. The UST 70 site is located within an average or higher groundwater pollution susceptibility area and is greater than 500 feet from a withdrawal point. According to operational information maintained by the Fort Stewart Directorate of Public Works (DPW), UST 70 had a capacity of 1000 gallons and was used for the storage of waste oil. The tank was constructed of asphalt coated/bare steel and the associated piping was galvanized steel. The tank and piping were installed on or about January 1, 1969, and the system was last used in April 1995. The tank and piping were excavated and removed on June 22, 1995. 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.

An Initial Site Characterization (ISC) was performed in June 1995 by Anderson Columbia Environmental, Inc. (Anderson Columbia). Following the ISC, the corrective action plan (CAP) Part A SI was conducted and consisted of the installation of five soil borings for soil and groundwater sampling, and the Part B SI consisted of the installation of four groundwater monitoring wells for soil and groundwater sampling. The Part A SI was performed by Science Applications International Corporation (SAIC) in September and December 1996. The CAP - Part A Report (SAIC 1997) was submitted to the Georgia Environmental Protection Division (GA EPD), GUST in May 1997 describing the results of the ISC and the Part A SI. 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 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 70 was performed for Fort Stewart, DPW, Environmental Branch, through the U.S. Army Corps of Engineers (USACE), Savannah District, by SAIC, in November through December 1997, 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 the tank removal and collection of six soil samples from the tank pit bottom and side walls, which were analyzed for BTEX and TPH. The Part A SI consisted of the following investigative activities: drilling five soil borings plus Hydropunch; collecting soil samples for BTEX, polyaromatic hydrocarbons (PAH), TPH, and volatile organic compound (VOC) headspace analysis; collecting groundwater samples for BTEX and PAH analysis; installing piezometers for water level measurement and detection of free product; and conducting a survey of public and non-public drinking water supplies within a 2.0- and 0.5-mile radius 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 four monitoring well borings for soil and groundwater sampling; collecting soil samples from monitoring wells for BTEX, PAH, TPH, VOC headspace, and geotechnical analysis; collecting groundwater samples for BTEX and PAH analysis; performing rising head slug tests, 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 (26-08) was drilled to 30.0 feet BGS and was screened across the water table at 12.0 to 22.0 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 70 site during the ISC, Part A SI, and Part B SI included ethylbenzene, toluene, and total xylenes. These constituents were present in 8 of the 10 soil samples collected during the Part A investigation, however, the concentrations were below applicable soil threshold levels. The constituents were present in the boreholes in and around the tank pit. An elevated detection limit for benzene exceeded applicable UST Corrective Action Thresholds (i.e., Table A, Column 2) in one sample (2602E1). No BTEX or PAH contamination was detected in the 8 soil samples collected during the Part B investigation. The site was excavated in May 1997, between the Part A and Part B investigations, to repair a damaged sewer line.

II.A.1.a Contaminant concentrations

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

During the ISC, six 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. No BTEX compounds were detected above analytical detection limits.

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

During the Part A SI, 10 soil samples were collected for geochemical analysis from 5 soil borings presented in Figure II-2. Analytical results are presented in Table II-1 and sample locations are presented in Figure II-3. These borings ranged from 12.0 to 22.5 feet below ground surface (BGS). In September 1996, two soil borings (26-01 and 26-02) were drilled in the tank pit. Field screening methods were used during drilling to select soil samples for geochemical analysis. In December 1996, three additional borings were drilled to delineate the horizontal extent of contamination found in the tank pit.

Eight of the 10 soil samples collected had detectable levels of BTEX and PAH constituents. An elevated detection limit of 0.054 mg/kg for benzene was observed in sample 2602E1. Ethylbenzene concentrations ranged from 0.016 to 0.068 (J) mg/kg, toluene concentrations ranged from 0.0083 (J) to 0.18 mg/kg, and total

xylene concentrations ranged from 0.021 (J) to 0.12 mg/kg. Naphthalene and phenanthrene were detected in one sample, 2602E1, at 0.513 mg/kg and 2.37 (J) mg/kg, respectively. Analytical results for soil sampling are presented in the plan view in Figure II-4 and the results exceeding applicable GUST Corrective Action Threshold Levels are presented in the cross-sections in Figure II-4. The benzene detection limit in one sample, 2602E1, exceeds applicable GUST Corrective Action Threshold Levels (i.e., Table A, Column 2). However, the concentrations detected for all contaminants are well below risk-based screening levels (Section III of this document) for these compounds. 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 0.0051 to 0.0064 mg/kg for BTEX constituents (except for benzene in sample 2602E1), and 0.342 to 0.416 mg/kg for PAH constituents.

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

During the Part B SI, eight soil samples were collected for geochemical analysis from four borings presented in Figure II-2. Analytical results are presented in Table II-2 and sample locations are presented in Figure II-3. These samples were collected in accordance with the technical approach presented in the Site Investigation Plan of the CAP - Part A Report, which was approved by GA EPD in correspondence dated July 30, 1997 (White 1997). The Part B SI soil borings ranged from 20.0 to 30.0 feet BGS. All four soil borings were converted to monitoring wells: one downgradient based on the 1996 flow direction (26-09); two side gradient to the tank pit along underground utility lines (26-06, 26-07); and one in the vicinity of the highest Part A SI soil contamination (26-08) to delineate the vertical extent of contamination. Other than 26-08, soil samples were not collected for geochemical analysis from below the water table. Field screening methods were used during drilling to select soil samples for geochemical analysis from borings 26-06 through 26-09. Sample intervals in boring 26-08 were targeted below the water table in order to delineate the vertical extent of contamination.

None of the eight soil samples collected during the Part B SI had detectable levels of BTEX or PAH constituents. The detection limits for soil samples during the Part B SI ranged from 0.0021 to 0.0027mg/kg for BTEX constituents, and 0.37 to 13.7 mg/kg for PAH constituents. TPH concentrations ranged from 14.6 mg/kg to 666 mg/kg. Analytical results are shown in plan view and in cross-section in Figure II-4. All of the detection levels were below the applicable GUST Corrective Action Threshold Levels (i.e., Table A, Column 2), and the risk-based screening levels for these compounds (Section III of this document).

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 in glass jars and covered with aluminum foil. This sample corresponded to potential analytical sample aliquots collected from the same interval. After allowing at least 15 minutes for volatilization and temperature equilibration, headspace VOC concentration was measured with a MiniRAE 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 where no contamination was detected by field headspace gas analysis in any of the borehole intervals, 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 where contamination was detected by field headspace gas analysis in one or more of the borehole intervals, 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 70 site during the ISC, Part A SI, and Part B SI included BTEX, naphthalene, and phenanthrene. These constituents were present in four of the five groundwater samples collected during the Part A investigation. Two samples and one detection limit exceeded federal maximum contaminant levels (MCLs) for benzene. Other constituents detected were all below applicable regulatory threshold values. No BTEX or PAH contamination was detected in the four groundwater samples collected during the Part B investigation. The site was excavated in May 1997, between the Part A and Part B investigations, to repair a damaged sewer line. During the excavation, approximately 3000 gallons of liquid was pumped from the excavation and disposed of at the industrial wastewater treatement plant.

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 and ancillary piping.

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

During the Part A SI, five groundwater samples were collected for geochemical analysis from five hydropunch groundwater sampling points as presented in Table II-4. The hydropunch groundwater sampling points (26-01 through 26-05) penetrated approximately 3 feet below the water table: 26-01 and 26-02 were located in the tank pit, 26-03 was located to the southwest of the tank pit, 26-04 was located north of the tank pit, and 26-05 was located to the west of the tank pit.

Benzene was identified above analytical reporting limits in two groundwater samples during the Part A SI. Samples 2602W2 and 2604W2 contained 14.8 µg/L (J) and 200 µg/L of benzene, respectively, as illustrated in plan view and cross-section on Figure II-5. These concentrations are above the federal MCL of 5 µg/L. Sample 2601W2 contained an elevated detection limit of 53.8 µg/L for benzene, which exceeded the MCL. The two detected concentrations and the elevated detection limit exceed the risk-based screening level of 0.36 µg/L. The analytical detection limit for benzene was 5 µg/L in all samples, except for 2601W2. An alternate concentration limit (ACL) was not calculated for benzene because the Part A data is no longer indicative of site conditions because of the excavation activities that took place between the Part A and Part B investigations to replace a damaged sewer line.

Ethylbenzene was identified above analytical reporting limit in three groundwater samples during the Part A SI. Samples 2601W2, 2062W2, and 2604W2 contained 241 µg/L (J), 64.3 µg/L, and 37.9 µg/L of ethylbenzene, respectively, as illustrated in plan view and cross-section on Figure II-6. These concentrations are below the federal MCL of 700 µg/L and below the risk-based screening level of 1300 µg/L.

Toluene was identified above analytical reporting limits in the three groundwater samples during the Part A SI. One sample contained estimated values below the reporting limit. Samples 2601W2, 2602W2, 2603W2, and 2604W2 contained 683 µg/L, 153 µg/L, 0.42 µg/L (J), and 229 µg/L, respectively, of toleune as illustrated in plan view and cross-section on Figure II-7. The concentrations are below the federal MCL of 1000 µg/L and below the risk-based screening level of 750 µg/L.

Total xylenes were identified above analytical reporting limits in three groundwater samples during the Part A SI. Samples 2601W2, 2602W2, and 2604W2 contained 1400 µg/L, 367 µg/L, and 129 µg/L of total xylenes, respectively, as illustrated in plan view and cross-section on Figure II-8. These concentrations are below the federal MCL of 10,000 µg/L and below the risk-based screening level of 12,000 µg/L.

Naphthalene was identified above analytical detection limits in three groundwater samples during the Part A SI. Samples 2601W2, 2602W2, and 2604W2 contained 412 µg/L, 325 µg/L, and 30.6 µg/L of naphthalene, respectively, as illustrated in plan view and cross-section on Figure II-9. This compound does not have a federal or state MCL, however, the concentrations are below the risk-based screening level of 1500 µg/L. The analytical detection limits for naphthalene were 10 to 40 µg/L.

Phenanthrene was identified above analytical detection limits in one groundwater sample during the Part A SI. Sample 2602W2 contained 338 µg/L of phenanthrene as illustrated in plan view and cross-section on Figure II-10. Sample 2601W2 contained an elevated detection limit for phenanthrene. This compound does not have a federal or state MCL, however, the concentration and elevated detection limit are below the risk-based screening level of 1500 µg/L. The analytical detection limits for phenanthrene were 10 to 40 µg/L, except for the elevated detection limit in 2601W2.

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

During the Part B SI, four groundwater samples were collected for geochemical analysis from four groundwater monitoring wells as presented in Table II-5. The groundwater monitoring wells (26-06, 26-07, 26-08, and 26-09) were drilled between 3.5 and 14.0 feet below the water table. Monitoring wells 26-06 and 26-07 are located northeast and southwest of the tank pit near underground utilities that run through the site, monitoring well 26-09 was located downgradient based on 1996 groundwater flow direction, and monitoring well 26-08 was located in the area of highest contamination. Monitoring well locations are presented in Figure II-2.

Benzene was not identified above analytical detection limits in groundwater samples during the Part B SI as illustrated in plan view and cross-section on Figure II-11. The detection limits were below the federal MCL of 5 µg/L and below the risk-based screening level of 0.36 µg/L. The analytical detection limit for benzene was 2 µg/L.

Ethylbenzene was not identified above analytical detection limits in groundwater samples during the Part B SI as illustrated in plan view and cross-section on Figure II-12. The detection limits were below the federal MCL of 700 µg/ and below the risk-based screening level of 1300 µg/L. The analytical detection limit for ethylbenzene was 2 µg/L.

Toluene was not identified above analytical detection limits in any groundwater samples during the Part B SI as illustrated in plan view and cross-section on Figure II-13. The detection limits were below the federal MCL of 1000 µg/L and below the risk-based screening level of 750 µg/L. The analytical detection limit for toluene was 2 µg/L.

Total xylenes were not identified above analytical detection limits in groundwater samples during the Part B SI as illustrated in plan view and cross-section on Figure II-14. The detection limits were below the federal MCL of 10,000 µg/L and below the risk-based screening level of 12,000 µg/L. The analytical detection limit for total xylenes was 4 µg/L.

Naphthalene was not identified above analytical detection limits in groundwater samples during the Part B SI as illustrated in plan view and cross-section on Figure II-15. This compound does not have a federal or state MCL, but the detection limit was below the risk-based screening level of 1500 µg/L. The analytical detection limit for naphthalene was 9.8 µg/L.

Phenanthrene was not identified above analytical detection limits in groundwater samples during the Part B SI as illustrated in plan view and cross-section on Figure II-16. This compound does not have a federal or state MCL, but the detection limit was below the risk-based screening level of 1500 µg/L. The analytical detection limit for phenanthrene was 9.8 µg/L.

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

Figures II-5 through II-16 demonstrate that the horizontal extent of petroleum contaminants in groundwater has been delineated to the respective analytical detection limits. The horizontal extent of these constituents has been estimated based on nearby concentrations and the distribution of similar contaminants.

Petroleum contaminants identified in groundwater at the UST 70 site during the Part A SI include BTEX constituents normally associated with waste oil releases as well as PAH constituents, which likely represent less soluble biodegradation products of the release. In May 1997, approximately 3000 gallons of liquid was removed from an excavation to repair a damaged sewer line beneath the site. During the Part B SI, no BTEX or PAH compounds were detected in the groundwater at the site. The UST 70 site is a likely candidate for natural attenuation since the source of the contamination has been removed and there is no longer a plume because of excavation activities to repair a damaged sewer line. Site groundwater flow and the geology are conducive to aerobic biodegradation, which is known to produce the most rapid biodegradation rates for hydrocarbons.

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 per GUST technical direction. Soil boring 26-08 was advanced below the water table and soil samples were collected from 22.5 to 25.0 feet and 27.5 to 30.0 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 26-08, but is believed to be located within 10 to 20 feet of the bottom of this boring. Since both sample intervals did not indicate the presence of BTEX or PAH constituents above analytical detection levels, the vertical extent of groundwater contamination has been determined and is limited to the surficial aquifer (i.e., <30 ft BGS).

II.A.3 Delineation of Free Product Plume

No free product was identified at the UST 70 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 70 site. The nearest surface water body, which is a potential groundwater discharge receptor, is a drainage ditch located approximately 1000 feet southwest of the site (Figure II-17). 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 70 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), Facility ID #9-089019 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. Six of these wells are 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 into the groundwater at the well heads prior to being pumped into storage tanks and/or water towers, according to Fort Stewart DPW personnel. The location of these wells, along with a 500-foot radius drawn around each well, is shown in Figure II-17. Based on the location of

Facility ID #9-089019 relative to the identified groundwater supply wells, this site is classified as being located greater than 500 feet to 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 used primarily 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 and 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 encounted during drilling at this site, but is believed to be located at 40 to 50 feet BGS, thus 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: Cooswhatchie Formation, Markshead Formation, and the Parachula Formation, which are 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 disconformabily overlies the Markshead Formation and is distinguished from the underlying unit by dark phosphatic clays or phosphorite in the lower part and fine-grainded sand in the upper part.

The Marshead Formation is approximately 70 feet thick in the Savannah Georgia area and consists of light colored phosphatic, slightly dolomitic, argillacerous sand to fine-grainded sandy clay with scattered beds of dolostone, limestone, and siliceous, and dolomitic and less calcareous.

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 7.10 to 7.94) groundwater conditions found in shallow groundwater in the southeast. Conductivity values at the site were low, ranging from 0.081 to 0.104 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 are shown in Figure II-17 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 miles 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 east 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 northwest end of the garrison area. The two unnamed ponds are located at the northwest 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 less than 500 feet in diameter. Based on the surface water features discussed, the UST 70 site, Facility ID #9-089019, is classified as being located greater than 500 feet to a surface water body.

Run-off from the UST 70 site moves over the grass and dirt cover to the Fort Stewart storm water drainage system. Since petroleum contamination at the site primarily impacts groundwater, the surface water run-off pathway is not a viable contaminant transport mechanism because of the location of the nearest surface water body. The nearest surface water body that is a potential groundwater discharge receptor is a drainage ditch located approximately 1000 feet southwest of the site.

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 investigations 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 zero feet at the fall line located approximately 350 miles inland from the Atlantic coast, to approximately 4200 feet at the coast. State geologic records describe a probable petroleum exploration well (the No. 1 Jelks-Rogers) located in the region as encountering crystalline basement rocks at a depth of 4254 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 1970 feet thick and dominated by clastics. The Tertiary section was found to be approximately 2170 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 be 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 dominantly 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 30 feet of the surface at the UST 70 site appear to correlate with the regional stratigraphic section. Part B SI soil boring logs and monitoring well diagrams are located in Appendices B and C, respectively. 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 have been developed based on the Part A SI and Part B SI soil boring logs. Figure II-3 presents a southwest/northeast cross-section (A-A') and a southeast/northwest 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 26-06, 26-07, 26-08, and 26-09 in order to determine selected engineering properties of the saturated zone underlying the UST 70 site. The engineering properties measured included Unified Soil Classification System (USCS) classification, grain size, moisture content,

and Atterberg limits, 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), and ASTM D 4318 (Atterberg Limits). In addition, permeability (ASTM D 5084), porosity (EM-1110-2-1906), and specific gravity (ASTM D 854) analyses were performed on the sample from boring 26-06.

II.B.4.b Slug testing

A rising head slug test was conducted in monitoring well 26-08 to obtain a value for the hydraulic conductivity of the water bearing zone (Appendix D.2). A Troll data logger was used to obtain accurate results during the slug tests, and the results were analyzed using the Bouwer and Rice Method (WRR 1976).

Due to the high conductivity of the formation, the water level recovered to static within approximately one 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 3.5×10^{-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.

The 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-inches. Table II-7 summarizes construction details for Part A SI hydropunch sampling points and Part B SI monitoring wells. Well construction diagrams are presented in Appendix C. Following installation of the well casing, No. 2 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 2.0 feet above the top of the well screen.

Well seals were composed of 3/8-inch bentonite pellets and allowed to hydrate before filling the annular space above the seal. 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 2.0 feet 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 × 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 during the Part A SI 24 hours after piezometer installation in September and December 1996 and during Part B SI groundwater sampling activities in November and December 1997. Data obtained from these measurements are presented in Table II-8. Part B SI data were used to construct a groundwater potentiometric surface map (Figure II-18). From the potentiometric data, groundwater flow under the UST 70 site appears to flow to the southeast with an average gradient of 0.0094 feet/feet. During the Part A SI in September 1996, groundwater was flowing to the northwest with a gradient of 0.11 feet/feet. Placement of well 26-09 was located downgradient based on the 1996 groundwater flow direction.

II.B.5.c Equipotential flow net

An equipotential flow net based on the sitewide water level measurements and the contoured potentiometric surface is presented in Figure II-19.

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 at the UST 70 site has been identified, therefore, no recovery/removal of free product has been performed.

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

The former UST 70 was a 1000-gallon waste oil tank. UST 70 was removed in June 1995 and was in service for approximately 27 years. The UST, along with soil and piping, was excavated and removed from the site. Notification letters, a Report of Soil Sampling and UST Removal, and a Closure Activity Form were submitted to GA EPD in association with the UST removal activity (Anderson Columbia 1995). Elevated concentrations of TPH was detected in tank pit soils during UST removal and excavation activities. In May 1997, the soil was excavated to replace a damaged sewer line beneath the site. While the excavation was open, approximately 3000 gallons of liquid/groundwater was pumped from the base of the excavation and disposed of at the industrial wastewater treatment plant. After the sewer line was repaired, the soil was returned to the excavation and clean fill was added.

III.B OBJECTIVE OF CORRECTIVE ACTION

III.B.1 Removal of 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 70 site, therefore, no recovery/removal of free product was performed.

III.B.2 Remediate Groundwater Contamination

The Part A SI documented groundwater contamination that exceeded MCLs in three Part A SI borings. Benzene exceeded its MCL in three Part A borings. Further investigation during the Part B SI provided more groundwater contaminant data. These results indicate that after the excavation activities to repair a damaged sewer line, there are no BTEX or PAH contaminants present in the groundwater. Even though the groundwater conditions changed between the Part A SI and Part B SI, fate and transport modeling was conducted using data from the Part A SI. This modeling using the AT123D model (Appendix E) suggest that benzene (the most conservative representative compound) concentrations observed during the Part A SI will not exceed its MCL at the drainage ditch, located 1000 feet southwest of the site. Since a large volume of liquid/groundwater was pumped from the site during repair of a damaged sewer line and no groundwater contamination was observed during the Part B SI, active remediation of groundwater is not recommended.

III.B.3 Remediate Soil Contamination

The Part A SI documented soil contamination above applicable GUST Threshold Levels (Table A, column 2) in one location. Benzene exceeded threshold levels due to an elevated detection level. Further investigation during the Part B SI provided more soil contaminant data. These results suggest that contaminant concentrations at the perimeter of the site are below threshold levels. The contaminant concentrations are below risk-based screening levels that are protective of soil exposure during industrial land use. Active remediation of soil is not recommended, because benzene was not present in the soil during the tank removal and was assumed to be present during the Part A SI due to an elevated detection limit. Additional backfill soil was placed at the site during repair of a damaged sewer line.

III.B.4 Provide Risk-based Corrective Action

A risk-based approach was used to determine the need for further action at the UST 70 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 as a result of the lack of habitat available for ecological receptors due to the industrial nature of the site, which is located in the Installation's recycling facility.

The methods for assessing human health concerns for the UST 70 site were derived primarily from recent GA EPD guidance (GA EPD 1996) and the *Supplemental Guidance to RAGS: Region IV Bulletin Human Health Risk Assessment* (EPA 1994); these were supplemented by additional guidance documents on risk assessment methods referenced in this section. Risk-based remediation threshold levels were identified in two steps: (1) screening against risk-based and applicable, relevant, and appropriate requirement (ARAR)-based screening levels for chemicals of concern (COCs), and (2) development of site-specific ACLs for the COCs identified during the screening. The following sections present the conceptual model of the exposure setting and potential receptors and the general methodology employed to perform the screening for COCs and the development of ACLs.

III.B.4.a Potential receptor survey

III.B.4.a.1 Exposure Assessment

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 may come into contact with the receptors, and the routes of exposure through which the receptors may be exposed. Figure III-1 presents potentially complete and incomplete pathways for contaminant sources at the UST 70 site.

The site is located within an active military installation. The UST 70 site is located within an access-controlled fence of a secure area used as the Installation's recycling center. The land use at the site is currently military industrial. An Installation housing area is located approximately 3500 feet to the northeast. Mill Creek is located approximately 2000 feet southwest of the site.

No current on-site receptors have been identified for the site because the contamination is located in the subsurface. Potential current off-site receptors include military residents and children. Potential future on-site receptors may include industrial workers and residential receptors.

No connection between site contamination and current off-site receptors has been identified. It is unlikely that Installation residents will come in contact with contaminated groundwater due to the depth at which drinking water is pumped from the Floridan aquifer and the thick confining layer located between this aquifer and the surficial aquifer. No basements have been identified in the area that could potentially be affected by vapor intrusion from chemicals in the groundwater. None of the Installation's water supply wells are located downgradient of the UST 70 site. The water supply wells are separated from the surficial aquifer by the Hawthorn Group, a thick and highly effective confining unit.

Potential future on-site industrial receptors may come in direct contact with site soil contamination during construction or excavation activities. Potential future residential receptors may come in direct contact with groundwater contamination during household water use.

Exposure from *direct contact pathways* represents exposure via direct contact with the source media. For direct contact pathways, the exposure point concentration is the concentration source term (EPA 1994) and is represented by data collected at the site. Screening for the direct contact pathways utilize the results of the data collected at UST 70 site to perform the screens.

Exposure pathways that incorporate chemical migration to a secondary media (groundwater, surface water, sediments, air, and biota) or to an off-site receptor are referred to as *indirect contact pathways*. The exposure point concentrations for the secondary media will be determined using mathematical models that take into consideration chemical-specific and media-specific properties to estimate the chemical concentration in the secondary exposure media.

III.B.4.a.2 Screening for COCs

The purpose of a risk evaluation screen is to identify the COCs and areas of concern at a site, and possibly identify sites for which no further action is needed. The first step in the risk process uses screening levels that are readily obtainable and, 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 ASTM (ASTM 1995) Tier 1-type risk evaluation process will be applied to the data collected for the UST 70 site to identify any COCs and media for which no further action is needed. The risk evaluation screen involves the following steps:

- 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 and ARAR-based screening levels for each contaminant.

- Compare site-related concentrations to screening levels to determine if any chemicals of potential concern exist at the site.

- Compare detection limits to screening levels to identify potential false negative screening results.

The screening levels for the UST 70 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 (Table A, Column 2);
- Soil screening levels developed by U.S. Environmental Protection Agency (EPA 1996); and
- Soil and groundwater risk-based concentrations developed by EPA Region 3 (EPA 1996).

These values reflect screening levels based on a combination of ARARs (i.e., MCLs and GUST Soil Threshold Levels), and calculated risk-based values (i.e., EPA Region 3 risk-based concentrations). Soil and groundwater screening levels reflect a combination of both ARAR-based and risk-based values.

Screening levels inherently incorporate assumptions about land use. In identifying COCs, it is generally accepted that screening levels will reflect any potential future land uses and, thus, usually reflect a conservative residential use scenario (EPA 1991; EPA 1996; 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.

The EPA Soil Screening Guidance (EPA 1996) 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 70 site.

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

III.B.4.a.3 Results

The risk screening process is a systematic screening of sample results to determine site-related COCs. Chemical concentrations below risk- or ARAR-based screening levels are not considered COCs 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.

The UST 70 site soils were excavated and clean fill was added while replacing a damaged sewer line beneath the site between the Part A and Part B investigations. Also during the construction, a large volume of water was pumped from the bottom of the excavation and sent to the industrial wastewater treatment plant. The data collected during the Part A investigation are no longer considered to be representative of current site conditions. The data results for the Part A investigation were screened against risk-based and ARAR based screening levels, but no current COCs were selected based on these screens. Current COCs for the UST 70 site were developed based on the screens performed on the Part B investigation data results, only.

Ethylbenzene, lead, naphthalene, phenanthrene, toluene, xylenes, and TPH were detected in soil samples at concentrations below screening levels during the Part A SI sampling. Lead and TPH were detected below screening levels during the Part B SI sampling. No COCs were identified for UST 70 area soils.

A detection limit for benzene, during the Part A SI, and several PAHs, during the Part B SI, were above GUST action levels and risk-based screening levels. No COCs for soils were selected for the site based on the detection limit screen.

One detection for benzene (200 µg/L) and one estimated detection (14.8 µg/L) in two Part A boreholes (26-04 and 26-02, respectively) exceeded the risk-based screening level for benzene of 0.36 µg/L and the federal MCL for benzene of 5 µg/L. Lead was detected above the technology action level of 15 µg/L in all three wells sampled for lead during the Part A investigation with concentrations ranging from 52.7 to 2020 µg/L. Ethylbenzene, naphthalene, phenanthrene, toluene, and xylenes were detected below screening values for the Part A. No COCs were selected based on the Part A groundwater screen for UST 70.

Iron was detected during the Part B investigation, but no screening levels exist to evaluate the chemical. No COCs were selected based on the Part B groundwater screen for UST 70.

Detection limits for benzene and 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 µg/L by one to three orders of magnitude. No COCs for groundwater were selected based on the detection limit screening.

III.B.4.a.4 Uncertainties

Groundwater samples collected during the Part A SI were collected from hydropunch sampling devices or temporary piezometers and contained a high amount of suspended solids and were very turbid. The lead concentrations in these samples above the the technology action level are attributed to the suspended particles and not the contaminated groundwater.

III.B.4.a.5 ACLs

No COCs were identified for soil or groundwater for the UST 70 site, thus no ACLs are developed for the site.

III.B.4.b Fate and transport model

The AT123D model was used to determine the impact of dissolved hydrocarbons on potential receptors. 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 groundwater contamination observed in the Part A SI. Mill Creek and a drainage ditch were evaluated as potential receptors. 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 thick, thus it would take over 1450 years for the contamination to migrate through the confining layer. The surficial aquifer where the contaminant plume is located is not used as a source of drinking water.

In the Part A SI, the highest benzene concentration was 200 µg/L. No contamination was observed in the monitoring wells installed during the Part B SI. The groundwater conditions changed due to the removal of liquid/groundwater during excavation activites between the two investigations. Modeling was performed for the Part A scenario to evaluate the benzene concentration associated with the Part A investigation. The modeling results for benzene are provided in Appendix E.

Two potential downgradient locations where a receptor may encounter migrating groundwater contamination were modeled. A drainage ditch approximately 1000 feet southwest of the site and Mill Creek approximately 2000 feet southwest of the site are the nearest possible locations where a receptor may encounter migrating groundwater contamination due to a possible hydraulic connection between the groundwater and the surface water in the ditch and the creek. Modeling of contamination from groundwater to surface water, for 100 years, in the ditch and in the creek, when accounting for biodegradation, indicates that benzene (i.e., at the Part A SI concentration) will not reach the ditch or the creek in detectable levels. Even when biodegradation and natural attenuation are ignored, surface water will not be impacted at concentrations above MCLs by the current site conditions at the UST 70 site, Facility ID #9-089019.

III.B.4.c Conclusions and recommendations

The following conclusions 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 no contaminants exceed initial risk-based screening levels for groundwater during the Part B SI.
- The horizontal and vertical extent of soil and groundwater contamination were determined during the Part A and B SIs.
- No groundwater contamination existed at the site during the Part B SI.
- Fate and transport modeling of benzene indicates that contamination from the Part A site conditions at Facility ID #9-089019 will never exceed MCLs at a conservatively defined downgradient receptors, a drainage ditch and Mill Creek.

Considering the site characteristics, the remaining contamination is minimal and natural attenuation will provide the best corrective action for this site. There is no longer a groundwater plume at the site, so a monitoring program is not recommended. The four existing monitoring wells should be properly abandoned as soon as possible. Detailed closure 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 and closure, 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 70 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 similar to the UST 70 site (e.g., shallow water table, permeable silty sand). In fact, the conditions at the UST 70 site are similar to other sites that are ideal for biodegradation (Abou-Rizk et al. 1995). Site groundwater flow and the geology are all conducive to aerobic biodegradation, which is known to produce the most rapid biodegradation rates for hydrocarbons.

Finally, the source has been removed, therefore, subsurface conditions (dissolved oxygen, oxidation-reduction potential, background nutrient availability) will steadily improve with time. In addition, approximately 3000 gallons of liquid/groundwater were removed from the site during activities to repair a damaged sewer line and no contamination was observed during the Part B SI. Since there is no longer a groundwater plume, the four existing monitoring wells should be abandoned and the site closed.

III.D IMPLEMENTATION

III.D.1 Periodic Monitoring/Milestone Schedule

Periodic monitoring of the groundwater is not required since the plume no longer exists.

III.D.2 Progress Reporting

Progress reporting will not be required since periodic monitoring will not be conducted.

III.D.3 Certificate of Completion Report

Petition for permanent closure will be submitted upon approval of this CAP-Part B report. GA EPD will provide final approval for decommissioning of the monitoring wells, which is being requested as part of this report. Decommissioning of monitoring wells will be completed according to the USACE design manual for monitoring wells. Decommissioning will comply with all applicable state and federal standards.

The following certification will be submitted to EPD within 30 days of receiving approval of this CAP-Part B report:

I hereby certify that the Corrective Action Plan-Part B, dated _____, 19___, for Fort Stewart Army Installation, UST 70 site, Facility ID#: 9-089019, 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

The existing monitoring wells will be abandoned in accordance with USACE standards for decommissioning monitoring wells and applicable state and federal standards.

III.D.5 Periodic Monitoring

Periodic monitoring will not be performed.

III.D.6 Effectiveness of Corrective Action

No corrective action is being taken, except for abandonment of the existing monitoring wells.

III.D.7 Confirmatory Soil Sampling Plan

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

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

A monitoring system is not recommended for this site, therefore, there are no termination conditions.

III.D.10 Post-Completion Site Restoration Activities

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

III.E PUBLIC NOTIFICATION

The UST 70 site is located entirely within the confines of Fort Stewart, a federal facility. All of the property contiguous to the site is owned by the U.S. Government. Public notification during the CAP-Part A was accomplished through publication of the notification letter in the *Savannah Morning News*. This same approach will be used for the CAP-Part B public notification.

Publication of this announcement was completed prior to submitting this CAP-Part B report for review by the GA EPD. A copy of the newspaper announcement to be used for public notification and an affidavit and publication are presented in Appendix G of this report.

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IV. CLAIM FOR REIMBURSEMENT

The UST 70 site at Fort Stewart is part of a federal reservation, and, as such, is not eligible for reimbursement through the GUST Trust Fund.

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TABLES

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Table II-1. Analytical Results of Part A Soil Samples Collected at the UST 70 Site, Facility ID #9-089019

Station:	Georgia	26-01	26-01	26-02	26-02	26-03	26-03	26-04	26-04	26-05	26-05
Sample ID:	UST	2601H1	2601J1	2602E1	2602F1	2603A1	2603C1	2604A1	2604D1	2605A1	2605C1
Sample Interval:	Corrective	17.5' - 20.0'	20.0' - 21.6'	10.0' - 12.5'	12.5' - 15.0'	0.0' - 2.5'	5.0' - 7.5'	0.0' - 2.5'	7.5' - 10.0'	0.0' - 2.5'	5.0' - 7.5'
Media:	Action	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Type:	Levels	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Collection Date:	for Soil[a]	17-Sep-96	17-Sep-96	18-Sep-96	18-Sep-96	11-Dec-96	11-Dec-96	11-Dec-96	11-Dec-96	11-Dec-96	11-Dec-96
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2-Chloronaphthalene	N/A[b]	0.406 U	0.416 U	0.351 U	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Acenaphthene	N/A[b]	0.406 UJ	0.416 U	0.351 U	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Acenaphthylene	ND	0.406 U	0.416 U	0.351 U	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Anthracene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 UJ	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Benzene	0.008	0.0061 U	0.0063 U	**0.054 U**	0.0064 UJ	0.0052 U	0.0057 U	0.0051 U	0.0054 U	0.0055 U	0.0053 U
Benzo(a)anthracene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 UJ	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Benzo(a)pyrene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Benzo(b)fluoranthene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Benzo(g,h,i)perylene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Benzo(k)fluoranthene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Chrysene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 UJ	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Dibenzo(a,h)anthracene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Ethylbenzene	10	0.0061 U	0.016 =	0.068 J	0.051 J	0.0052 U	0.0057 U	0.0051 U	0.0054 U	0.0055 U	0.0053 U
Fluoranthene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 UJ	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Fluorene	N/A[b]	0.406 U	0.416 U	0.351 U	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Indeno(1,2,3-cd)pyrene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Lead	--		1.7 U		5 U		7.5 =	11.7 =		7.3 =	
Naphthalene	N/A[b]	0.406 U	0.416 U	0.513 =	0.414 U	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Phenanthrene	N/A[b]	0.406 U	0.416 U	2.37 J	1.27 J	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Pyrene	N/A[b]	0.406 U	0.416 U	0.351 UJ	0.414 UJ	0.342 U	0.372 U	0.337 U	0.352 U	0.363 U	0.352 U
Toluene	6	0.013 J	0.04 =	0.054 U	0.018 J	0.0141 =	0.0057 U	0.0157 =	0.0054 U	0.0083 J	0.18 =
Total Petroleum Hydrocarbons	--	5.36 U	128 =	24000 =	13400 =	189 =	53.5 =	150 =	22.8 =	109 =	10.6 U
Xylenes, Total	700	0.021 J	0.12 =	0.12 J	0.46 J	0.0052 U	0.0057 U	0.0051 U	0.0054 U	0.0055 U	0.0053 U

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Not Applicable
10 Bold values indicate results exceeding Georgia UST action levels.
U Indicates that the compound was not detected above the reported sample quantitation limit
J Indicates that the value for the compound was an estimated value
UJ Indicates that the sample was not detected above an approximate sample quantitation limit
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified
= Indicates that the compound was detected at the concentration reported

Table II-2. Analytical Results of Part B Soil Samples Collected at the UST 70 Site, Facility ID #9-089019

Station:	Georgia	26-06	26-06	26-07	26-07	26-08	26-08	26-09	26-09
Sample ID:	UST	260611	260621	260711	260721	260811	260821	260911	260921
Sample Interval:	Corrective	7.0' - 10.0'	15.0' - 17.5'	7.5' - 10.0'	15.0' - 17.5'	22.5' - 25.0'	27.5' - 30.0'	0.0' - 2.5'	12.5' - 15.0'
Media:	Action	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Type:	Levels	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Collection Date:	for Soil[a]	06-Nov-97	06-Nov-97	5-Nov-97	5-Nov-97	5-Nov-97	5-Nov-97	5-Nov-97	5-Nov-97
Units:	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
2-Chloronaphthalene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Acenaphthene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Acenaphthylene	ND	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Anthracene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Benzene	0.008	0.0023 U	0.0024 U	0.0022 U	0.0025 U	0.0027 U	0.0026 U	0.0023 U	0.0021 U
Benzo(a)anthracene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Benzo(a)pyrene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Benzo(b)fluoranthene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Benzo(g,h,i)perylene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Benzo(k)fluoranthene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Chrysene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Dibenzo(a,h)anthracene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Ethylbenzene	10	0.0023 U	0.0024 U	0.0022 U	0.0025 U	0.0027 U	0.0026 U	0.0023 U	0.0021 U
Fluoranthene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Fluorene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Indeno(1,2,3-cd)pyrene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Lead	--		3 =		6.4 =		2.6 =		16.9 =
Naphthalene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Phenanthrene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Pyrene	N/A[b]	0.388 U	0.392 U	0.37 U	0.417 U	0.45 U	0.426 U	0.375 U	13.7 U
Toluene	6	0.0023 U	0.0024 U	0.0022 U	0.0025 U	0.0027 U	0.0026 U	0.0023 U	0.0021 U
Total Organic Carbon	--		10600 =		15200 =		6810 =		3420 =
Total Petroleum Hydrocarbons	--	217 =	2.66 U	14.6 =	4.01 U	6.16 U	6.76 U		666 =
Xylenes, Total	700	0.0046 U	0.0047 U	0.0045 U	0.005 U	0.0054 U	0.0053 U	0.0045 U	0.0041 U

[a] Average or higher groundwater pollution susceptibility area (where public water supply is within 2.0 mi.).
[b] Not applicable.
10 Bold values indicate results exceeding Georgia UST action levels.
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J Indicates that the value for the compound was an estimated value
UJ Indicates that the sample was not detected above an approximate sample quantitation limit
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Table II-3. Soil Field Screening Data Collected at the UST 70 Site, Facility ID #9-089019

INTERVAL (ft BGS)	26-01 headspace (ppm)	26-02 headspace (ppm)	26-03 headspace (ppm)	26-04 headspace (ppm)	26-05 headspace (ppm)	26-06 headspace (ppm)	26-07 headspace (ppm)	26-08 headspace (ppm)	26-09 headspace (ppm)
0.0 - 2.5	0.0	0.0	0.3	1.4	1.1	NC	0.1	NC	102
2.5 - 5.0	0.0	0.0	NC	0.0	NC	0.0	0.1	NC	NC
5.0 - 7.5	0.0	0.0	0.5	0.0	0.6	NC	0.1	NC	19.8
7.5 - 10.0	0.0	0.0	NC	0.0	0.9	0.0	0.1	NC	26.5
10.0 - 12.5	0.0	94.0	NA	NA	NA	NC	0.1	0.6	7.2
12.5 - 15.0	0.0	121.0	NA	NA	NA	1.0	0.1	NC	3.2
15.0 - 17.5	5.6	NA	NA	NA	NA	0.0	0.1	NC	NC
17.5 - 20.0	15.0	NA	NA	NA	NA	0.0	0.4	0.4	NC
20.0 - 22.5	17.0	NA	NA	NA	NA	NA	NC	NC	NA
22.5 - 25.0	NA	NA	NA	NA	NA	NA	NC	1.0	NA
25.0 - 27.5	NA	NA	NA	NA	NA	NA	NA	0.3	NA
27.5 - 30.0	NA	NA	NA	NA	NA	NA	NA	0.1	NA

* headspace measured using an MiniRAE photoionization detector
NA not applicable, interval below total depth of boring
NC not collected, no sample recovery or headspace measurements were not recorded

Table II-4. Analytical Results of Part A Groundwater Samples Collected at the UST 70 Site, Facility ID #9-089019

Station:		26-01	26-02	26-03	26-04	26-05
Sample ID:		2601W2	2602W2	2603W2	2604W2	2605W2
Media:		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sample Type:	Federal	Grab	Grab	Grab	Grab	Grab
Collection Date:	SDWA MCLs	17-Sep-96	18-Sep-96	11-Dec-96	13-Dec-96	16-Dec-96
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
2-Chloronaphthalene		400 U	200 U	40 U	10 U	40 U
Acenaphthene		400 U	200 U	40 U	10 U	40 U
Acenaphthylene		400 U	200 U	40 U	10 U	40 U
Anthracene		400 U	200 U	40 U	10 U	40 U
Benzene	5	**53.8 U**	**14.8 J**	5 U	**200 =**	5 U
Benzo(a)anthracene		400 U	200 U	40 U	10 U	40 U
Benzo(a)pyrene	0.2	**400 U**	**200 U**	**40 U**	**10 U**	**40 U**
Benzo(b)fluoranthene		400 U	200 U	40 U	10 U	40 U
Benzo(g,h,i)perylene		400 U	200 U	40 U	10 U	40 U
Benzo(k)fluoranthene		400 U	200 U	40 U	10 U	40 U
Chrysene		400 U	200 U	40 U	10 U	40 U
Dibenzo(a,h)anthracene		400 U	200 U	40 U	10 U	40 U
Ethylbenzene	700	246 J	64.3 =	5 U	37.9 =	5 U
Fluoranthene		400 U	200 U	40 U	10 U	40 U
Fluorene		400 U	159 J	40 U	10 U	40 U
Indeno(1,2,3-cd)pyrene		400 U	200 U	40 U	10 U	40 U
Lead	15[a]			**52.7 =**	**91.6 =**	**2020 =**
Naphthalene		412 =	325 =	40 U	30.6 =	40 U
Phenanthrene		400 U	338 =	40 U	10 U	40 U
Pyrene		400 U	200 U	40 U	10 U	40 U
Toluene	1000	683 =	153 =	0.42 J	229 =	5 U
Xylenes, Total	10000	1400 =	367 =	5 U	129 =	5 U

[a] Technology Action Level (Federal Register Vol. 56. No. 110, June 7, 1991)

10 Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels

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

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

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

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

= Indicates that the compound was detected at the concentration reported

Table II-5. Analytical Results of Part B Groundwater Samples Collected at the UST 70 Site, Facility ID #9-089019

Station:		26-06	26-07	26-08	26-09
Sample ID:		2606W2	2607W2	2608W2	2609W2
Media:		Groundwater	Groundwater	Groundwater	Groundwater
Sample Type:		Grab	Grab	Grab	Grab
Collection Date:	Federal	15-Dec-97	15-Dec-97	15-Dec-97	15-Dec-97
Units:	SDWA MCLs (ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
2-Chloronaphthalene		9.8 U	9.8 U	9.9 U	9.8 U
Acenaphthene		9.8 U	9.8 U	9.9 U	9.8 U
Acenaphthylene		9.8 U	9.8 U	9.9 U	9.8 U
Anthracene		9.8 U	9.8 U	9.9 U	9.8 U
Benzene	5	2 U	2 U	2 U	2 U
Benzo(a)anthracene		9.8 U	9.8 U	9.9 U	9.8 U
Benzo(a)pyrene	0.2	**9.8 U**	**9.8 U**	**9.9 U**	**9.8 U**
Benzo(b)fluoranthene		9.8 U	9.8 U	9.9 U	9.8 U
Benzo(g,h,i)perylene		9.8 U	9.8 U	9.9 U	9.8 U
Benzo(k)fluoranthene		9.8 U	9.8 U	9.9 U	9.8 U
Chrysene		9.8 U	9.8 U	9.9 U	9.8 U
Dibenzo(a,h)anthracene		9.8 U	9.8 U	9.9 U	9.8 U
Ethylbenzene	700	2 U	2 U	2 U	2 U
Fluoranthene		9.8 U	9.8 U	9.9 U	9.8 U
Fluorene		9.8 U	9.8 U	9.9 U	9.8 U
Indeno(1,2,3-cd)pyrene		9.8 U	9.8 U	9.9 U	9.8 U
Iron (dissolved)		384 =	397 =	390 =	479 =
Naphthalene		9.8 U	9.8 U	9.9 U	9.8 U
Phenanthrene		9.8 U	9.8 U	9.9 U	9.8 U
Pyrene		9.8 U	9.8 U	9.9 U	9.8 U
Toluene	1000	2 U	2 U	2 U	2 U
Xylenes, Total	10000	4 U	4 U	4 U	4 U

10	Bold values indicate results exceeding Federal Safe Drinking Water Act Maximum Contaminant Levels.
U	Indicates that the compound was not detected above the reported sample quantitation limit
J	Indicates that the value for the compound was an estimated value
UJ	Indicates that the sample was not detected above an approximate sample quantitation limit
R	Indicates that the sample results are unusable and the presence or absence of the compound could not be verified
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Table II-6. Geotechnical Results for Soil Samples Collected at the UST 70 Site, Facility ID #9-089019

Parameter	26-06	26-07	26-08	26-09
Depth Interval (ft BGS)	5.0 - 7.0	10.0 - 12.5	17.5 - 20.0	12.5 - 15.0
USCS Code	SP	SP	SP	SP
Grain size analysis - % Clay	0	0	0	0
Grain size analysis - % Silt	2	2	3	5
Grain size analysis - % Sand	92	98	97	95
Grain size analysis - % Gravel	6	0	0	0
Liquid Limit	NP	NP	NP	NP
Plastic Limit	NP	NP	NP	NP
Plasticity Index	NP	NP	NP	NP
Natural Moisture Content (%)	33.2	8.2	24.0	10.8
Permeability (cm/sec)	4.68×10^{-4}	NA	NA	NA
Porosity	0.42	NA	NA	NA
Specific Gravity	2.65	NA	NA	NA

NP Non plastic

NA Not applicable, samples were not analyzed for specific geotechnical parameter

Table II-7. Hydropunch (Part A SI) and Monitoring Well (Part B SI) Construction Details at the UST 70 Site, Facility ID #9-089019

Boring/Well Number	Date Installed	Boring Depth (ft BGS)	Screened Interval (ft BGS)	Base of Seal (ft BGS)	Type of Completion	Ground Surface Elevation (ft NAD 29)	Top of Casing Elevation (ft NAD 29)
26-01	9/17/96	21.6	15.5 - 20.5	n/a	hydropunch	91.24	n/a
26-02	9/18/96	20.0	15.0 - 20.0	n/a	hydropunch	91.21	n/a
26-03	12/11/96	12.0	10.0 - 11.0	n/a	hydropunch	91.16	n/a
26-04	12/11/96	18.5	13.5 - 18.5	n/a	hydropunch	90.98	n/a
26-05	12/11/96	22.5	17.5 - 22.5	n/a	hydropunch	90.94	n/a
26-06	11/6/97	20.0	10.0 - 20.0	8.0	flush mount	n/a	90.26
26-07	11/5/97	25.0	15.0 - 25.0	13.0	flush mount	n/a	90.07
26-08	11/5/97	30.0	12.0 - 22.0	10.0	flush mount	n/a	90.05
26-09	11/5/97	20.0	10.0 - 20.0	8.0	flush mount	n/a	88.67

Table II-8. Water Level Measurements at the UST 70 Site, Facility ID #9-089019

Boring/Well Number	Date	Measuring Point Elevation (ft NAD 29)	Depth to Water (ft BMP)	Groundwater Elevation (ft NAD 29)
CAP Part A Investigation				
26-01	9/18/96	91.24	16.82	74.42
26-02	9/18/96	91.21	17.06	74.15
26-03	12/12/96	91.16	6.78	83.83
26-04	12/13/96	90.98	17.84	73.14
26-05	12/19/96	90.94	16.84	74.10
CAP Part B Investigation				
26-06	12/15/97	90.26	16.59	73.67
26-07	12/15/97	90.07	16.14	73.93
26-08	12/15/97	90.05	15.87	74.18
26-09	12/15/97	88.67	14.09	74.65

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

Table III-1. Risk-based Screening of Part A Soil Data at the UST 70 Site, Facility ID #9-089019

Station:	Screening Levels			26-01	26-01	26-02	26-02	26-03
Sample ID:	GA UST Corrective Action Levels for Soil[a] (ug/kg)	Risk-based		2601H1	2601J1	2602E1	2602F1	2603A1
Sample Interval:		Screening Level[b] (ug/kg)	Leaching to Groundwater[c] (ug/kg)	17.5' - 20.0'	20.0' - 21.6'	10.0' - 12.5'	12.5' - 15.0'	0.0' - 2.5'
Media:				Soil	Soil	Soil	Soil	Soil
Sample Type:				Grab	Grab	Grab	Grab	Grab
Collection Date:				17-Sep-96	17-Sep-96	18-Sep-96	18-Sep-96	11-Dec-96
Units:				(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2-Chloronaphthalene[d]	N/A[e]	82000000	84000	406 U	416 U	351 U	414 U	342 U
Acenaphthene	N/A[e]	120000000	570000	406 UJ	416 U	351 U	414 U	342 U
Acenaphthylene	ND	61000000	4200000	406 U	416 U	351 U	414 U	342 U
Anthracene	N/A[e]	610000000	12000000	406 U	416 U	351 UJ	414 UJ	342 U
Benzene	8	200000	30	6.1 U	6.3 U	**54 U**	6.4 UJ	5.2 U
Benzo(a)anthracene	N/A[e]	7800	2000	406 U	416 U	351 UJ	414 UJ	342 U
Benzo(a)pyrene	N/A[e]	780	8000	406 U	416 U	351 UJ	414 U	342 U
Benzo(b)fluoranthene	N/A[e]	7800	5000	406 U	416 U	351 UJ	414 U	342 U
Benzo(g,h,i)perylene	N/A[e]			406 U	416 U	351 UJ	414 U	342 U
Benzo(k)fluoranthene	N/A[e]	78000	49000	406 U	416 U	351 UJ	414 U	342 U
Chrysene	N/A[e]	780000	160000	406 U	416 U	351 UJ	414 UJ	342 U
Dibenzo(a,h)anthracene	N/A[e]	780	2000	406 U	416 U	351 UJ	414 U	342 U
Ethylbenzene	10000	200000000	13000	6.1 U	16 =	68 J	51 J	5.2 U
Fluoranthene	N/A[e]	82000000	4300000	406 U	416 U	351 UJ	414 UJ	342 U
Fluorene	N/A[e]	82000000	560000	406 U	416 U	351 U	414 U	342 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7800	14000	406 U	416 U	351 UJ	414 U	342 U
Lead	--	5000000	--		1700 U		5000 U	
Naphthalene	N/A[e]	82000000	84000	406 U	416 U	513 =	414 U	342 U
Phenanthrene[f]	N/A[e]	61000000	4200000	406 U	416 U	2370 J	1270 J	342 U
Pyrene	N/A[e]	61000000	4200000	406 U	416 U	351 UJ	414 UJ	342 U
Toluene	6000	410000000	12000	13 J	40 =	54 U	18 J	14.1 =
Total Petroleum Hydrocarbons	--	--	--	5360 U	128000 =	24000000 =	13400000 =	189000 =
Xylenes, Total	700000	1000000000	190000	21 J	120 =	120 J	460 J	5.2 U

[a] Average or higher groundwater pollution susceptability 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.
U Indicates that the compound was not detected above the reported sample quantitation limit
J Indicates that the value for the compound was an estimated value
UJ Indicates that the sample was not detected above an approximate sample quantitation limit
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Table III-1. continued

Station:	Screening Levels			26-03	26-04	26-04	26-05	26-05
Sample ID:	GA UST			2603C1	2604A1	2604D1	2605A1	2605C1
Sample Interval:	Corrective			5.0' - 7.5'	0.0' - 2.5'	7.5' - 10.0'	0.0' - 2.5'	5.0' - 7.5'
Media:	Action	Risk-based		Soil	Soil	Soil	Soil	Soil
Sample Type:	Levels	Screening	Leaching to	Grab	Grab	Grab	Grab	Grab
Collection Date:	for Soil[a]	Level[b]	Groundwater[c]	11-Dec-96	11-Dec-96	11-Dec-96	11-Dec-96	11-Dec-96
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2-Chloronaphthalene[d]	N/A[e]	82000000	84000	372 U	337 U	352 U	363 U	352 U
Acenaphthene	N/A[e]	120000000	570000	372 U	337 U	352 U	363 U	352 U
Acenaphthylene	ND	61000000	4200000	372 U	337 U	352 U	363 U	352 U
Anthracene	N/A[e]	610000000	12000000	372 U	337 U	352 U	363 U	352 U
Benzene	8	200000	30	5.7 U	5.1 U	5.4 U	5.5 U	5.3 U
Benzo(a)anthracene	N/A[e]	7800	2000	372 U	337 U	352 U	363 U	352 U
Benzo(a)pyrene	N/A[e]	780	8000	372 U	337 U	352 U	363 U	352 U
Benzo(b)fluoranthene	N/A[e]	7800	5000	372 U	337 U	352 U	363 U	352 U
Benzo(g,h,i)perylene	N/A[e]			372 U	337 U	352 U	363 U	352 U
Benzo(k)fluoranthene	N/A[e]	78000	49000	372 U	337 U	352 U	363 U	352 U
Chrysene	N/A[e]	780000	160000	372 U	337 U	352 U	363 U	352 U
Dibenzo(a,h)anthracene	N/A[e]	780	2000	372 U	337 U	352 U	363 U	352 U
Ethylbenzene	10000	200000000	13000	5.7 U	5.1 U	5.4 U	5.5 U	5.3 U
Fluoranthene	N/A[e]	82000000	4300000	372 U	337 U	352 U	363 U	352 U
Fluorene	N/A[e]	82000000	560000	372 U	337 U	352 U	363 U	352 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7800	14000	372 U	337 U	352 U	363 U	352 U
Lead	--	5000000	--	7500 =	11700 =		7300 =	
Naphthalene	N/A[e]	82000000	84000	372 U	337 U	352 U	363 U	352 U
Phenanthrene[f]	N/A[e]	61000000	4200000	372 U	337 U	352 U	363 U	352 U
Pyrene	N/A[e]	61000000	4200000	372 U	337 U	352 U	363 U	352 U
Toluene	6000	410000000	12000	5.7 U	15.7 =	5.4 U	8.3 J	180 =
Total Petroleum Hydrocarbons	--	--	--	53500 =	150000 =	22800 =	109000 =	10600 U
Xylenes, Total	700000	1000000000	190000	5.7 U	5.1 U	5.4 U	5.5 U	5.3 U

[a] Average or higher groundwater pollution susceptability 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.
U Indicates that the compound was not detected above the reported sample quantitation limit
J Indicates that the value for the compound was an estimated value.
UJ Indicates that the sample was not detected above an approximate sample quantitation limit
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified
= Indicates that the compound was detected at the concentration reported

Table III-2. Risk-based Screening of Part B Soil Data at the UST 70 Site, Facility ID #9-089019

Station:	Screening Levels			26-06	26-06	26-07	26-07	26-08
Sample ID:	GA UST Corrective Action Levels for Soil[a] (ug/kg)	Risk-based		260611	260621	260711	260721	260811
Sample Interval:		Screening Level[b] (ug/kg)	Leaching to Groundwater[c] (ug/kg)	7.5' - 10.0'	15.0' - 17.5'	7.5' - 10.0'	15.0' - 17.5'	22.5' - 25.0'
Media:				Soil	Soil	Soil	Soil	Soil
Sample Type:				Grab	Grab	Grab	Grab	Grab
Collection Date:				06-Nov-97	06-Nov-97	5-Nov-97	5-Nov-97	5-Nov-97
Units:				(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2-Chloronaphthalene[d]	N/A[e]	82000000	84000	388 U	392 U	370 U	417 U	450 U
Acenaphthene	N/A[e]	120000000	570000	388 U	392 U	370 U	417 U	450 U
Acenaphthylene	ND	61000000	4200000	388 U	392 U	370 U	417 U	450 U
Anthracene	N/A[e]	610000000	12000000	388 U	392 U	370 U	417 U	450 U
Benzene	8	200000	30	2.3 U	2.4 U	2.2 U	2.5 U	2.7 U
Benzo(a)anthracene	N/A[e]	7800	2000	388 U	392 U	370 U	417 U	450 U
Benzo(a)pyrene	N/A[e]	780	8000	388 U	392 U	370 U	417 U	450 U
Benzo(b)fluoranthene	N/A[e]	7800	5000	388 U	392 U	370 U	417 U	450 U
Benzo(g,h,i)perylene	N/A[e]			388 U	392 U	370 U	417 U	450 U
Benzo(k)fluoranthene	N/A[e]	78000	49000	388 U	392 U	370 U	417 U	450 U
Chrysene	N/A[e]	780000	160000	388 U	392 U	370 U	417 U	450 U
Dibenzo(a,h)anthracene	N/A[e]	780	2000	388 U	392 U	370 U	417 U	450 U
Ethylbenzene	10000	200000000	13000	2.3 U	2.4 U	2.2 U	2.5 U	2.7 U
Fluoranthene	N/A[e]	82000000	4300000	388 U	392 U	370 U	417 U	450 U
Fluorene	N/A[e]	82000000	560000	388 U	392 U	370 U	417 U	450 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7800	14000	388 U	392 U	370 U	417 U	450 U
Lead	--	5000000	--		3000 =		6400 =	
Naphthalene	N/A[e]	82000000	84000	388 U	392 U	370 U	417 U	450 U
Phenanthrene[f]	N/A[e]	61000000	4200000	388 U	392 U	370 U	417 U	450 U
Pyrene	N/A[e]	61000000	4200000	388 U	392 U	370 U	417 U	450 U
Toluene	6000	410000000	12000	2.3 U	2.4 U	2.2 U	2.5 U	2.7 U
Total Organic Carbon					10600000 =		15200000 =	
Total Petroleum Hydrocarbons	--	--	--	217000 =	2660 U	14600 =	4010 U	6160 U
Xylenes, Total	700000	1000000000	190000	4.6 U	4.7 U	4.5 U	5 U	5.4 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.

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

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

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

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

= Indicates that the compound was detected at the concentration reported

Table III-2. continued

Station:	Screening Levels			26-08	26-09	26-09
Sample ID:	GA UST			260821	260911	260921
Sample Interval:	Corrective			27.5' - 30.0'	0.0' - 2.5'	12.5' - 15.0'
Media:	Action	Risk-based		Soil	Soil	Soil
Sample Type:	Levels	Screening	Leaching to	Grab	Grab	Grab
Collection Date:	for Soil[a]	Level[b]	Groundwater[c]	5-Nov-97	5-Nov-97	5-Nov-97
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2-Chloronaphthalene[d]	N/A[e]	82000000	84000	426 U	375 U	13700 U
Acenaphthene	N/A[e]	120000000	570000	426 U	375 U	13700 U
Acenaphthylene	ND	61000000	4200000	426 U	375 U	13700 U
Anthracene	N/A[e]	610000000	12000000	426 U	375 U	13700 U
Benzene	8	200000	30	2.6 U	2.3 U	2.1 U
Benzo(a)anthracene	N/A[e]	7800	2000	426 U	375 U	*13700* *U*
Benzo(a)pyrene	N/A[e]	780	8000	426 U	375 U	*13700* *U*
Benzo(b)fluoranthene	N/A[e]	7800	5000	426 U	375 U	*13700* *U*
Benzo(g,h,i)perylene	N/A[e]			426 U	375 U	13700 U
Benzo(k)fluoranthene	N/A[e]	78000	49000	426 U	375 U	13700 U
Chrysene	N/A[e]	780000	160000	426 U	375 U	13700 U
Dibenzo(a,h)anthracene	N/A[e]	780	2000	426 U	375 U	*13700* *U*
Ethylbenzene	10000	200000000	13000	2.6 U	2.3 U	2.1 U
Fluoranthene	N/A[e]	82000000	4300000	426 U	375 U	13700 U
Fluorene	N/A[e]	82000000	560000	426 U	375 U	13700 U
Indeno(1,2,3-cd)pyrene	N/A[e]	7800	14000	426 U	375 U	*13700* *U*
Lead	--	5000000	--	2600 =		16900 =
Naphthalene	N/A[e]	82000000	84000	426 U	375 U	13700 U
Phenanthrene[f]	N/A[e]	61000000	4200000	426 U	375 U	13700 U
Pyrene	N/A[e]	61000000	4200000	426 U	375 U	13700 U
Toluene	6000	410000000	12000	2.6 U	2.3 U	2.1 U
Total Organic Carbon				6810000 =		3420000 =
Total Petroleum Hydrocarbons	--	--	--	6760 U		666000 =
Xylenes, Total	700000	1000000000	190000	5.3 U	4.5 U	4.1 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.
10 Underlined values indicate results exceeding leaching to groundwater screening levels.
U Indicates that the compound was not detected above the reported sample quantitation limit
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UJ Indicates that the sample was not detected above an approximate sample quantitation limit
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified
= Indicates that the compound was detected at the concentration reported

Table III-3. Risk-based Screening of Part A Groundwater Data at the UST 70 Site, Facility ID #9-089019

Station:	Screening Levels		26-01	26-02	26-03	26-04	26-05
Sample ID:			2601W2	2602W2	2603W2	2604W2	2605W2
Media:			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Sample Type:			Grab	Grab	Grab	Grab	Grab
Collection Date:	Federal SDWA MCLs	Risk-based Screening Level[a]	17-Sep-96	18-Sep-96	11-Dec-96	13-Dec-96	16-Dec-96
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
2-Chloronaphthalene[b]		1500	400 U	200 U	40 U	10 U	40 U
Acenaphthene		2200	400 U	200 U	40 U	10 U	40 U
Acenaphthylene		1100	400 U	200 U	40 U	10 U	40 U
Anthracene		11000	400 U	200 U	40 U	10 U	40 U
Benzene	5	0.36	**53.8** U	**14.8** J	5 U	**200** =	5 U
Benzo(a)anthracene		0.092	400 U	200 U	40 U	10 U	40 U
Benzo(a)pyrene	0.2	0.0092	**400** U	**200** U	**40** U	**10** U	**40** U
Benzo(b)fluoranthene		0.092	400 U	200 U	40 U	10 U	40 U
Benzo(g,h,i)perylene			400 U	200 U	40 U	10 U	40 U
Benzo(k)fluoranthene		0.92	400 U	200 U	40 U	10 U	40 U
Chrysene		9.2	400 U	200 U	40 U	10 U	40 U
Dibenzo(a,h)anthracene		0.0092	400 U	200 U	40 U	10 U	40 U
Ethylbenzene	700	1300	246 J	64.3 =	5 U	37.9 =	5 U
Fluoranthene		1500	400 U	200 U	40 U	10 U	40 U
Fluorene		1500	400 U	159 J	40 U	10 U	40 U
Indeno(1,2,3-cd)pyrene		0.092	400 U	200 U	40 U	10 U	40 U
Lead	15[d]				**52.7** =	**91.6** =	**2020** =
Naphthalene		1500	412 =	325 =	40 U	30.6 =	40 U
Phenanthrene[c]		1100	400 U	338 =	40 U	10 U	40 U
Pyrene		1100	400 U	200 U	40 U	10 U	40 U
Toluene	1000	750	683 =	153 =	0.42 J	229 =	5 U
Xylenes, Total	10000	12000	1400 =	367 =	5 U	129 =	5 U

[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 Maximum Contaminant Levels.
10 Underlined values indicate results exceeding risk-based screening levels.
U Indicates that the compound was not detected above the reported sample quantitation limit
J Indicates that the value for the compound was an estimated value
UJ Indicates that the sample was not detected above an approximate sample quantitation limit
R Indicates that the sample results are unusable and the presence or absence of the compound could not be verified
= Indicates that the compound was detected at the concentration reported

Table III-4. Risk-based Screening of Part B Groundwater Data at the UST 70 Site, Facility ID #9-089019

Station:			26-06	26-07	26-08	26-09
Sample ID:	Screening Levels		2606W2	2607W2	2608W2	2609W2
Media:		Risk-based	Groundwater	Groundwater	Groundwater	Groundwater
Sample Type:	Federal	Screening	Grab	Grab	Grab	Grab
Collection Date:	SDWA MCLs	Level[a]	15-Dec-97	15-Dec-97	15-Dec-97	15-Dec-97
Units:	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
2-Chloronaphthalene[b]		1500	9.8 U	9.8 U	9.9 U	9.8 U
Acenaphthene		2200	9.8 U	9.8 U	9.9 U	9.8 U
Acenaphthylene		1100	9.8 U	9.8 U	9.9 U	9.8 U
Anthracene		11000	9.8 U	9.8 U	9.9 U	9.8 U
Benzene	5	0.36	2 U	2 U	2 U	2 U
Benzo(a)anthracene		0.092	9.8 U	9.8 U	9.9 U	9.8 U
Benzo(a)pyrene	0.2	0.0092	**9.8 U**	**9.8 U**	**9.9 U**	**9.8 U**
Benzo(b)fluoranthene		0.092	9.8 U	9.8 U	9.9 U	9.8 U
Benzo(g,h,i)perylene			9.8 U	9.8 U	9.9 U	9.8 U
Benzo(k)fluoranthene		0.92	9.8 U	9.8 U	9.9 U	9.8 U
Chrysene		9.2	9.8 U	9.8 U	9.9 U	9.8 U
Dibenzo(a,h)anthracene		0.0092	9.8 U	9.8 U	9.9 U	9.8 U
Ethylbenzene	700	1300	2 U	2 U	2 U	2 U
Fluoranthene		1500	9.8 U	9.8 U	9.9 U	9.8 U
Fluorene		1500	9.8 U	9.8 U	9.9 U	9.8 U
Indeno(1,2,3-cd)pyrene		0.092	9.8 U	9.8 U	9.9 U	9.8 U
Iron (dissolved)			384 =	397 =	390 =	479 =
Naphthalene		1500	9.8 U	9.8 U	9.9 U	9.8 U
Phenanthrene[c]		1100	9.8 U	9.8 U	9.9 U	9.8 U
Pyrene		1100	9.8 U	9.8 U	9.9 U	9.8 U
Toluene	1000	750	2 U	2 U	2 U	2 U
Xylenes, Total	10000	12000	4 U	4 U	4 U	4 U

[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 Maximum Contaminant Levels.
10 Underlined values indicate results exceeding risk-based screening levels.
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Table III-5. Groundwater Remedial Alternatives Comparison for the UST 70 Site, Facility ID #9-089019

Remedy[a]	Meets Objectives for UST 70 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 air-borne 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 AFCEE Remediation Matrix - Hierarchy of Preferred Alternatives - Dissolved fuel in groundwater (BTEX), 1994.

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FIGURES

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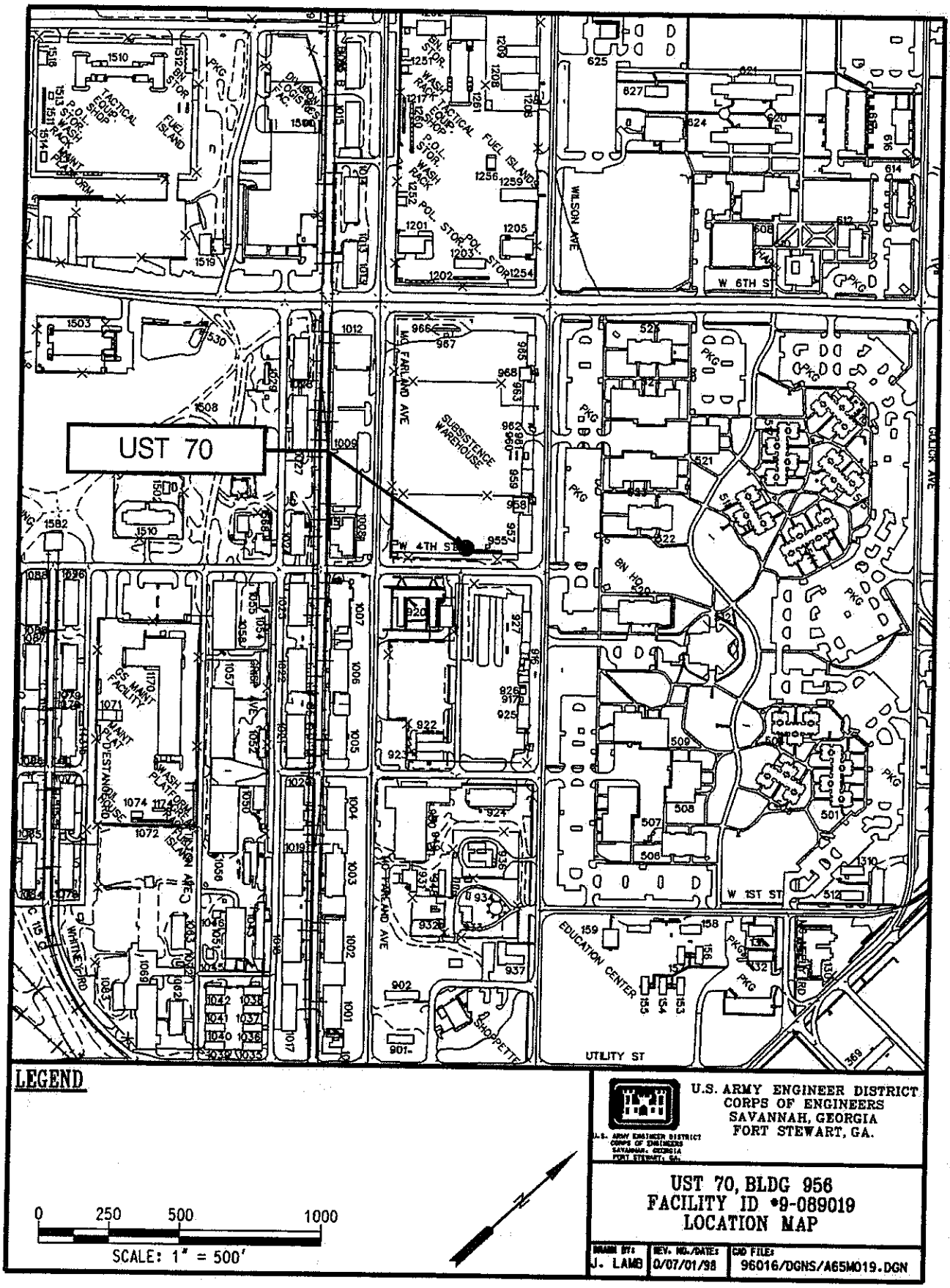


Figure II-1. Location Map for the UST 70 Site, Facility ID #9-089019

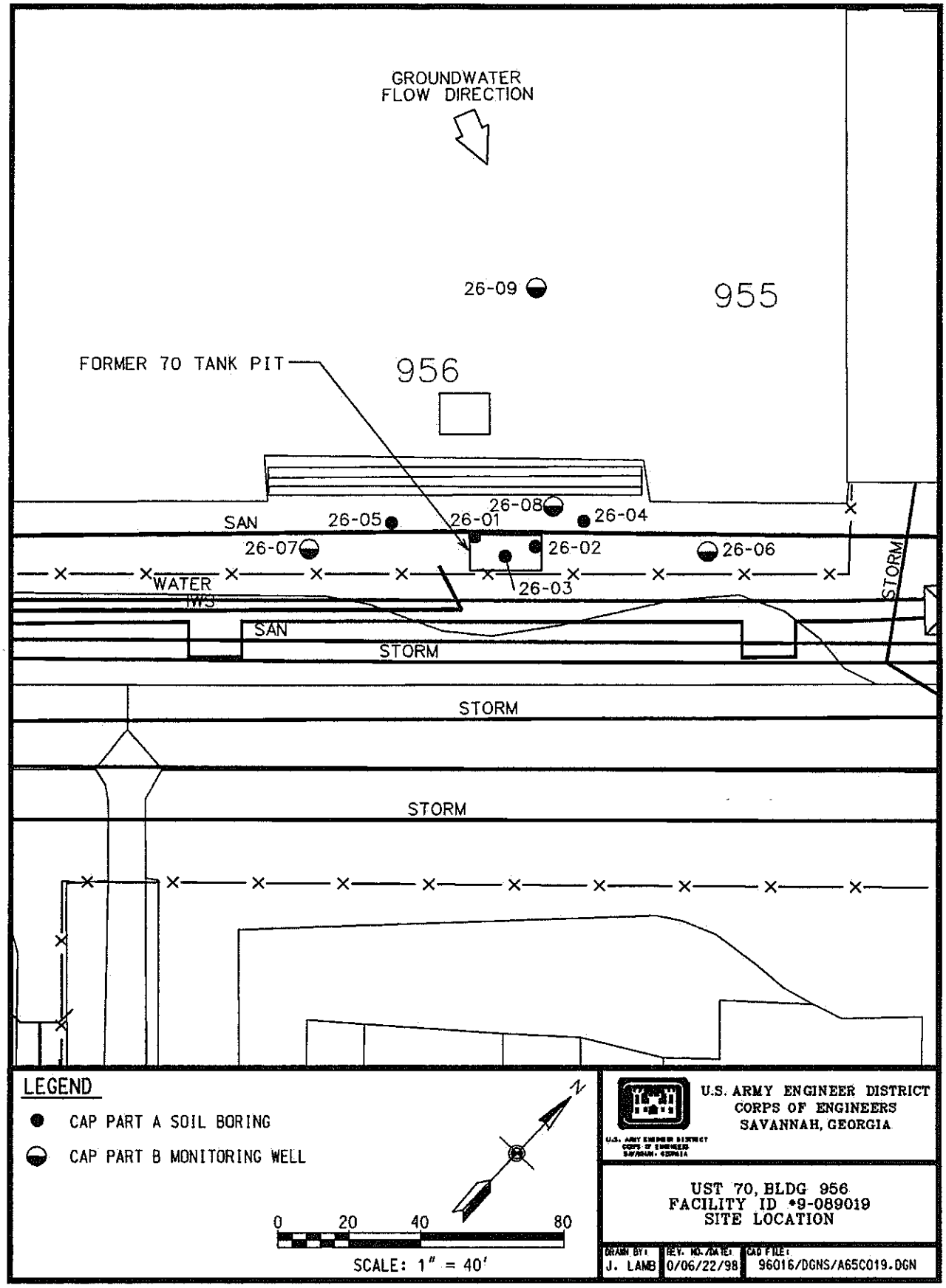
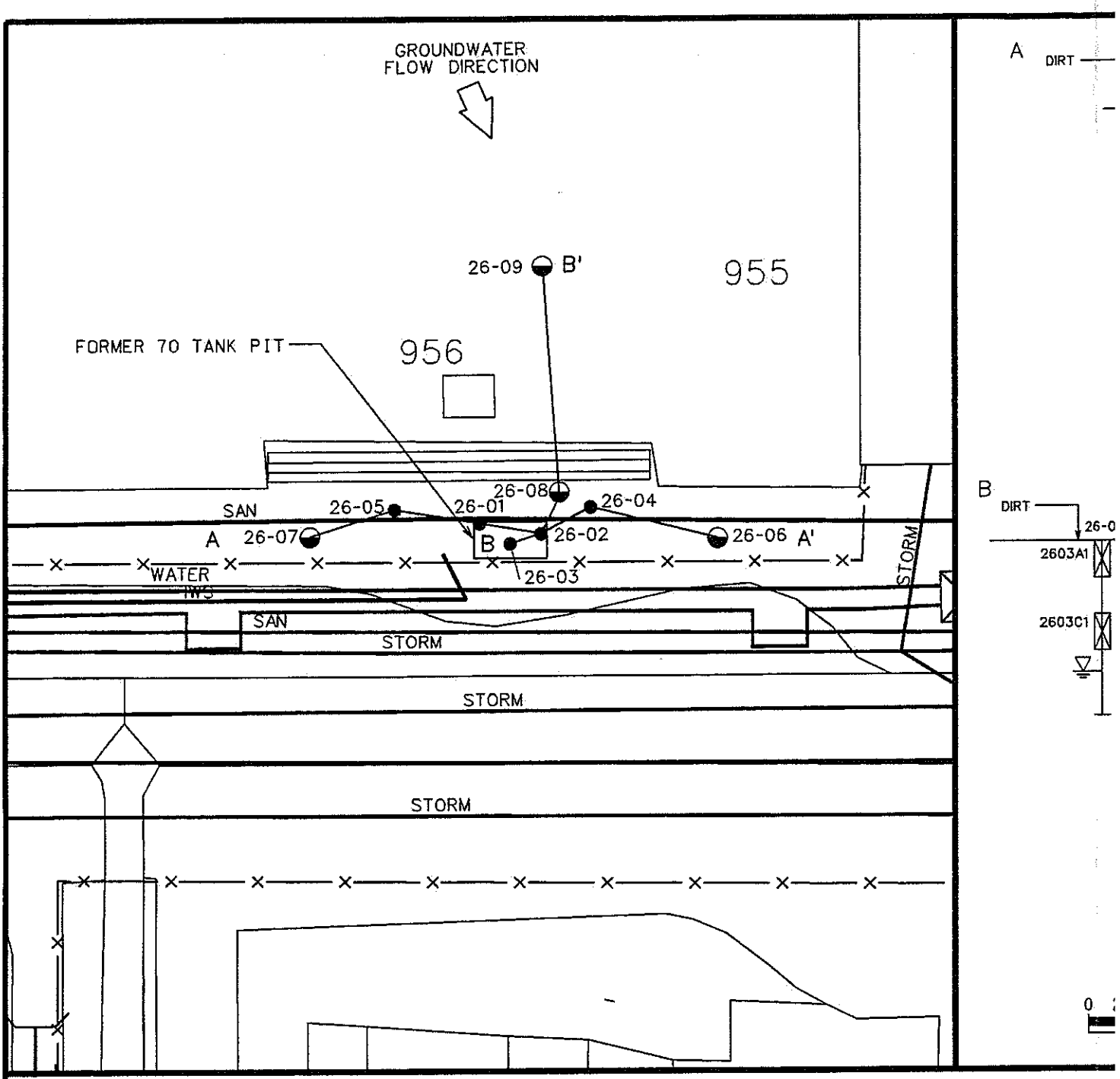


Figure II-2. Site Map of the UST 70 Site, Facility ID#9-089019



LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- SOIL SAMPLE INTERVAL
- SOIL SAMPLE INTERVAL WITH CONTAMINATION

B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES, TOTAL
BTL	BELOW THRESHOLD LEVELS
	APPROXIMATE WATER LEVEL

THRESHOLD LEVELS

B = 0.008 mg/kg

T = 6.0 mg/kg

E = 10.0 mg/kg

X = 700 mg/kg

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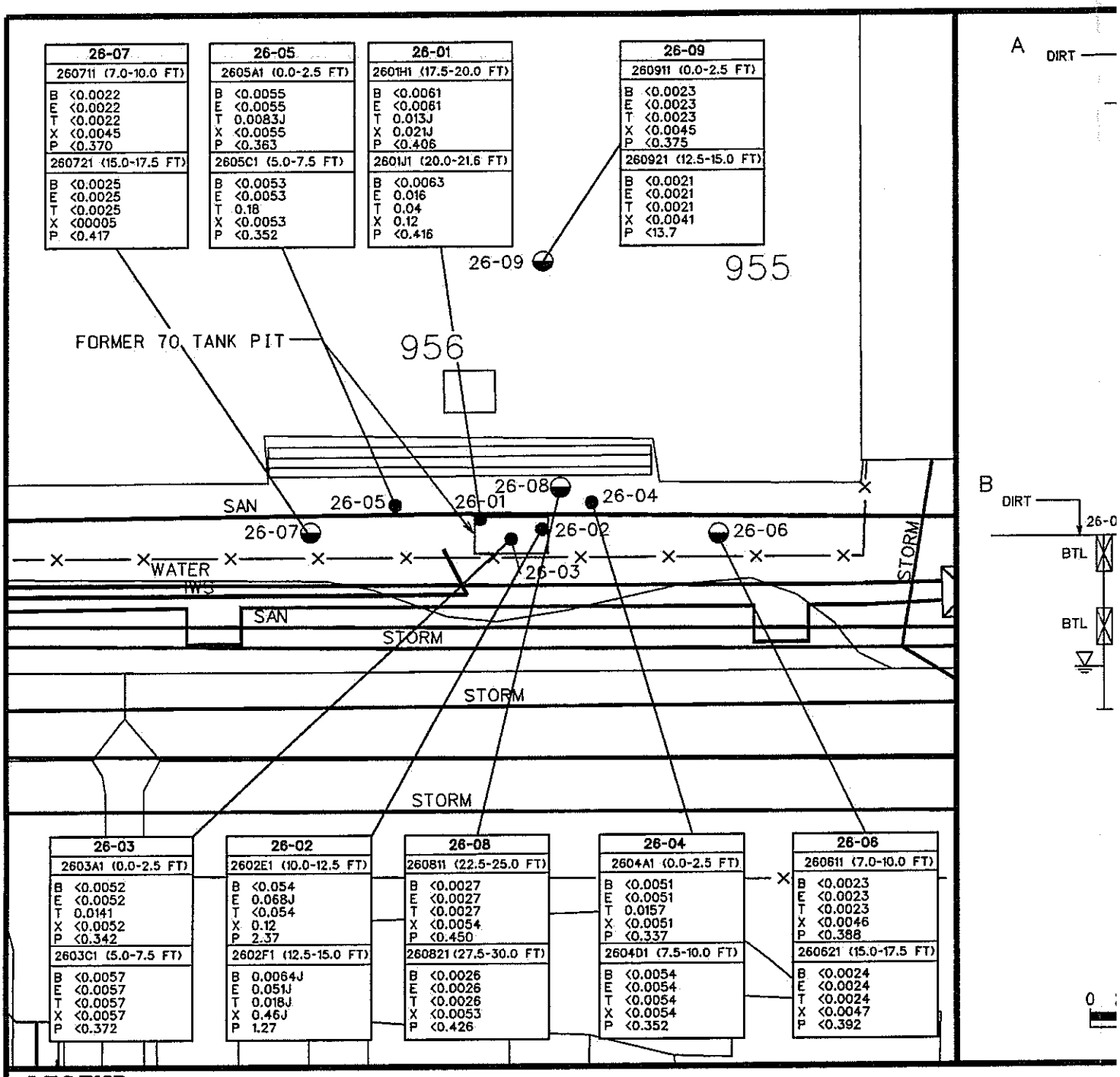

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SOIL SAMPLE INTERVAL
- SOIL SAMPLE INTERVAL WITH CONTAMINATION

B - BENZENE (mg/kg)
E - ETHYLBENZENE (mg/kg)
T - TOLUENCE (mg/kg)
X - XYLENES (mg/kg)
P - PAHs (mg/kg)
APPROXIMATE WATER LEVEL

THRESHOLD LEVELS

B - 0.008 mg/kg
T - 6.0 mg/kg
E - 10.0 mg/kg
X - 700 mg/kg

BTL - BELOW THRESHOLD LEVELS

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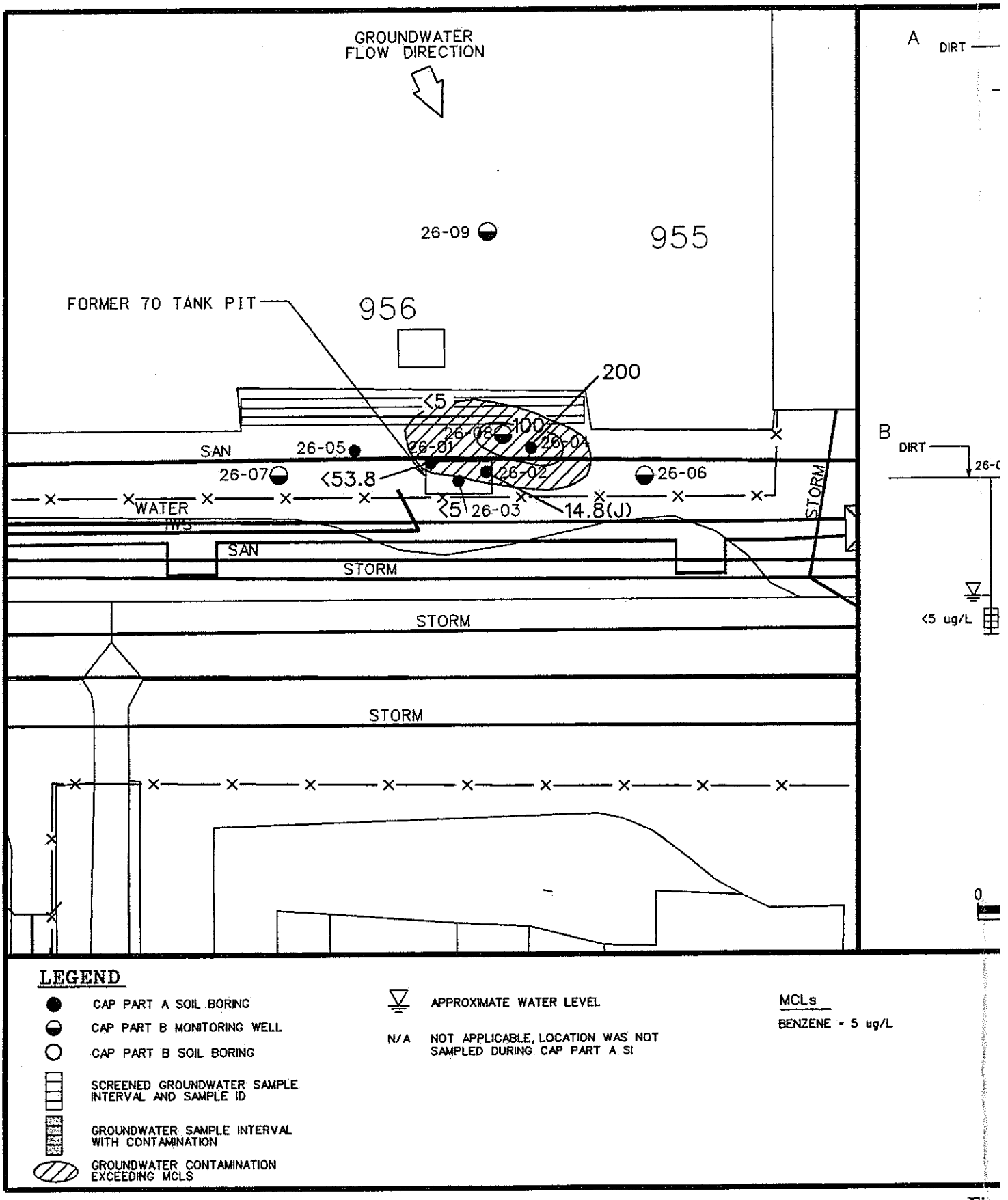
GROUNDWATER
FLOW DIRECTION
26-09
955
FORMER 70 TANK PIT
956
200
<5
100
26-08
26-01
26-04
SAN
26-05
26-07
<53.8
26-02
26-06
WATER
<5
26-03
14.8(J)
STORM
SAN
STORM
STORM
STORM
A
DIRT
B
DIRT
26-0
<5 ug/L
0
LEGEND
CAP PART A SOIL BORING
CAP PART B MONITORING WELL
CAP PART B SOIL BORING
SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
GROUNDWATER CONTAMINATION EXCEEDING MCLS
APPROXIMATE WATER LEVEL
N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART A SI
MCLs
BENZENE - 5 ug/L

Figu

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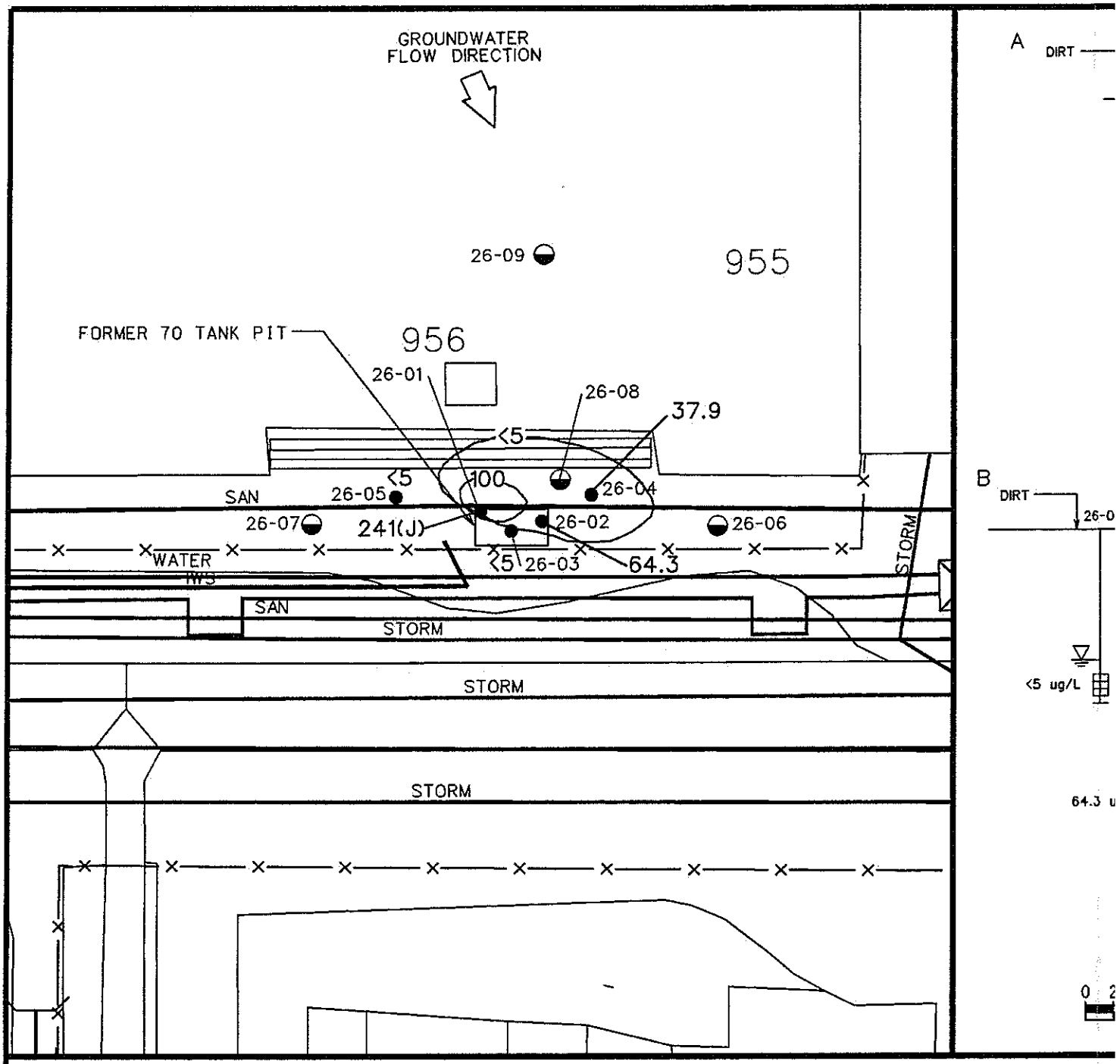

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART A SI

MCLs

ETHYLBENZENE = 700 ug/L

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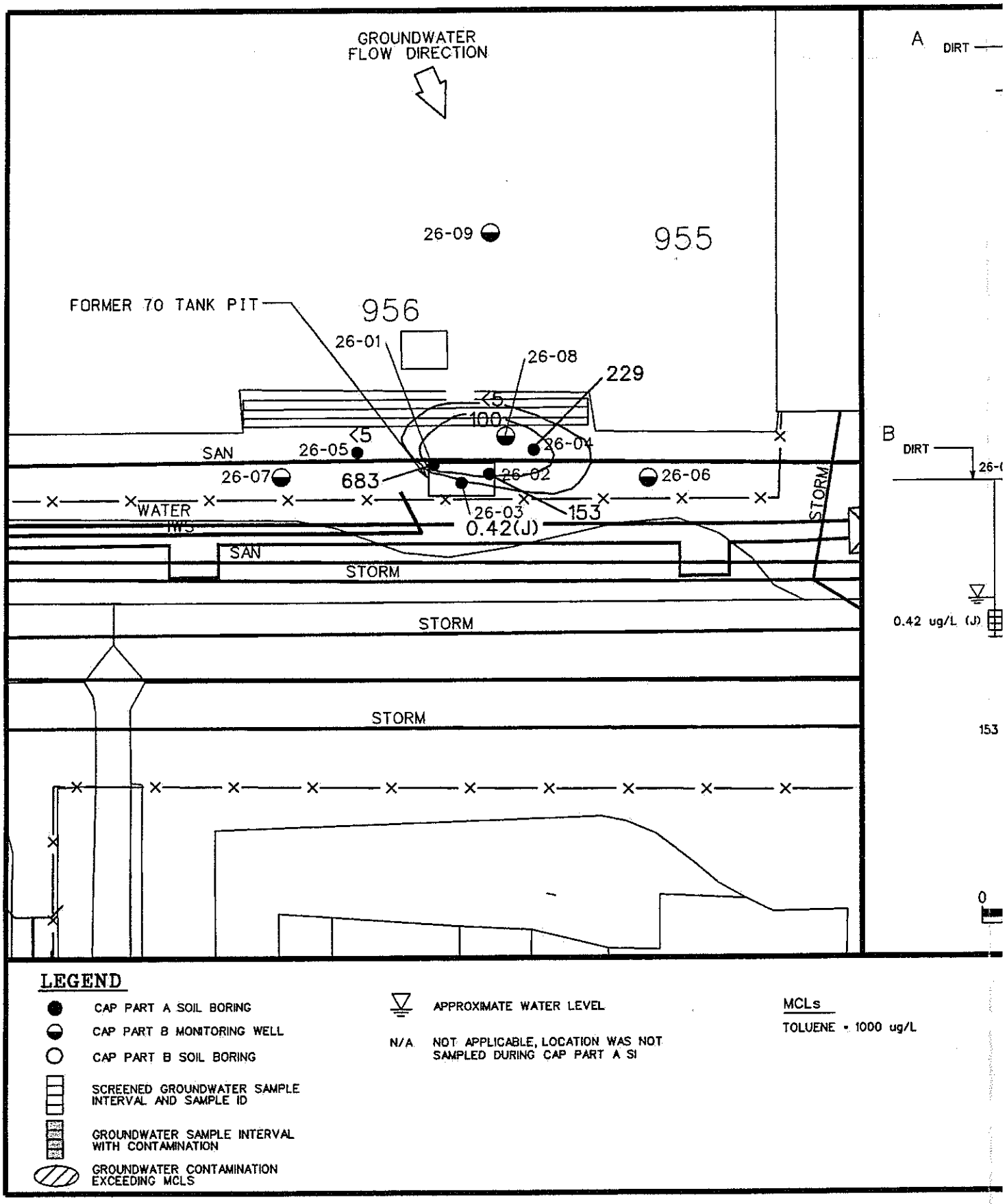
GROUNDWATER
FLOW DIRECTION
26-09
955
FORMER 70 TANK PIT
956
26-01
26-08
229
<5
100
<5
26-05
26-04
SAN
26-07
683
26-02
26-06
WATER
IWS
26-03
153
0.42(J)
STORM
SAN
STORM
STORM
STORM
A
DIRT
B
DIRT
0.42 ug/L (J)
153
0
LEGEND
CAP PART A SOIL BORING
CAP PART B MONITORING WELL
CAP PART B SOIL BORING
SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
GROUNDWATER CONTAMINATION EXCEEDING MCLS
APPROXIMATE WATER LEVEL
N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART A SI
MCLs
TOLUENE - 1000 ug/L

Fi

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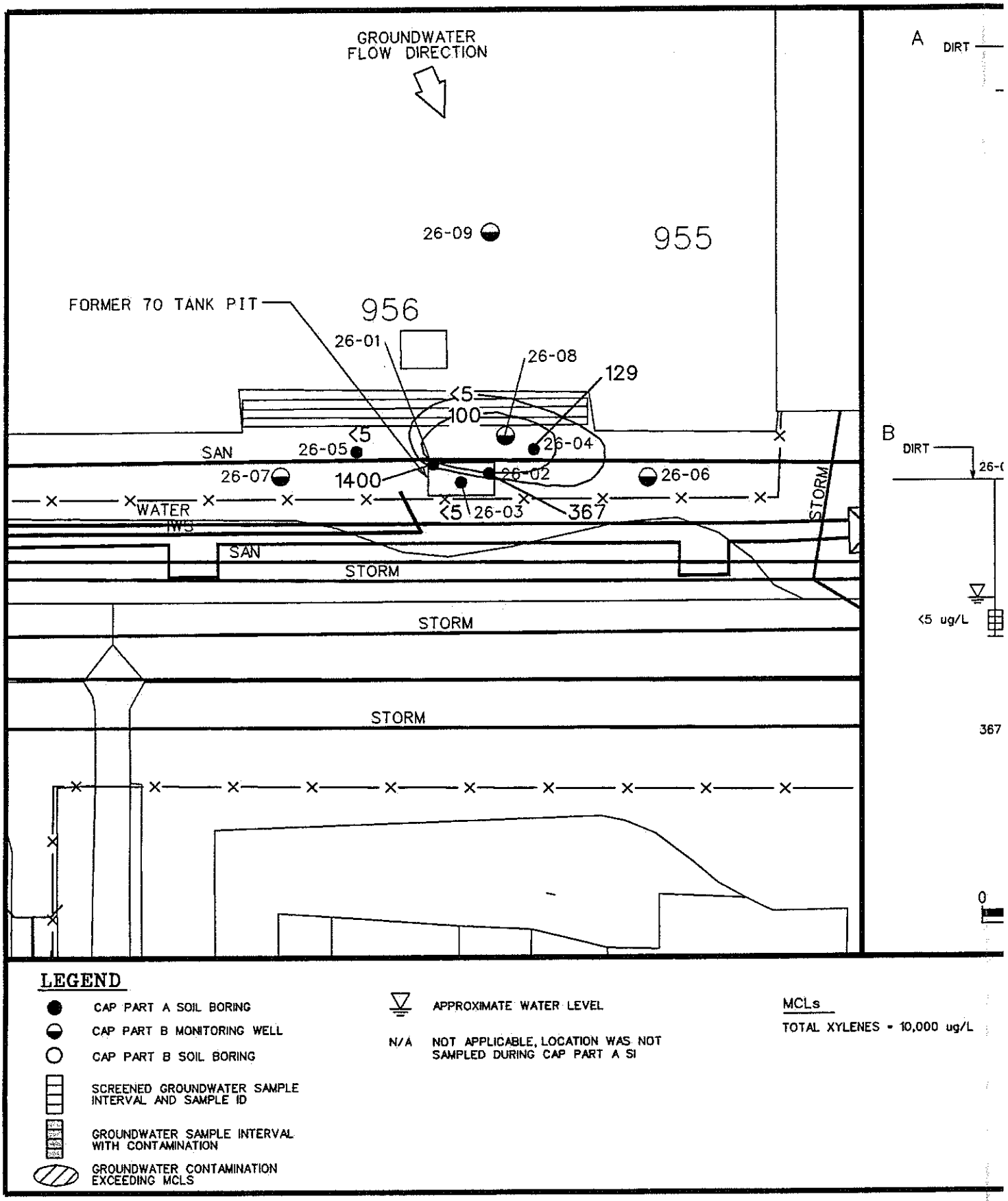

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART A SI

MCLs

TOTAL XYLENES = 10,000 ug/L

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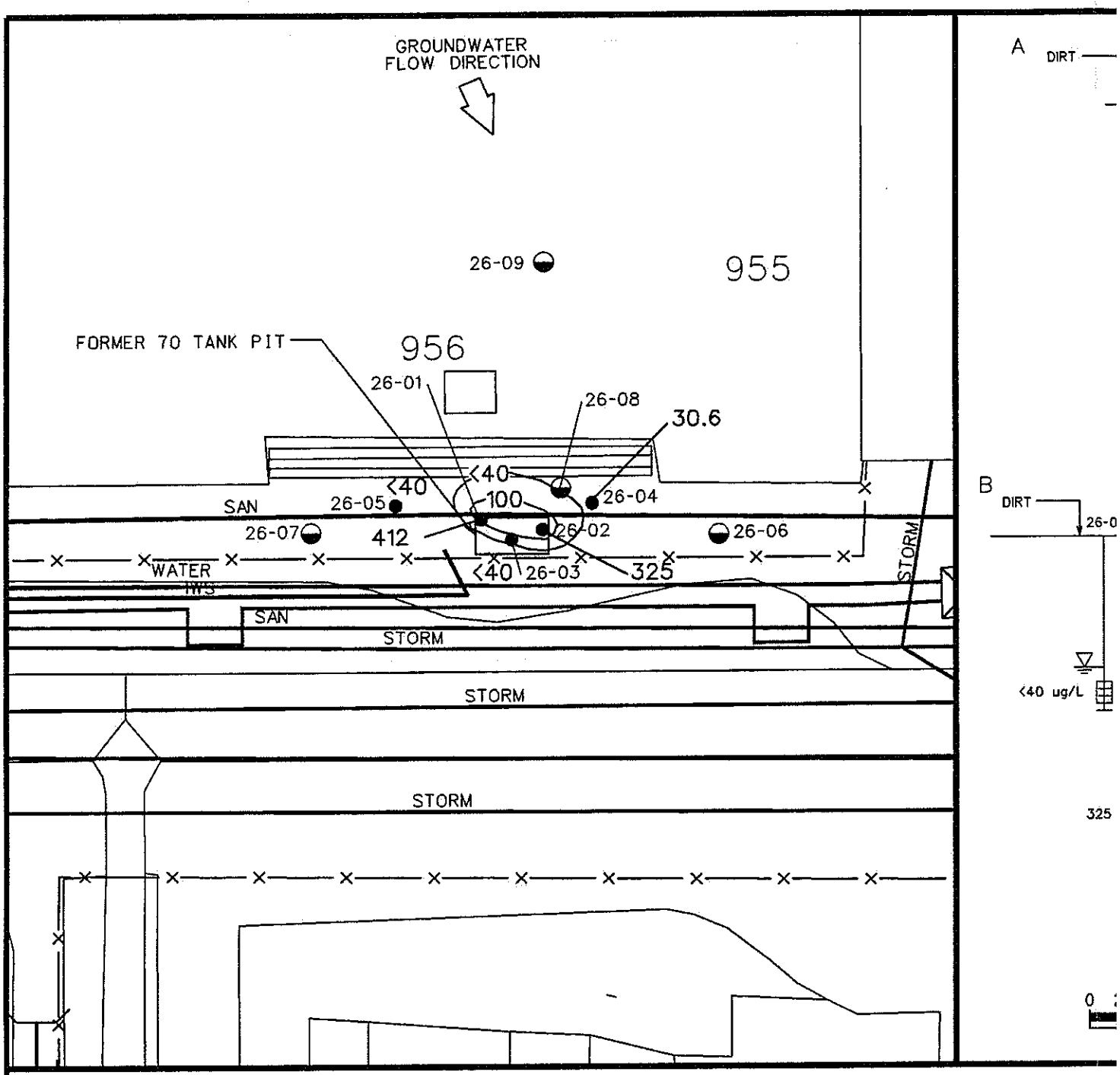

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART A SI

MCLs

NAPTHALENE - NONE

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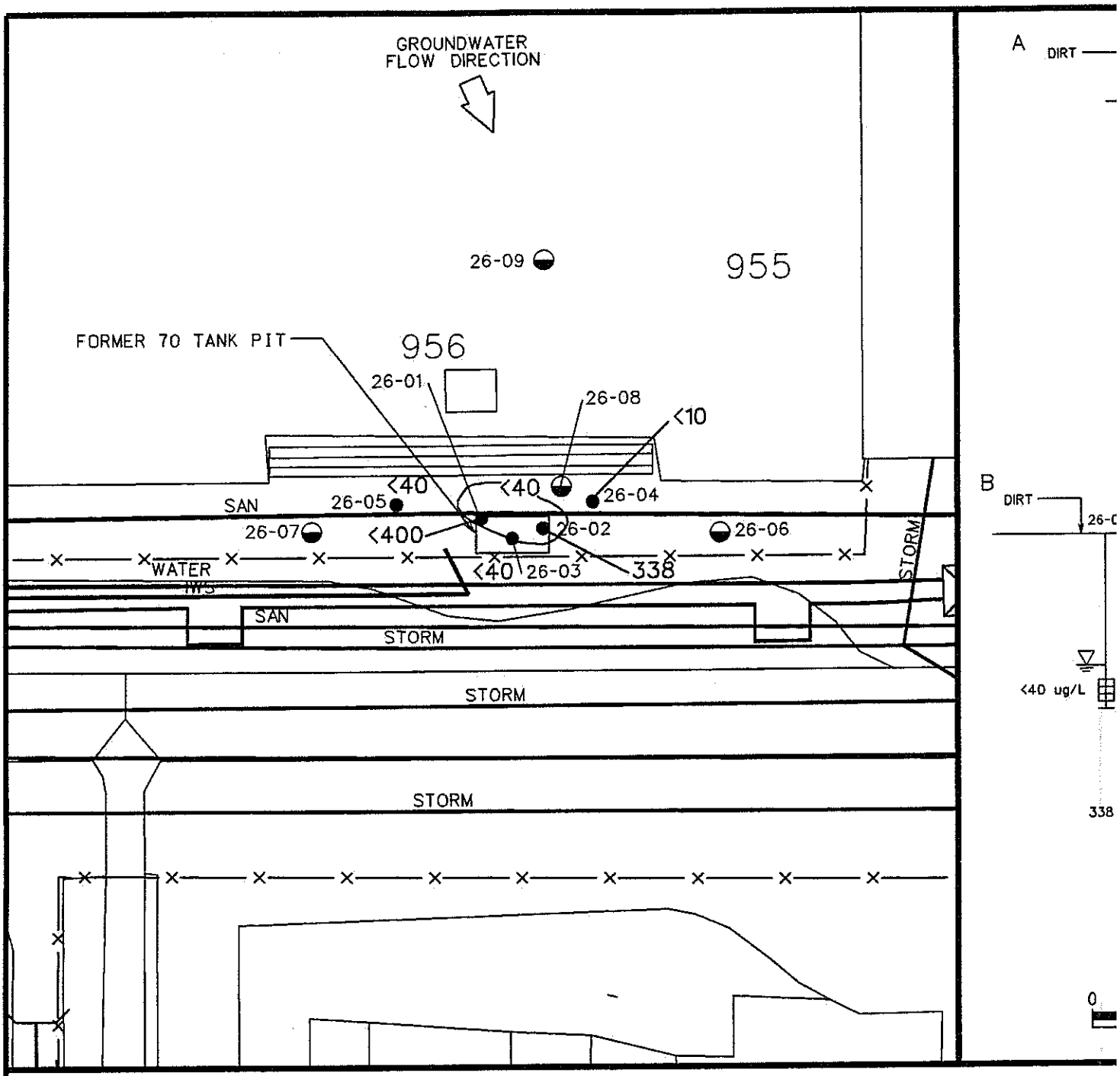

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART A SI

MCLs

PHENANTHRENE - NONE

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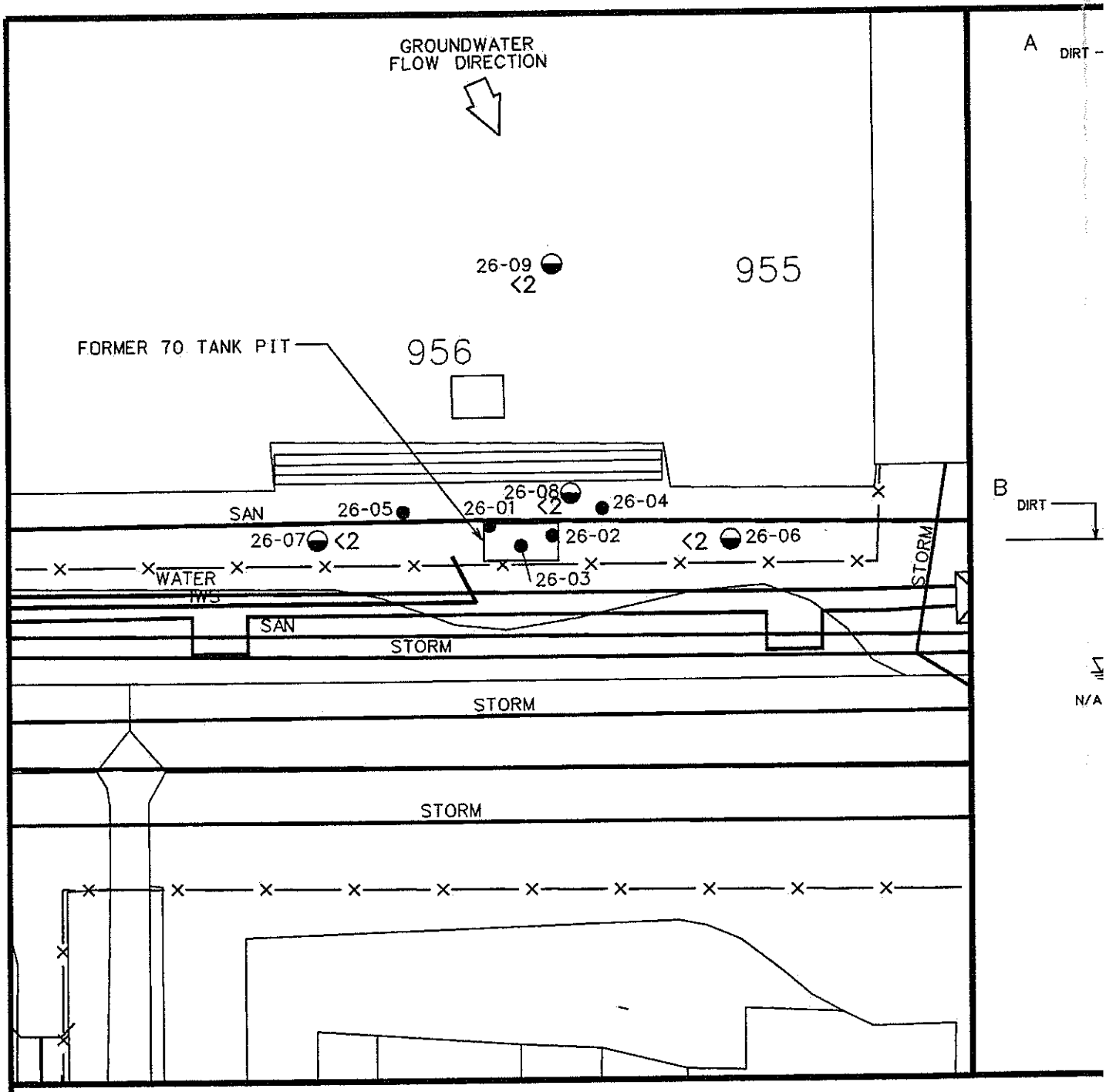

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART B SI

MCLs

BENZENE - 5 ug/L

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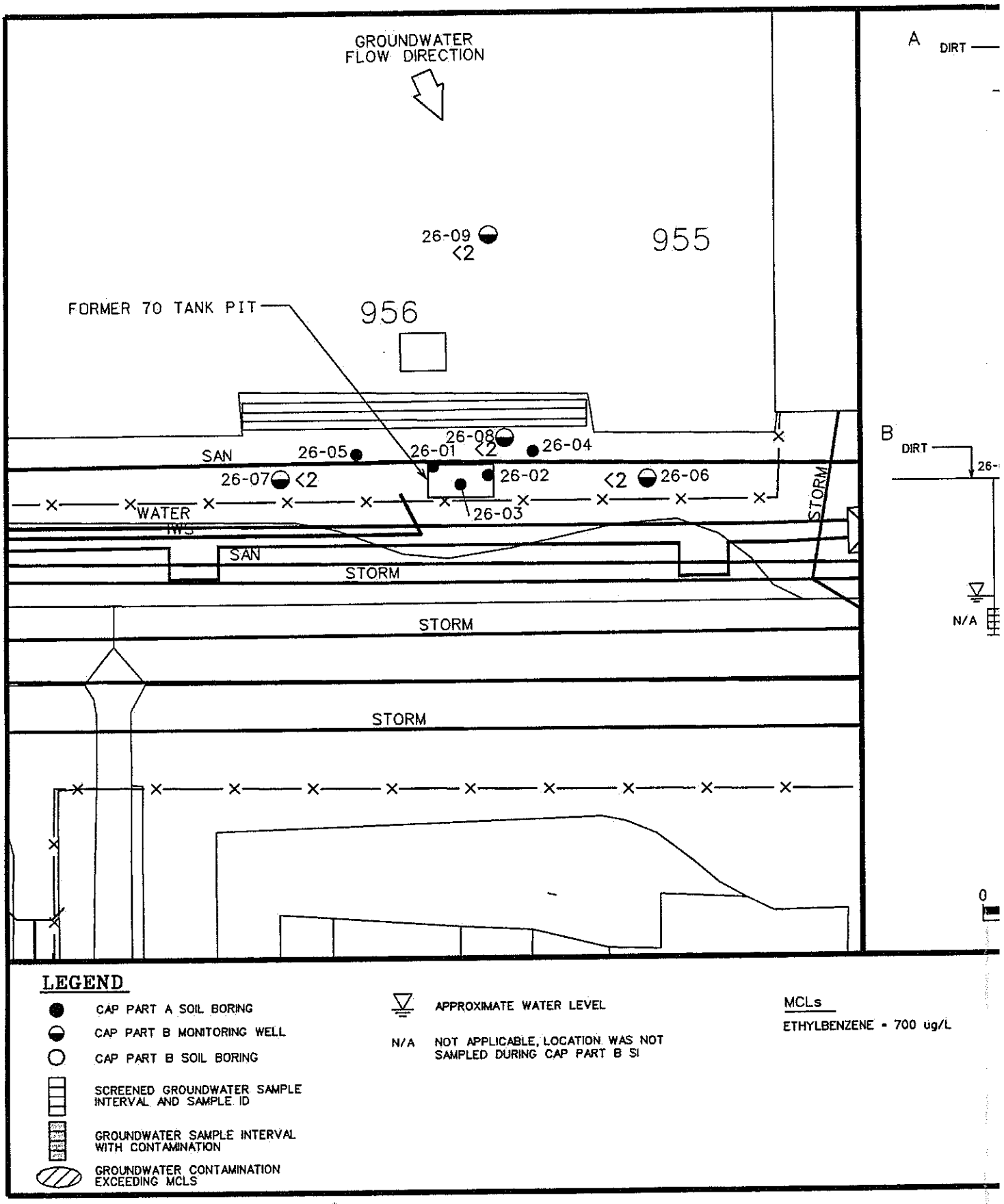
GROUNDWATER
FLOW DIRECTION
955
956
FORMER 70 TANK PIT
26-09
<2
26-08
26-05
26-01
<2
26-04
26-07
<2
26-02
<2
26-06
26-03
SAN
WATER
STORM
SAN
STORM
STORM
STORM
A
DIRT
B
DIRT
N/A
0
LEGEND
CAP PART A SOIL BORING
CAP PART B MONITORING WELL
CAP PART B SOIL BORING
SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
GROUNDWATER CONTAMINATION EXCEEDING MCLS
APPROXIMATE WATER LEVEL
N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART B SI
MCLs
ETHYLBENZENE - 700 ug/L

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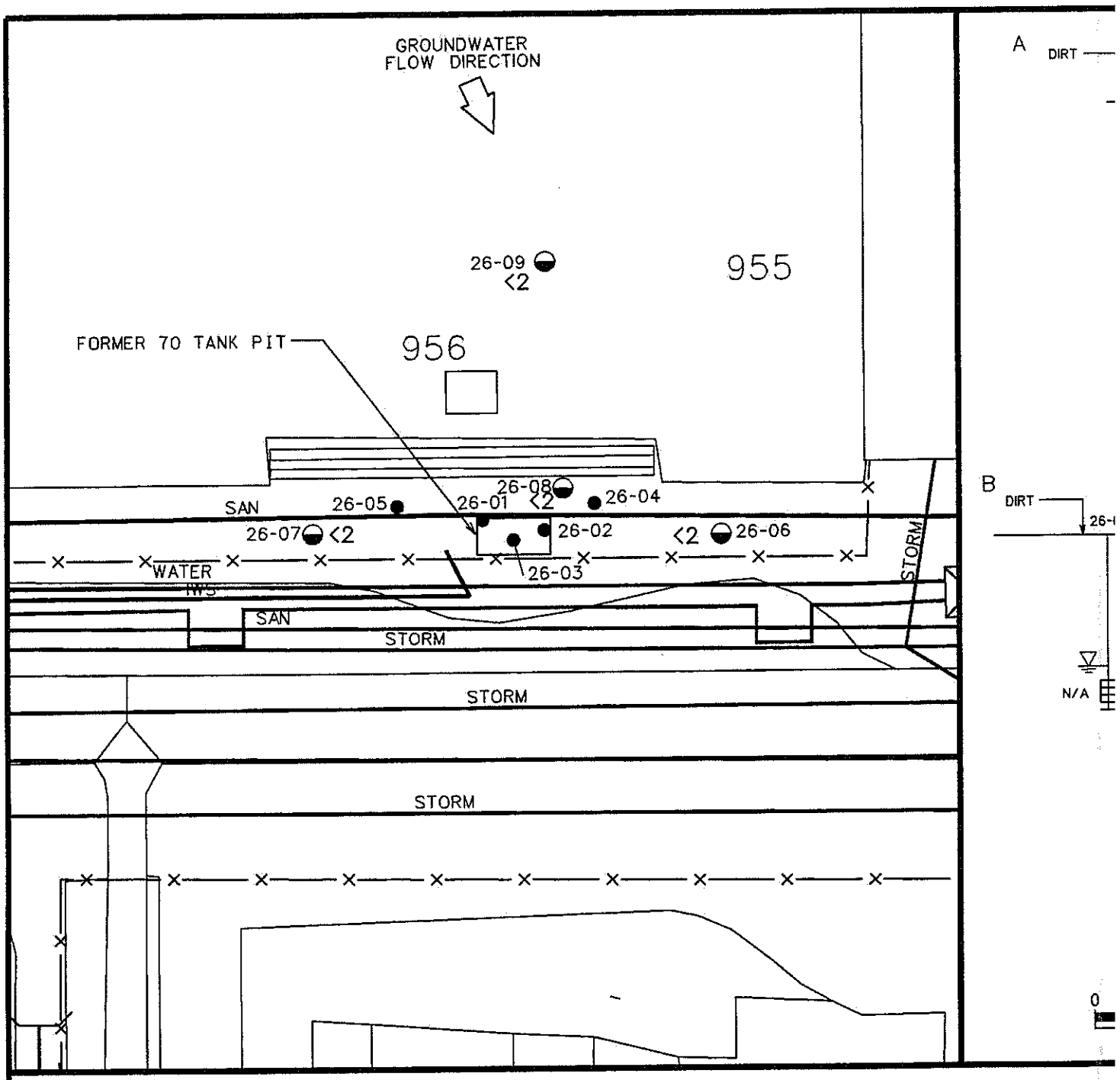

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART B SI

MCLs

TOLUENE - 1,000 ug/L

Figu

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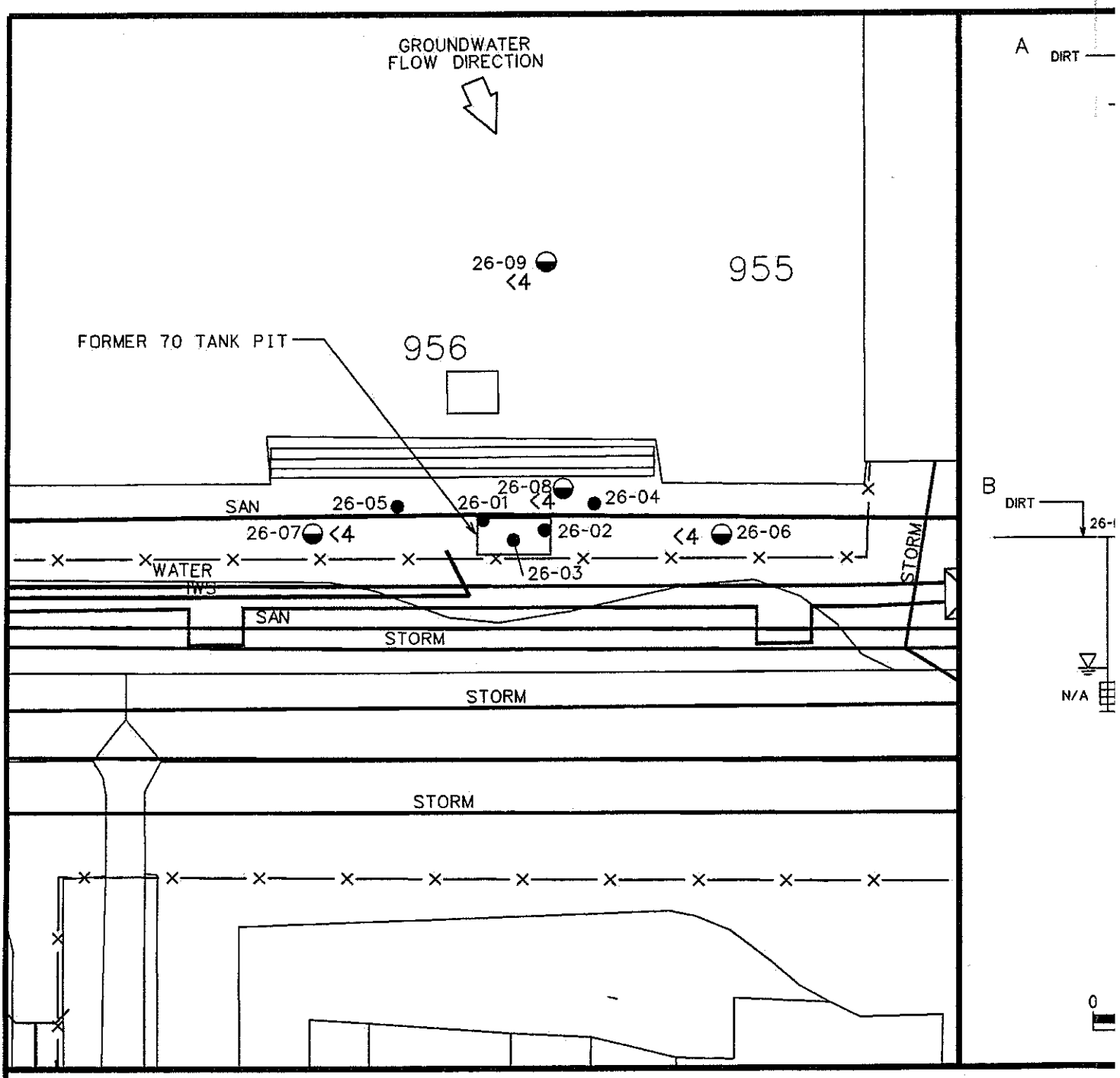

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART B SI

MCLs

TOLUENE - 10,000 ug/L

F

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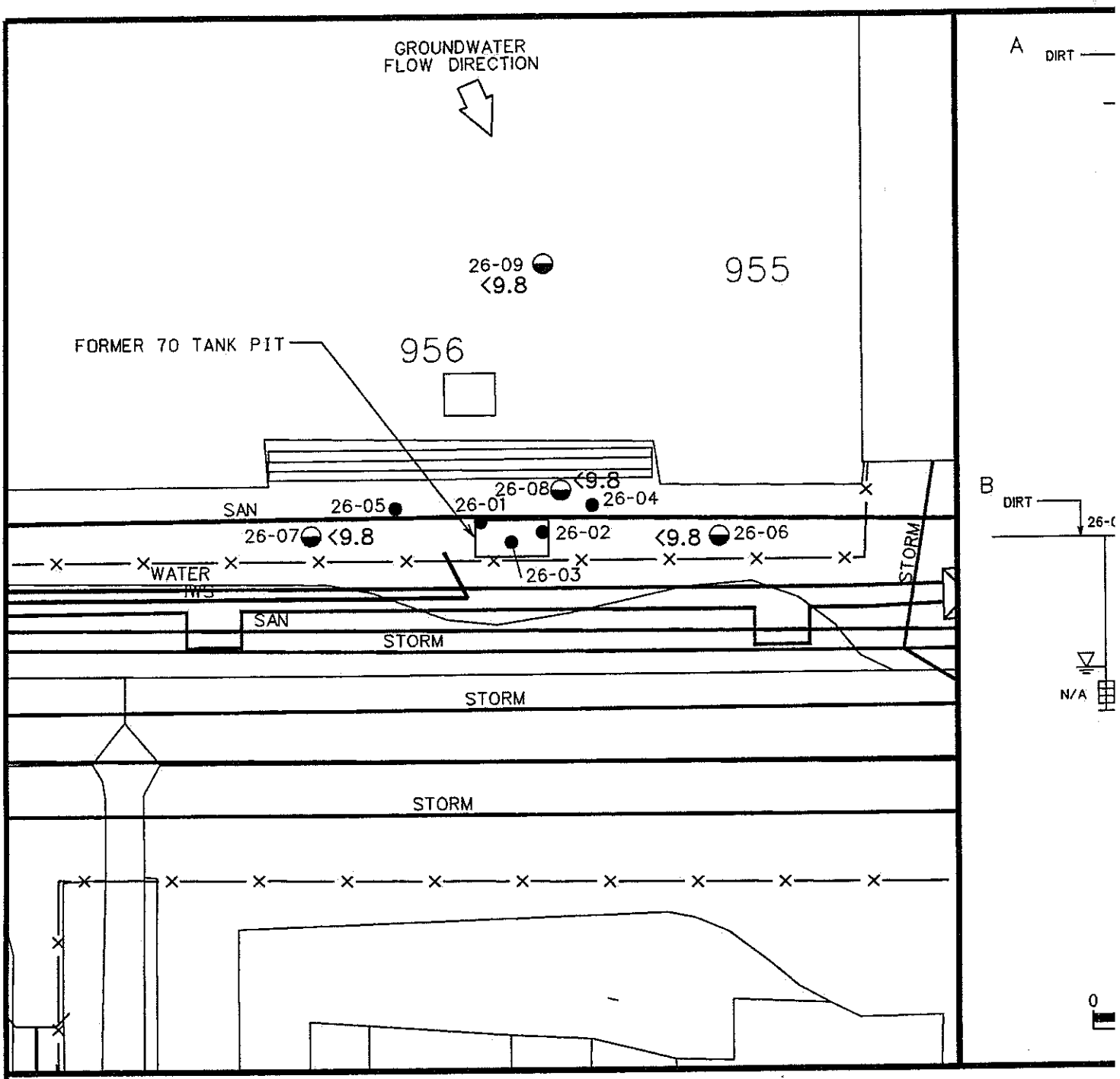

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART B SI

MCLs

NAPHTHALENE - NONE

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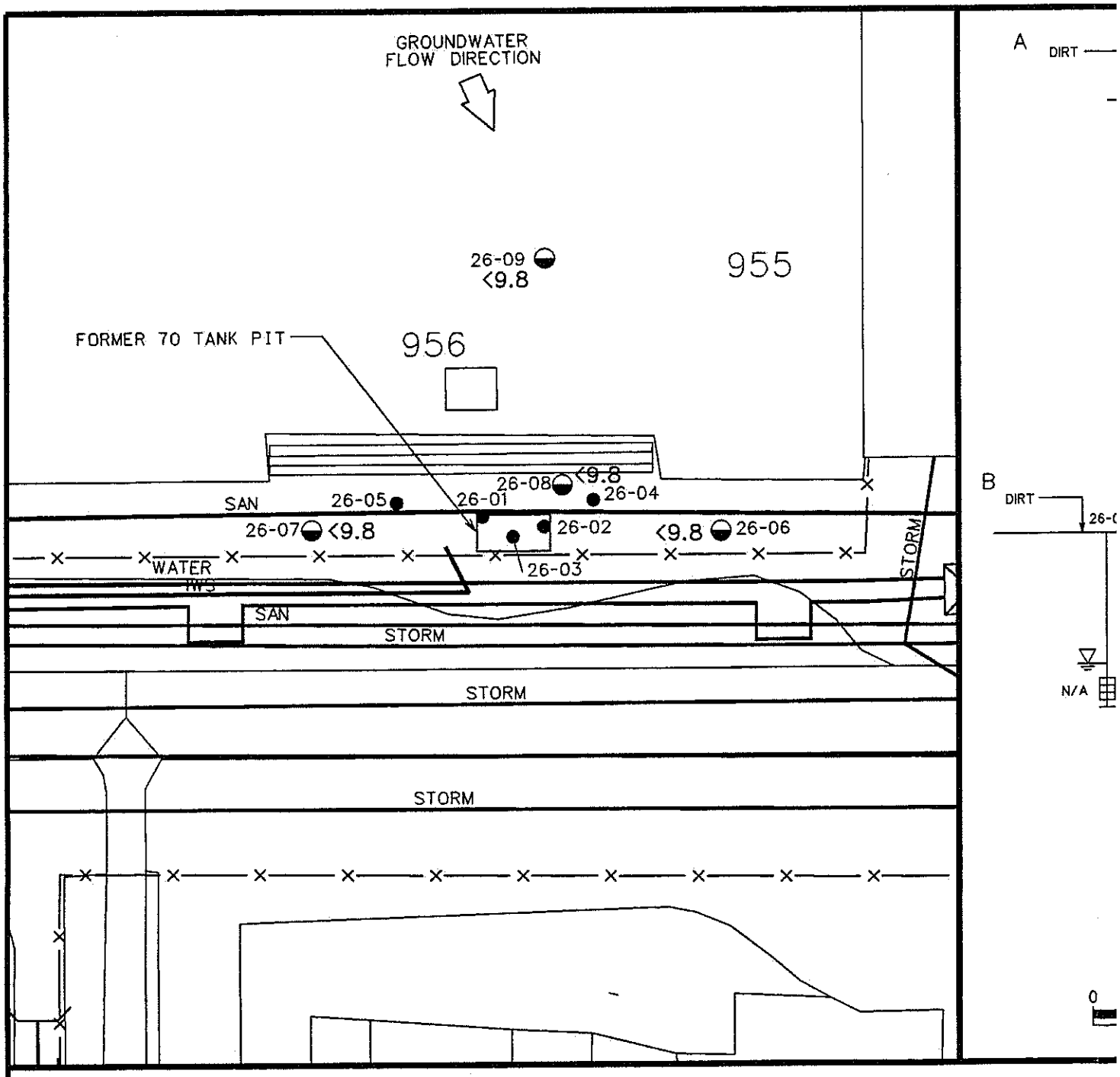

LEGEND

- CAP PART A SOIL BORING
- CAP PART B MONITORING WELL
- CAP PART B SOIL BORING
- SCREENED GROUNDWATER SAMPLE INTERVAL AND SAMPLE ID
- GROUNDWATER SAMPLE INTERVAL WITH CONTAMINATION
- GROUNDWATER CONTAMINATION EXCEEDING MCLS
- APPROXIMATE WATER LEVEL
- N/A NOT APPLICABLE, LOCATION WAS NOT SAMPLED DURING CAP PART B SI

MCLs

PHENANTHRENE - NONE

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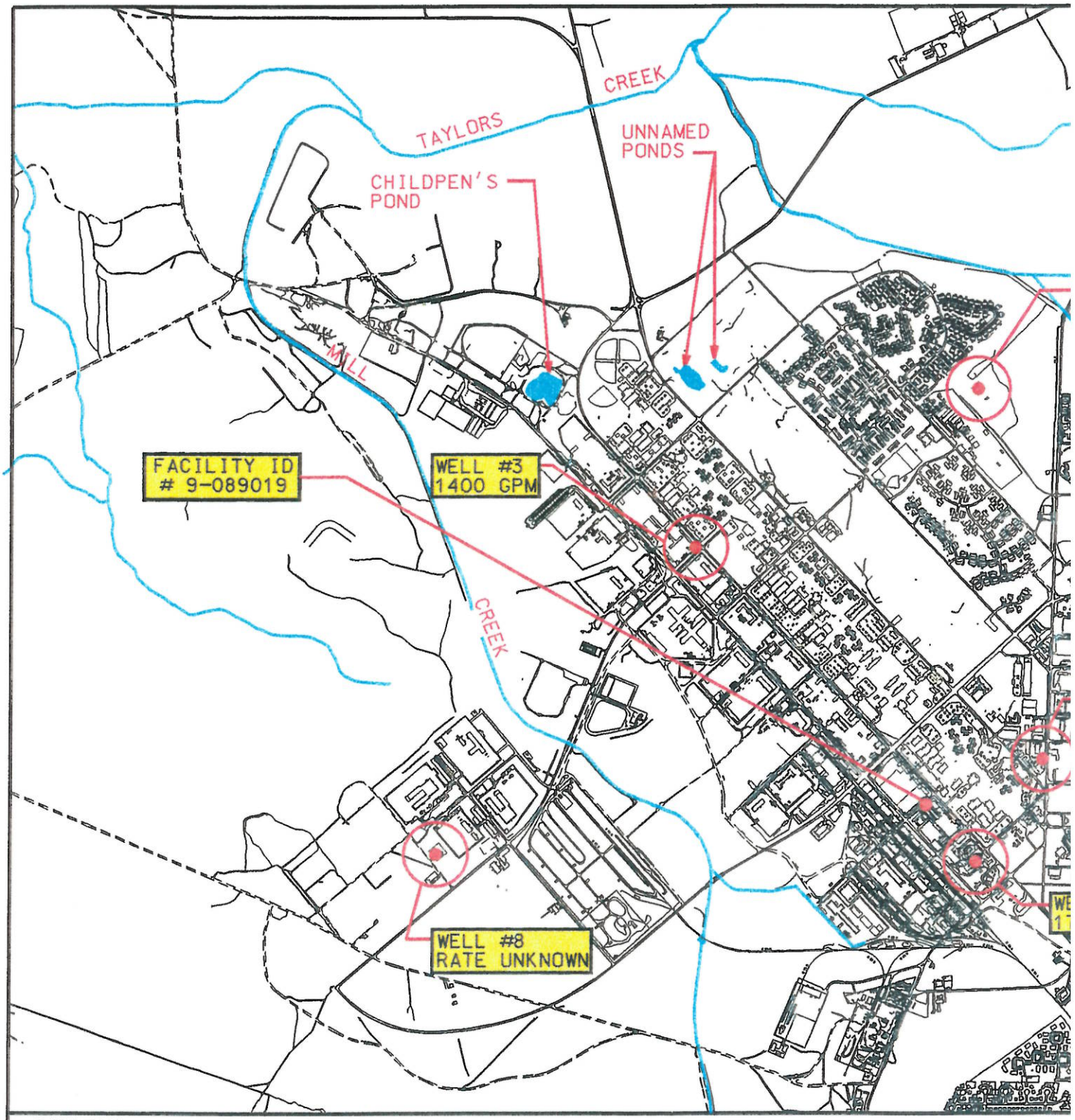
TAYLORS
CREEK
UNNAMED
PONDS
CHILDPEN'S
POND
MILL
FACILITY ID
9-089019
WELL #3
1400 GPM
CREEK
WELL #8
RATE UNKNOWN
LEGEND
CREEK
POND
500' RADIUS
GPM = GALLONS PER MINUTE

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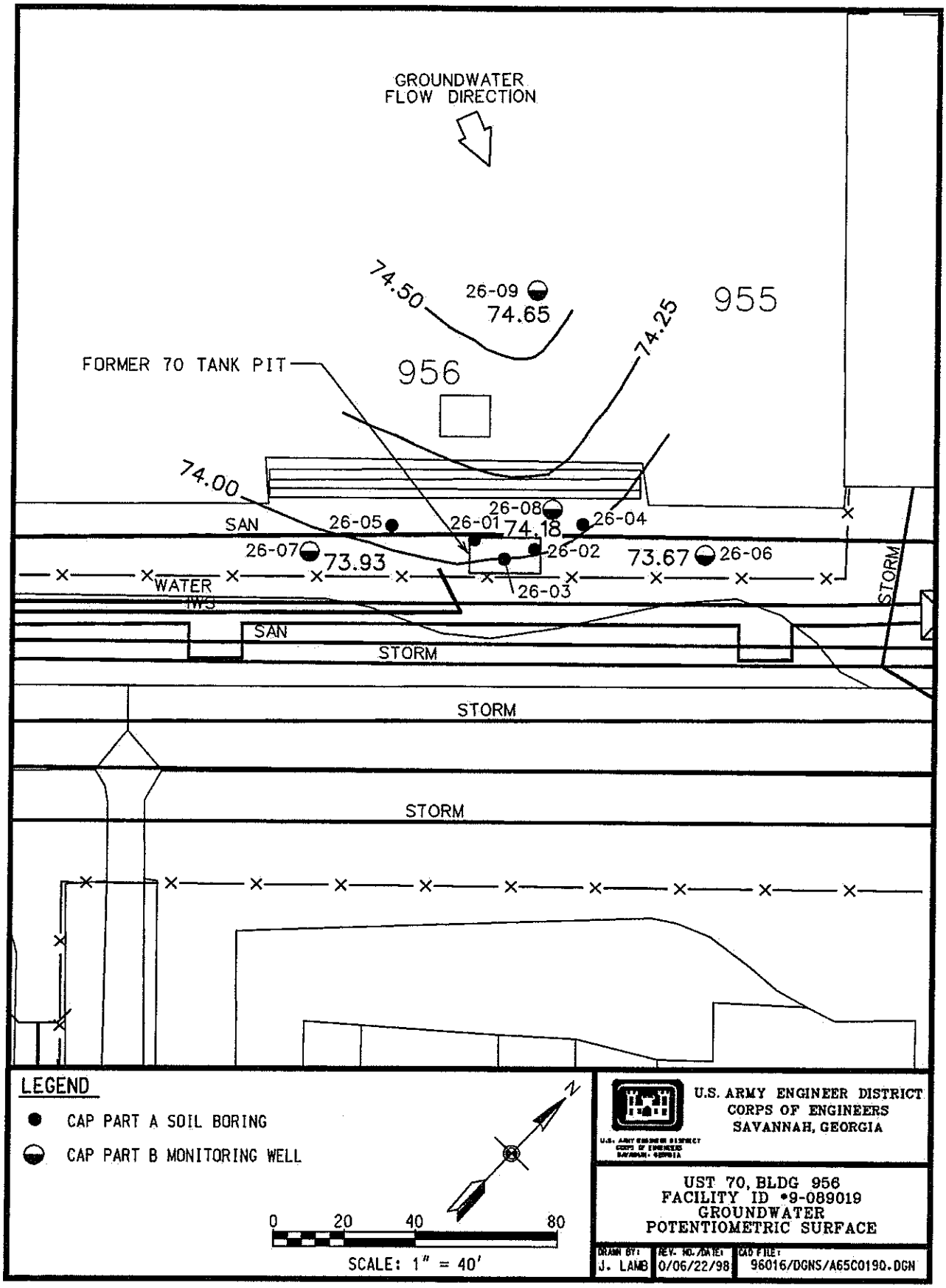

Figure II-18. Groundwater Potentiometric Surface Map for the UST 70 Site, Facility ID #9-089019

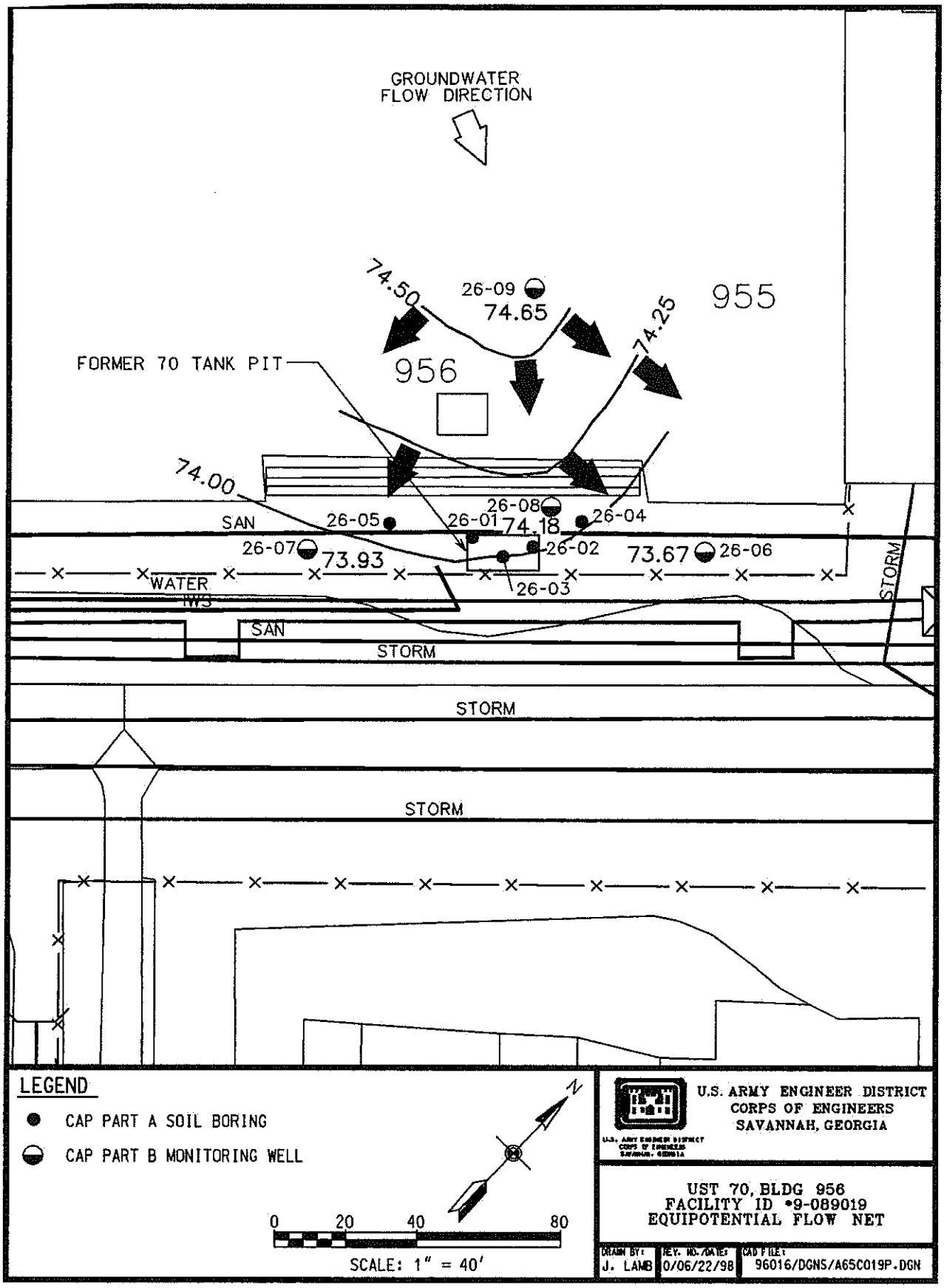

Figure II-19. Equipotential Flow Net for the UST 70 Site, Facility ID #9-089019

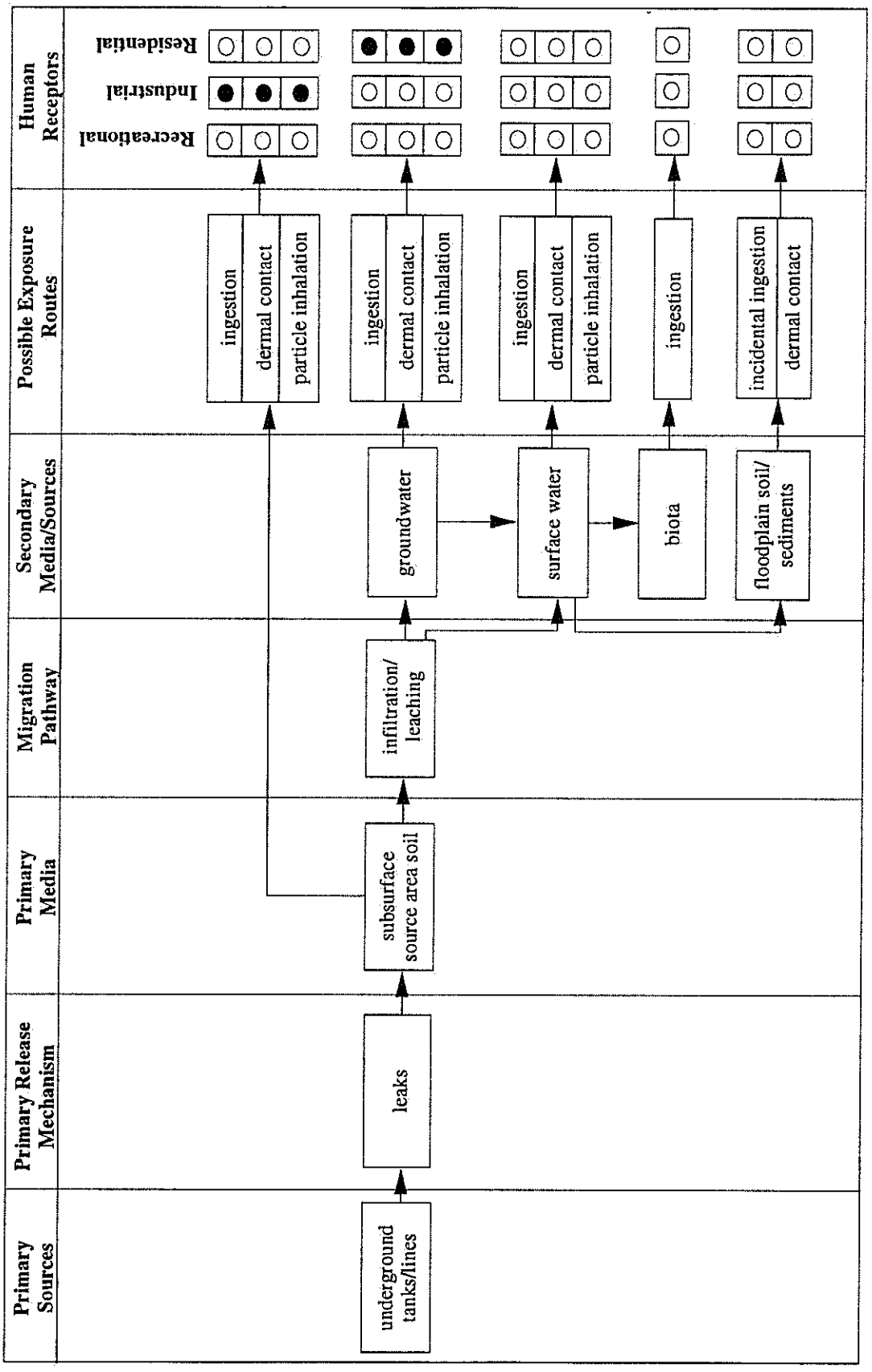

Figure III-1. Conceptual Exposure Model for the UST 70 Site, Facility ID #9-089019

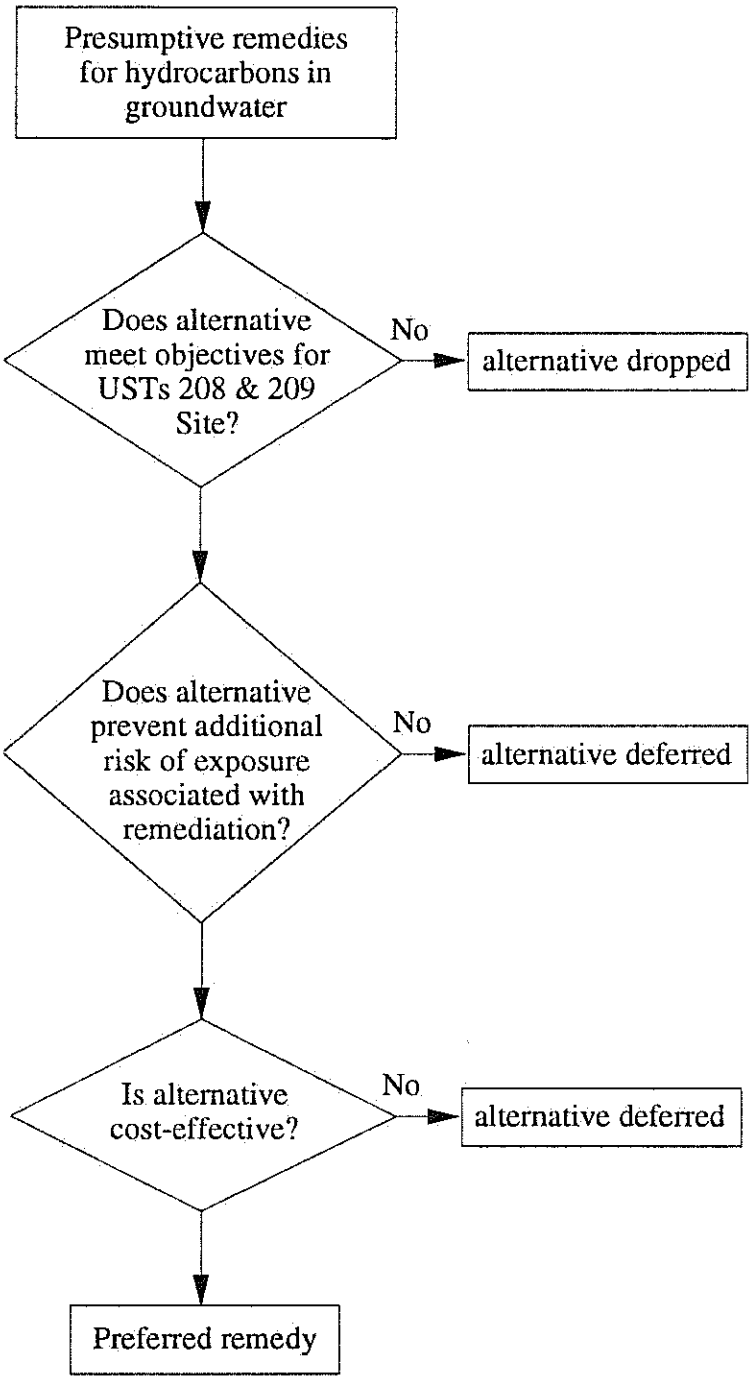

Figure III-2. Remedial Alternatives Selection Process for the UST 70 Site, Facility ID #9-089019

APPENDIX A

SITE INVESTIGATION LABORATORY ANALYTICAL RESULTS

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GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

STATEMENT ON LABORATORY DETECTION LIMITS

General Engineering has been performing chemical analysis on soil and groundwater samples for SAIC managed Ft. Stewart, GA, UST CAP Part-A and CAP Part-B Investigations for the past two years.

In the course of these studies GEL has employed appropriate EPA SW-846 protocols according to Methods 8020 for BTEX compounds, 8270 for PAH compounds, and modified 8015 for TPH-GRO and TPH-DRO components.

In performance of these methods the laboratory has consistently maintained analyte reporting levels of:

Analyte	Soil ug/Kg	Water ug/L
Benzene	5	5
Toluene	5	5
Ethylbenzene	5	5
Xylenes	10	10
PAHs	330	10
	mg/Kg	mg/L
TPH-GRO	5	0.1
TPH-DRO	4	0.1
TPH	10	0.2

Analytical method detection levels (MDLs) have been maintained at the following levels:

Analyte	Soil ug/Kg	Water ug/L
Benzene	2	2
Toluene	2	2
Ethylbenzene	2	2
Xylenes	4	4
PAHs	70	2
	mg/Kg	mg/L
TPH-GRO	2	0.05
TPH-DRO	2	0.05
TPH	4	0.1

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(803) 556-81 8031 766-1178

When an analyte was observed between the laboratory MDL and the reporting level, an estimated ("J") value was reported. If an analyte is not determined above the MDL, the laboratory will report the reporting level as a "U" (undetected). The above reporting levels and MDLs are applicable for all values reported for these analyses. For example, when a Benzene concentration of 500 ug/Kg is reported the associated reporting level is 5 ug/Kg and the associated MDL is 2 ug/Kg.

Soil data has been reported on a dry weight basis. This introduces a correction factor based on the moisture content found in each sample for both positive values and for the reporting level and MDL. For example, when a soil sample's reporting level is corrected for its percent moisture (say 10% moisture), the dry weight reporting level for benzene becomes 5.5 ug/gm and the MDL becomes 2.2 ug/gm. Therefore soil reporting levels will vary based on the moisture.

These reporting protocols follow current EPA direction.

GEL attempted in every sample analysis to achieve the requirements of GUST for soil and groundwater analyses. However, in some cases, it was not possible to achieve standard MDLs and reporting levels for each individual analyte. When a single analyte is found in the sample at high concentrations (example: xylenes at 5,000 ug/Kg), the sample must be diluted to properly quantify the level of that analyte. Dilution of the sample for one analyte will dilute the sample for all other analytes, raising the reporting levels for those analytes by the multiple of the dilution factor (example: a dilution of 1:10 will raise reporting levels of benzene to 50 ug/Kg). At other times concentrations of undetermined contaminants will require samples to be diluted, causing reporting levels and MDLs to become elevated.

The data produced for these Ft. Stewart UST Investigations was determined using approved EPA methodology by qualified analytical chemists. It has been reviewed by the laboratory and is considered technically sound and defensible.

Name: Robert L. Pullano Title: Quality Systems Manager

Signature: Robert L. Pullano Date: 14 April 98

GENERAL ENGINEERING LABORATORIES
PO Box 30712 - Charleston, SC 29417 • 2040 Savage Road • 29407
(803) 556-8171 • Fax (803) 766-1178

ANALYTICAL DATA

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FORM 1 Science Applications07-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

260611

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2004S

Matrix: (soil/water) SOIL Lab Sample ID: 9711210-01

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2J206

Level: (low/med) LOW DATA VALIDATION COPY Date Received: 11/07/97

% Moisture: not dec. 14 Date Analyzed: 11/18/97

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

U

LB

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260611

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2004S

Matrix: (soil/water) SOIL Lab Sample ID: 9711210-01

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2W107

DATA VALIDATION COPY

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 14 decanted: (Y/N) N Date Extracted: 11/18/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/97

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	388	U
91-58-7	2-chloronaphthalene	388	U
209-96-8	acenaphthylene	388	U
83-32-9	acenaphthene	388	U
86-73-7	fluorene	388	U
85-01-8	phenanthrene	388	U
120-12-7	anthracene	388	U
206-44-0	fluoranthene	388	U
129-00-0	pyrene	388	U
56-55-3	benzo(a)anthracene	388	U
218-01-9	chrysene	388	U
205-99-2	benzo(b)fluoranthene	388	U
207-08-9	benzo(k)fluoranthene	388	U
50-32-8	benzo(a)pyrene	388	U
193-39-5	indeno(1,2,3-cd)pyrene	388	U
53-70-3	dibenz(a,h)anthracene	388	U
191-24-2	benzo(g,h,i)perylene	388	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 01, 1997

Sample ID : 260611
Lab ID : 9711210-01
Matrix : Soil
Date Collected : 11/06/97
Date Received : 11/07/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
Evaporative Loss @ 105 C		14.0	1.00	1.00	wt%	1.0	ERH	11/17/97	1600	111111	1
General Chemistry											
TOTAL REC. PETRO. HYDROCARBONS	217	=	2.30	11.6	mg/kg	1.0	TSM	11/19/97	1500	111526	2
The following prep procedures were performed:											
GC/MS Base/Neutral Compounds							GWL	11/18/97	2345	111435	1

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	95.0	(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 Applications07-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

260613

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2004S

Matrix: (soil/water) SOIL Lab Sample ID: 9711210-02

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2J209

Level: (low/med) LOW DATA VALI.. ..JN Date Received: 11/07/97

% Moisture: not dec. 13 COPY Date Analyzed: 11/18/97

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	U
108-88-3	Toluene	2.3	U	
100-41-4	Ethylbenzene	2.3	U	
1330-20-7	Xylenes (total)	4.6	U	

FORM I VOA

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260613

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2004S

Matrix: (soil/water) SOIL Lab Sample ID: 97i1210-02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2W1C8

Level: (low/med) LOW DATA VALIDATION COPY Date Received: 11/07/97

% Moisture: 13 decanted: (Y/N) N Date Extracted: 11/18/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/97

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	383	U
91-58-7	2-chloronaphthalene	383	U
209-96-8	acenaphthylene	383	U
83-32-9	acenaphthene	383	U
86-73-7	fluorene	383	U
85-01-8	phenanthrene	383	U
120-12-7	anthracene	383	U
206-44-0	fluoranthene	383	U
129-00-0	pyrene	383	U
56-55-3	benzo(a)anthracene	383	U
218-01-9	chrysene	383	U
205-99-2	benzo(b)fluoranthene	383	U
207-08-9	benzo(k)fluoranthene	383	U
50-32-8	benzo(a)pyrene	383	U
193-39-5	indeno(1,2,3-cd)pyrene	383	U
53-70-3	dibenz(a,h)anthracene	383	U
191-24-2	benzo(g,h,i)perylene	383	U

U

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)

DATA VALIDATION COPY

cc: SAIC01097

Report Date: December 01, 1997

Sample ID	: 260613
Lab ID	: 971210-02
Matrix	: Soil
Date Collected	: 11/06/97
Date Received	: 11/07/97
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	11/17/97	1600	111111	1
General Chemistry											
TOTAL REC. PETRO. HYDROCARBONS		55.9	2.28	11.5	mg/kg	1.0	TSM	11/19/97	1500	111526	2
The following prep procedures were performed:											
GC/MS Base/Neutral Compounds							GWL	11/18/97	2345	111435	1

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	95.0	(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'.

FORM 1 Science Applications07-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

260621

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2004S

Matrix: (soil/water) SOIL Lab Sample ID: 9711210-03

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2J2010

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: not dec. 15 Date Analyzed: 11/18/97

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

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
71-43-2	Benzene	2.4	U
108-88-3	Toluene	2.4	U
100-41-4	Ethylbenzene	2.4	U
1330-20-7	Xylenes (total)	4.7	U

U

FORM I VOA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260621

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2004S

Matrix: (soil/water) SOIL Lab Sample ID: 9711210-03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2W109

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 15 decanted: (Y/N) N Date Extracted: 11/18/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/01/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

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

DATA VALIDATION COPY

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	naphthalene	392	U
91-58-7	2-chloronaphthalene	392	U
209-96-8	acenaphthylene	392	U
83-32-9	acenaphthene	392	U
86-73-7	fluorene	392	U
85-01-8	phenanthrene	392	U
120-12-7	anthracene	392	U
206-44-0	fluoranthene	392	U
129-00-0	pyrene	392	U
56-55-3	benzo(a)anthracene	392	U
218-01-9	chrysene	392	U
205-99-2	benzo(b)fluoranthene	392	U
207-08-9	benzo(k)fluoranthene	392	U
50-32-8	benzo(a)pyrene	392	U
193-39-5	indeno(1,2,3-cd)pyrene	392	U
53-70-3	dibenz(a,h)anthracene	392	U
191-24-2	benzo(g,h,i)perylene	392	U

U

FORM I SV-1 OLM03.

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

260621

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2004
Matrix (soil/water): SOIL_ Lab Sample ID: 9711210-03
Level (low/med): LOW__ Date Received: 11/07/97
% Solids: _85.0

DATA VALIDATION COPY

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	3.0			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 01, 1997

Sample ID	: 260621
Lab ID	: 9711210-03
Matrix	: Soil
Date Collected	: 11/06/97
Date Received	: 11/07/97
Priority	: Routine
Collector	: Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		15.0		1.00	1.00	wt%	1.0	ERH	11/17/97	1600	111111	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		2.66	UF01, F06	2.34	11.8	mg/kg	1.0	TSM	11/19/97	1500	111526	2
TOTAL ORGANIC CARBON (TOC)		10600	=	24.1	100	mg/kg	1.0	LS	11/29/97	1342	112099	3

The following prep procedures were performed:

GC/MS Base/Neutral Compounds								GWL	11/18/97	2345	111435	1
TRACE								FGD	11/22/97	1500	111344	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	112.	(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

9711210-03

FORM 1 Science Applications07-NOV 1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

260711

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-08

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2017

Level: (low/med) LOW Date Received: 11/07/97

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

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	J
108-88-3	Toluene	2.2	U
100-41-4	Ethylbenzene	2.2	U
1330-20-7	Xylenes (total)	4.5	U

U

DATA VALIDATION

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260711

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-08

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2W214

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 11 decanted: (Y/N) N Date Extracted: 11/17/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/97

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	370	U
91-58-7	2-chloronaphthalene	370	U
209-96-8	acenaphthylene	370	U
83-32-9	acenaphthene	370	U
86-73-7	fluorene	370	U
85-01-8	phenanthrene	370	U
120-12-7	anthracene	370	U
206-44-0	fluoranthene	370	U
129-00-0	pyrene	370	U
56-55-3	benzo(a)anthracene	370	U
218-01-9	chrysene	370	U
205-99-2	benzo(b)fluoranthene	370	U
207-08-9	benzo(k)fluoranthene	370	U
50-32-8	benzo(a)pyrene	370	U
193-39-5	indeno(1,2,3-cd)pyrene	370	U
53-70-3	dibenz(a,h)anthracene	370	U
191-24-2	benzo(g,h,i)perylene	370	U

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 02, 1997

Sample ID : 260711
Lab ID : 9711208-08
Matrix : Soil
Date Collected : 11/05/97
Date Received : 11/07/97
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	11/17/97	1600	111111	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		14.6	=	2.22	11.2	mg/kg	1.0	TSM	11/19/97	1500	111526	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	103.	(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'.

DATA VALIDATION COPY

9711208-08

FORM 1 Science Applications07-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

260721

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-09

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2020

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: not dec. 20 Date Analyzed: 11/13/97

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	2.5	U
108-88-3	Toluene	2.5	U
100-41-4	Ethylbenzene	2.5	U
1330-20-7	Xylenes (total)	5.0	U

U

DATA VALIDATION

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260721

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-09

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2W215

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 20 decanted: (Y/N) N Date Extracted: 11/17/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/97

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	417	U
91-58-7	2-chloronaphthalene	417	U
209-96-8	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

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

260721

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2003
Matrix (soil/water): SOIL_ Lab Sample ID: 9711208-09
Level (low/med): LOW__ Date Received: 11/07/97
% Solids: _80.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	6.4			P

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. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 02, 1997

Sample ID : 260721
Lab ID : 9711208-09
Matrix : Soil
Date Collected : 11/05/97
Date Received : 11/07/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		20.0		1.00	1.00	wt%	1.0	ERH	11/17/97	1600	111111	1
General Chemistry	J											
TOTAL REC. PETRO. HYDROCARBONS		4.01	U F01,F06	2.48	12.5	mg/kg	1.0	TSM	11/19/97	1500	111526	2
TOTAL ORGANIC CARBON (TOC)		15200	=	24.1	100	mg/kg	1.0	LS	11/29/97	1311	112099	3

The following prep procedures were performed:
TRACE FGD 11/17/97 2200 110983 4

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	105.	(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

DATA VALIDATION COPY

9711208-09

FORM 1 Science Applications07-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

260811

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2012

Level: (low/med) LOW Date Received: 11/07/97

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

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	2.7	U
108-88-3	Toluene	2.7	U
100-41-4	Ethylbenzene	2.7	U
1330-20-7	Xylenes (total)	5.4	U

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260811

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2W216

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 26 decanted: (Y/N) N Date Extracted: 11/17/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/97

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	450	U
91-58-7	2-chloronaphthalene	450	U
209-96-8	acenaphthylene	450	U
83-32-9	acenaphthene	450	U
86-73-7	fluorene	450	U
85-01-8	phenanthrene	450	U
120-12-7	anthracene	450	U
206-44-0	fluoranthene	450	U
129-00-0	pyrene	450	U
56-55-3	benzo(a)anthracene	450	U
218-01-9	chrysene	450	U
205-99-2	benzo(b)fluoranthene	450	U
207-08-9	benzo(k)fluoranthene	450	U
50-32-8	benzo(a)pyrene	450	U
193-39-5	indeno(1,2,3-cd)pyrene	450	U
53-70-3	dibenz(a,h)anthracene	450	U
191-24-2	benzo(g,h,i)perylene	450	U

U

FORM I SV-1 OLM03.0

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 01, 1997

Sample ID : 260811
Lab ID : 9711208-11
Matrix : Soil
Date Collected : 11/05/97
Date Received : 11/07/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep											
Evaporative Loss @ 105 C		26.0	1.00	1.00	wt%	1.0	ERH	11/17/97	1600	111111	1
General Chemistry											
TOTAL REC. PETRO. HYDROCARBONS	J	6.16	2.67	13.5	mg/kg	1.0	TSM	11/19/97	1500	111526	2

UFD1, FD6

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	115.	(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'.

DATA VALIDATION COPY

26

VOLATILE ORGANICS ANALYSIS DATA SHEET

260821

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-12

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2022

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: not dec. 24 Date Analyzed: 11/13/97

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	2.6	U
108-88-3	Toluene	2.6	U
100-41-4	Ethylbenzene	2.6	U
1330-20-7	Xylenes (total)	5.3	U

U

DATA VALIDATION COPY

3

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260521

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: PSE003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711205-12

Sample wt/vol: 30.9 (g/mL) G Lab File ID: 2W217

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 24 decanted: (Y/N) N Date Extracted: 11/17/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/97

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	426	U
91-58-7	2-chloronaphthalene	426	U
209-96-8	acenaphthylene	426	U
83-32-9	acenaphthene	426	U
86-73-7	fluorene	426	U
85-01-8	phenanthrene	426	U
120-12-7	anthracene	426	U
206-44-0	fluoranthene	426	U
129-00-0	pyrene	426	U
56-55-3	benzo(a)anthracene	426	U
218-01-9	chrysene	426	U
205-99-2	benzo(b)fluoranthene	426	U
207-08-9	benzo(k)fluoranthene	426	U
50-32-8	benzo(a)pyrene	426	U
193-39-5	indeno(1,2,3-cd)pyrene	426	U
53-70-3	dibenz(a,h)anthracene	426	U
191-24-2	benzo(g,h,i)perylene	426	U

FORM I SV-1 OLM03

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

260821

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2003
Matrix (soil/water): SOIL_ Lab Sample ID: 9711208-12
Level (low/med): LOW__ Date Received: 11/07/97
% Solids: _76.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7439-92-1	Lead	2.6			P	

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. Kristi Anderson
Project Description: Option 1 to CAP-Part B (UST Sites)

cc: SAIC01097 Report Date: December 01, 1997

Sample ID : 260821
Lab ID : 9711208-12
Matrix : Soil
Date Collected : 11/05/97
Date Received : 11/07/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		24.0		1.00	1.00	wt%	1.0	ERH	11/17/97	1600	111111	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS	J	6.76	U FD1, FD2	2.61	13.2	mg/kg	1.0	TSM	11/19/97	1500	111526	2
TOTAL ORGANIC CARBON (TOC)		6810	=	24.1	100	mg/kg	1.0	LS	11/29/97	1325	112099	3

The following prep procedures were performed:

TRACE								FGD	11/17/97	2200	110983	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	116.	(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

DATA VALIDATION COPY

VOLATILE ORGANICS ANALYSIS DATA SHEET

260911

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-01

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2011

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: not dec. 12 Date Analyzed: 11/12/97

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)	4.5	U

U

DATA VALIDATION

3

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260911

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-01

Sample wt/vol: 30.3 (g/mL) G Lab File ID: 2W207

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 12 decanted: (Y/N) N Date Extracted: 11/17/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/97

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	375	U
91-58-7	2-chloronaphthalene	375	U
209-96-8	acenaphthylene	375	U
83-32-9	acenaphthene	375	U
86-73-7	fluorene	375	U
85-01-8	phenanthrene	375	U
120-12-7	anthracene	375	U
206-44-0	fluoranthene	375	U
129-00-0	pyrene	375	U
56-55-3	benzo(a)anthracene	375	U
218-01-9	chrysene	375	U
205-99-2	benzo(b)fluoranthene	375	U
207-08-9	benzo(k)fluoranthene	375	U
50-32-8	benzo(a)pyrene	375	U
193-39-5	indeno(1,2,3-cd)pyrene	375	U
53-70-3	dibenz(a,h)anthracene	375	U
191-24-2	benzo(g,h,i)perylene	375	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

260921

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-02

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 2I2014

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: not dec. 3 Date Analyzed: 11/13/97

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)	4.1	U

U

DATA VALIDATION COPY

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

260921

Lab Name: GENERAL ENGINEERING LABO Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) SOIL Lab Sample ID: 9711208-02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 2W299

Level: (low/med) LOW Date Received: 11/07/97

% Moisture: 3 decanted: (Y/N) N Date Extracted: 11/17/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/97

Injection Volume: 1.0(uL) Dilution Factor: 40.0

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	13700	U
91-58-7	2-chloronaphthalene	13700	U
208-96-8	acenaphthylene	13700	U
83-32-9	acenaphthene	13700	U
86-73-7	fluorene	13700	U
85-01-8	phenanthrene	13700	U
120-12-7	anthracene	13700	U
206-44-0	fluoranthene	13700	U
129-00-0	pyrene	13700	U
56-55-3	benzo(a)anthracene	13700	U
218-01-9	chrysene	13700	U
205-99-2	benzo(b)fluoranthene	13700	U
207-08-9	benzo(k)fluoranthene	13700	U
50-32-8	benzo(a)pyrene	13700	U
193-39-5	indeno(1,2,3-cd)pyrene	13700	U
53-70-3	dibenz(a,h)anthracene	13700	U
191-24-2	benzo(g,h,i)perylene	13700	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

260921

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2003
Matrix (soil/water): SOIL_ Lab Sample ID: 9711208-02
Level (low/med): LOW__ Date Received: 11/07/97
% Solids: 97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	16.9			P

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

Comments:

DATA VALIDATION

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 01, 1997

Sample ID : 260921
Lab ID : 9711208-02
Matrix : Soil
Date Collected : 11/05/97
Date Received : 11/07/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Organic Prep												
Evaporative Loss @ 105 C		3.00		1.00	1.00	wt%	1.0	ERH	11/17/97	1600	111111	1
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS	666		=	10.2	51.5	mg/kg	5.0	TSM	11/19/97	1500	111526	2
TOTAL ORGANIC CARBON (TOC)	3420		=	24.1	100	mg/kg	1.0	LS	11/29/97	1209	112099	3
The following prep procedures were performed:												
TRACE								FGD	11/17/97	2200	110983	4

Surrogate Recovery	Test	Percent%	Acceptable Limits
n-propylbenzene	BTEX-GC	71.0	(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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FORM 1 VOLATILE ORGANICS ANALYSIS DATA SHEET

Science Applications17-DEC [illegible] SA

2606W2

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: 9712480-01

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 20607

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

% Moisture: not dec. _____ Date Analyzed: 12/27/97

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

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
2606W2

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: 9712480-01

Sample wt/vol: 1020 (g/mL) ML Lab File ID: 8A508

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

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/19/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/02/98

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	9.8	U
91-58-7	2-chloronaphthalene	9.8	U
208-96-8	acenaphthylene	9.8	U
83-32-9	acenaphthene	9.8	U
86-73-7	fluorene	9.8	U
85-01-8	phenanthrene	9.8	U
120-12-7	anthracene	9.8	U
206-44-0	fluoranthene	9.8	U
129-00-0	pyrene	9.8	U
56-55-3	benzo(a)anthracene	9.8	U
218-01-9	chrysene	9.8	U
205-99-2	benzo(b)fluoranthene	9.8	U
207-08-9	benzo(k)fluoranthene	9.8	U
50-32-8	benzo(a)pyrene	9.8	U
193-39-5	indeno(1,2,3-cd)pyrene	9.8	U
53-70-3	dibenz(a,h)anthracene	9.8	U
191-24-2	benzo(g,h,i)perylene	9.8	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2606W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2032
Matrix (soil/water): WATER Lab Sample ID: 9712480-01
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	384			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

2607W2

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: 9712480-02

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 206010

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

% Moisture: not dec. _____ Date Analyzed: 12/27/97

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

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

2607W2

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: 9712480-02

Sample wt/vol: 1020 (g/mL) ML Lab File ID: 8A509

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

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/19/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/02/98

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	9.8	U
91-58-7	2-chloronaphthalene	9.8	U
208-96-8	acenaphthylene	9.8	U
83-32-9	acenaphthene	9.8	U
86-73-7	fluorene	9.8	U
85-01-8	phenanthrene	9.8	U
120-12-7	anthracene	9.8	U
206-44-0	fluoranthene	9.8	U
129-00-0	pyrene	9.8	U
56-55-3	benzo(a)anthracene	9.8	U
218-01-9	chrysene	9.8	U
205-99-2	benzo(b)fluoranthene	9.8	U
207-08-9	benzo(k)fluoranthene	9.8	U
50-32-8	benzo(a)pyrene	9.8	U
193-39-5	indeno(1,2,3-cd)pyrene	9.8	U
53-70-3	dibenz(a,h)anthracene	9.8	U
191-24-2	benzo(g,h,i)perylene	9.8	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2607W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_ SDG No.: FS2032

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

Matrix (soil/water): WATER Lab Sample ID: 9712480-02

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	397			P	=

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN ILM02.1

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FORM 1 VOLATILE ORGANICS ANALYSIS DATA SHEET

Science Applications17-DEC-1997 09

2608W2

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: 9712480-03

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 206011

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

% Moisture: not dec. _____ Date Analyzed: 12/27/97

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

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

2608W2

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: 9712480-15

Sample wt/vol: 1010 (g/mL) ML Lab File ID: 8C119

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	9.9	U
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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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2608W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2032
Matrix (soil/water): WATER Lab Sample ID: 9712480-03
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	390			P

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

Comments:

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VOLATILE ORGANICS ANALYSIS DATA SHEET

2608W4

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: 9712480-06

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 206015

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

% Moisture: not dec. _____ Date Analyzed: 12/27/97

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

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

2608W4

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: 9712480-10

Sample wt/vol: 1010 (g/mL) ML Lab File ID: 8C116

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	9.9	U
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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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2608W4

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2032
Matrix (soil/water): WATER Lab Sample ID: 9712480-10
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	412			P

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

Comments:

FORM I - IN ILM02.1

2609W2

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: 9712480-05

Sample wt/vol: 10.0 (g/mL) ML Lab File ID: 206013

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

% Moisture: not dec. _____ Date Analyzed: 12/27/97

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

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

2609W2

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: 9712480-12

Sample wt/vol: 1020 (g/mL) ML Lab File ID: 8A510

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

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/19/97

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 01/02/98

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	9.8	U
91-58-7	2-chloronaphthalene	9.8	U
208-96-8	acenaphthylene	9.8	U
83-32-9	acenaphthene	9.8	U
86-73-7	fluorene	9.8	U
85-01-8	phenanthrene	9.8	U
120-12-7	anthracene	9.8	U
206-44-0	fluoranthene	9.8	U
129-00-0	pyrene	9.8	U
56-55-3	benzo(a)anthracene	9.8	U
218-01-9	chrysene	9.8	U
205-99-2	benzo(b)fluoranthene	9.8	U
207-08-9	benzo(k)fluoranthene	9.8	U
50-32-8	benzo(a)pyrene	9.8	U
193-39-5	indeno(1,2,3-cd)pyrene	9.8	U
53-70-3	dibenz(a,h)anthracene	9.8	U
191-24-2	benzo(g,h,i)perylene	9.8	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2609W2

Lab Name: GENERAL_ENGINEERING_LABS_ Contract: SAIC01097_
Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: FS2032
Matrix (soil/water): WATER Lab Sample ID: 9712480-12
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	479			P

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

Comments:

FORM I - IN ILM02.1

FORM 1 Science Applications07-NOV-1997 SA
VOLATILE ORGANICS ANALYSIS DATA SHEET

2607R5

Lab Name: GENERAL ENGINEERING LABOR Contract: NA

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: FS2003S

Matrix: (soil/water) GROUNDH2O Lab Sample ID: 9711208-10

Sample wt/vol: 10 (g/mL) ML Lab File ID: 2I2013

Level: (low/med) LOW Date Received: 11/07/97

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

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

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 01, 1997

Sample ID : 2607R5
Lab ID : 9711208-10
Matrix : GroundH2O
Date Collected : 11/05/97
Date Received : 11/07/97
Priority : Routine
Collector : Client

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	M
General Chemistry												
TOTAL REC. PETRO. HYDROCARBONS		~~0.460~~ 0.460	=	0.197	0.500	mg/l	1.0	TSM	11/10/97	1100	110999	1
SRR 3/5/98												
The following prep procedures were performed:												
GC/MS Base/Neutral Compounds								GWL	11/11/97	2120	111130	2

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610-SAIC	78.5	(43.0 - 108.)
Nitrobenzene-d5	M610-SAIC	83.2	(35.0 - 111.)
p-Terphenyl-d14	M610-SAIC	107.	(33.0 - 125.)
n-propylbenzene	BTEX-GC	106.	(86.5 - 127.)

M = Method	Method-Description
M 1	EPA 418.1
M 2	EPA 3510

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.

9711208-10

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CHAIN OF CUSTODY FORMS

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Science Applications International Corporation
[illegible] Oak Ridge Turnpike, Oak Ridge, TN 37831 (423) 481-4800

9711208

FS20035
29917

VSI

CHAIN OF CUSTODY RECORD

COC NO.: PB11001

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

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

*PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC ~~29417~~ 29407

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	TPH	TOC	No. of Bottles/ Vials	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
260911	11-05-97	1345	soil	X		X								2	
260921	11-05-97	1315	soil	X		X					X	X	X	2	
151311	11-05-97	1540	soil		X		X							2	
151321	11-05-97	1530	soil		X			X						2	
151411	11-05-97	1100	soil		X		X							2	
151413	11-05-97	1100	soil		X		X							2	
151421	11-05-97	1115	soil		X			X						2	
260711	11-05-97	1400	soil	X		X						X		2	
260721	11-05-97	1415	soil	X		X					X	X	X	2	
260785	11-05-97	1430	Rinsate Water	X		X						X		5	from spoon used on 26-07
260811	11-05-97	1600	soil	X		X						X		2	
260821	11-05-97	1700	soil	X		X					X	X	X	2	

RELINQUISHED BY: [signature] Date/Time: 11/7/97 1241 RECEIVED BY: Date/Time:

COMPANY NAME: SAIC COMPANY NAME:

TOTAL NUMBER OF CONTAINERS: Cooler Temperature:

Cooler ID: FEDEX NUMBER:

RECEIVED BY: [signature] Date/Time: 11/7/97 1241 RELINQUISHED BY: Date/Time:

COMPANY NAME: GEN ENG CHAS COMPANY NAME:

RELINQUISHED BY: [signature] Date/Time: 11-7-97 1600 RECEIVED BY: [signature] Date/Time: 11/7/97 1600

COMPANY NAME: GEN ENG CHAS COMPANY NAME: BCL

A-57

FS20045

971210

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

CHAIN OF CUSTODY RECORD

COC NO.: PB11002

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

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

PROJECT MANAGER: Patty Stoll

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

LABORATORY NAME: General Engineering Laboratory

LABORATORY ADDRESS: 2040 Savage Road Charleston, SC 29417 29407

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
260611	11-06-97	1000	soil	X		X						X		2	
260613	11-06-97	1000	soil	X		X						X		2	
260621	11-06-97	1030	soil	X		X					X	X	X	2	
330911	11-06-97	1200	soil	X		X						X		2	
330921	11-06-97	1145	soil	X		X					X	X	X	2	
330611	11-06-97	1025	soil	X		X						X		2	
330621	11-06-97	1010	soil	X		X					X	X	X	2	
031011	11-06-97	1315	soil	X	X	X			X		X			2	
031021	11-06-97	1330	soil	X	X			X						2	
330711	11/06/97	1425	soil	X		X						X		2	
330721	11/06/97	1410	soil	X		X					X	X	X	2	

REQUESTED PARAMETERS

RELINQUISHED BY:	Date/Time	RECEIVED BY:	Date/Time	TOTAL NUMBER OF CONTAINERS:	Cooler Temperature:
[signature]	11/7/97 1241			Cooler ID:	FEDEX NUMBER:
COMPANY NAME: SAIC		COMPANY NAME:			
RECEIVED BY: [signature]	Date/Time 11/7/97 1241	RELINQUISHED BY:	Date/Time		
COMPANY NAME: GENERAL ENG. LAB		COMPANY NAME:			
RELINQUISHED BY: [signature]	Date/Time 11/7/97 1600	RECEIVED BY: [signature]	Date/Time 11/7/97 1620		
COMPANY NAME: GEN ENG LABS		COMPANY NAME: DEL			

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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.: 511 036

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

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

ROJECT MANAGER: Patty Stoll

mpler (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
26Ø9W2	12/15/97	1340		X								2	9712480-05
26Ø8W4	12/15/97	1645		X								2	9712480-06
~~Ø7~~													
32Ø9W2	12/15/97	1615		X								2	9712480-07
1408W2	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:	Date/Time	RECEIVED BY:	Date/Time
Laura Lumley	12/17/97	[signature]	12.17.97
COMPANY NAME: SAIC	1330	COMPANY NAME: GEL	1330
RECEIVED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY: [signature]	Date/Time 12/17/97	RECEIVED BY: [signature]	Date/Time 12-9-97
COMPANY NAME: GEL	1610	COMPANY NAME: FEL	1610

TOTAL NUMBER OF CONTAINERS: 33 12/17/97

Cooler ID: #46 26

Cooler Temperature: 4°C

FEDEX NUMBER:

Temp 5°C

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

CHAIN OF CUSTODY RECORD

COC NO.: S 11 03

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, DRO	PAH	PAH, DRO	PAH, DRO, LEAD, TOC	DRO	DISSOLVED IRON	LEAD	No. of Bottles/ Vials:	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
26ØØ6W4	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
14ØØ6W2	12/15/97	1500				X				X		3	9712480-13
1514W2	12/15/97	1720				X						2	9712480-14
26ØØ6W2	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.A97 1610
COMPANY NAME: SAIC		COMPANY NAME: GEL	

TOTAL NUMBER OF CONTAINERS: 16

Cooler ID: #131

Cooler Temperature: 4°C

FEDEX NUMBER:

Temp 6°C

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APPENDIX B

FIELD BORING LOGS

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PROJECT: Ft. Stewart MST

INSPECTOR: M. Vask

26-01

SHEET 1 of 3

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)
	0.0	Sandstone				
		Silt, grayish brown	0.0 ppm			
	1.0					
	2.0					
	3.0					
		Sandstone				
		Sand, white, fine	0.0 ppm			
	4.0					
	5.0					
	6.0					
		Sand, olive brown, fine	0.0 ppm			
	7.0					
		Sand, black, fine				
	8.0					
	9.0		0.0 ppm			
	10.0					

Piezometer Casing

PROJECT Ft. Stewart UST | INSPECTOR M. Vest | SHEET 2 of 3

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)
	10.0					
	11.0		0.0 ppm			
	12.0	Sand, dark brown, fine				
	13.0					
	14.0		0.0 ppm			
	15.0	Sand, black, fine				
		Sand, dusky red, fine				
	16.0		5.6 ppm			
	17.0				Soil Sample 26-01-H1	
	18.0		15.0 ppm			
	19.0					
	20.0					

Piezometer Casing

Piezometer Screen

26-01

PROJECT	Ft. Stewart UST	INSPECTOR	M. Vest	SHEET	3 of 3

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)
	20.0					Approx.
	21.0		17.0 ppm		Soil Sample 26012	
	21.6					Groundwater Sample 26012 Collected From Piezometer

26-02

PROJECT	Ft. Stewart UST	INSPECTOR	M. Vast	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)
	0.0	Sand & Silt, gray, fine				
	1.0		0.0 ppm			
		Sand & Silt, grayish brown, fine				
	2.0					
	3.0					
			0.0 ppm			
	4.0					Piezometer Casing
	5.0					
			0.0 ppm			
	6.0					
		Rock Zone				
	7.0					
	8.0					
		Sand & Silt, dark gray, fine				
	9.0		0.0 ppm			
	10.0					

26-02

PROJECT	INSPECTOR	SHEET
Ft. Stewart UST	M. Vest	2 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	SECTION SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0					
	11.0	Sand, black, fine	94.0 ppm		Soil Sample 2602E1	
	12.0					
	13.0		121.0 ppm		Soil Sample 2602F1	
	14.0					
	15.0	No Sampling				
	16.0					Piezometer Screen
	17.0					
	18.0					Approx.
	19.0					
	20.0					

Groundwater Sample 2602W2 Collected From

26-03

PROJECT	INSPECTOR	SHEET
Ft. Stewart UST	J. King	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)
	0.0	Clayey Silt, pale brown	0.3 ppm		Soil Sample 260SA1	Piezometer casing
	1.0					
	2.0					
	3.0	No Sample Due To Poor Recovery				
	4.0					
	5.0					
	6.0	Silty Sand, pale brown/black, fine	0.5 ppm		Soil Sample 260SC1	Piezometer Screen
	7.0					
	8.0	No Sample Due To Poor Recovery				
	9.0					Approx.
	10.0					

PROJECT Ft. Stewart UST | INSPECTOR J. King | 26-03 | 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)
	10.0	No Material Collected (Power Punch)				
	11.0					
	12.0					

Groundwater Sample 26038W2

TANK DRILLING LOG

26-04

PROJECT	Ft. Stewart UST	INSPECTOR	J. King	SHEET	1 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	SOIL TO SAMPLE OR PORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.0	Silty Sand, brown/grayish brown, fine to medium	1.4 ppm		Soil Sample 260401	
	1.0					
	2.0					
	3.0		0.0 ppm			
	4.0					Piezometer Casing
	5.0					
	6.0		0.0 ppm			
	7.0					
	8.0		0.0 ppm		Soil Sample 260401	
	9.0					
	10.0					Approx.

TITLE DRILLING LOG

PROJECT	INSPECTOR		SHEET
Ft. Stewart UST	J. Kiss		26-04 2 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GRAB SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0	No Material Collected (Power Punch)				
	11.0					
	12.0					
	13.0					
	14.0					
	15.0					
	16.0					
	17.0					
	18.0					
	18.5					Groundwater Sample 2604W2 Collected From Piezometer

Piezometer Screen

26-05

PROJECT	Ft. Stewart UST	INSPECTOR	J. Kilg	SHEET	1 of 3

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)
	0.0	Silty Sand, pale brown, fine to medium	1.1 ppm		Soil Sample 260S-A1	
	1.0					
	2.0					
	3.0	No Sample Due To Poor Recovery				
	4.0					
	5.0					
	6.0	Silty Sand, pale brown, fine to medium	0.6 ppm		Soil Sample 260S-C1	
	7.0					
	8.0	Silty Sand, black, fine to medium	0.9 ppm			
	9.0					
	10.6					

Piezometer casing

26-05

PROJECT Ft. Stewart UST | INSPECTOR J. Kilg | SHEET 2 of 3

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUTH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10.0	No Sampling				▽ Perched
	11.0					
	12.0					
	13.0					Piezometer casing
	14.0					
	15.0					
	16.0					
	17.0					
	18.0					
	19.0					Piezometer screen
	20.0					

26-05

PROJECT	Ft. Stewart UST	INSPECTOR	J. Hills	SHEET	3 of 3

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)
	20.6					▼ Approx.
	21.0					
	22.0					
	22.5					Groundwater Sample 2605-WS Collected From Piezometer

HTRW DRILLING LOG

HOLE NUMBER 26-06

PROJECT Fort Stewart USTs | INSPECTOR L. Lumley | 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)
	0–3	No Recovery	N/A			
	3–5	Sandy SILT, fine and medium grained, dry, very dark grayish brown (10YR 3/2)	0.0ppm			
	5–7	Shelby Tube		Soil Sample 260631		
	7–8	Sandy SILT, medium and fine grained, dry pale yellow (2.5Y 8/3)				
	8–10	Sandy SILT, fine grained, dry, black (2.5Y 2.5/1)	0.0ppm		Soil Sample 260611	

HTRW DRILLING LOG

HOLE NUMBER 26-06
SHEET 2 of 2

PROJECT Fort Stewart USTs
INSPECTOR L. Lumley

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	No Recovery	N/A			
	12					
	13	Sandy SILT, fine grained, dry, black (2.5Y 2.5/1)	1.0ppm			
	14					
	15					
	16	Sandy SILT, fine and medium grained moist, very dark brown (10YR2/2)	0.0ppm		Soil Sample 260621	
	17					
	18		0.0ppm			
	19					
	20					WET BELOW 20.0 FT BGS ▼ END OF DRILLING 20.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 26-07

PROJECT Fort Stewart USTs | INSPECTOR L. Lumley | SHEET 1 of 3

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	Insufficient Soil Recovery				
	2		0.1 ppm			
	3	Sandy SILT, fine to medium grained, dry light brownish gray (10YR 6/2)				
	4		0.1 ppm			
	5	Insufficient Soil Recovery				
	6	Sandy SILT, fine to medium grained, dry, dark brown (10YR 3/3) with pale yellow (2.5Y 8/4)	0.1 ppm			
	7					
	8					
	9		0.1 ppm		Soil Sample 260711	
	10					

HTRW DRILLING LOG

HOLE NUMBER 26-07

PROJECT Fort Stewart 4STs | INSPECTOR L. Lumley | SHEET 2 of 3

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 SILT, fine to medium grained, dry, black (10YR 2/1)	0.1 ppm	Soil Sample 260731		
	12					
	13					
	14		0.1 ppm			
	15	Sandy SILT, fine to medium grained, moist, dark brown (7.5YR 3/4) with pale yellow (2.5Y 8/4)				
	16		0.1 ppm		Soil Sample 260721	
	17					
	18					
	19		0.4 ppm			
	20					

HTRW DRILLING LOG

HOLE NUMBER 26-07

PROJECT Fort Stewart 4STs | INSPECTOR L. Lumley | SHEET 3 of 3

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)
	21	Silty SAND, fine to medium grained, wet, dark brown (7.5 YR 3/4)	N/A			
	22					
	23					▼ Wet below 23 FT BGS
	24		N/A			
	25					End of Drilling at 25.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 26-08

PROJECT Fort Stewart USTs | INSPECTOR L. Lumley | SHEET 1 of 3

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)
	0–5	No Recovery	N/A			
	3–4		N/A			
	5–10	No Recovery	N/A			
	8–9		N/A			

HTRW DRILLING LOG

HOLE NUMBER 26-08

PROJECT Fort Stewart USTs | INSPECTOR L. Lumley | SHEET 2 of 3

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 SILT, fine grained, dry, black (10YR 2/1)	0.6 ppm			
	12					
	13	No Recovery	N/A			
	14					
	15					
	16	No Recovery	N/A			
	17					
	18	Sandy SILT, fine grained, moist, very dark brown (10YR 1/2)	0.4 ppm	Soil Sample 260831		
	19					
	20					▼ Wet below 20.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 26-08
SHEET 3 of 3

PROJECT Fort Stewart USTs
INSPECTOR L. Lumley

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)
	21		N/A			
	22					
	23	Sandy SILT, fine grained, wet dark yellowish brown (10YR 4/6)	1.0ppm		Soil Sample 260811	
	24					
	25					
	26	Sandy SILT, fine grained, wet, dark yellowish brown (10YR 4/6)	0.3ppm			
	27					
	28					
	29		0.1ppm		Soil Sample 260821	
	30					End of Drilling 30.0 FT BGS

HTRW DRILLING LOG

HOLE NUMBER 26-09

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	SAND, well graded, fine to medium grained, dry, lt. greenish gley (8/10Y)				
	1	SAND with silt, fine grained, dry, very dark grayish brown (2.5YR 3/2)	102 ppm		Soil Sample 260911	
		Sandy SILT, fine grained, dry, lt. olive brown (2.5Y 5/4)				
	2	Sandy SILT with angular gravel, dry, brown (7.5YR 4/2)				
	3	Insufficient Recovery 2.5'-5'	N/A			
	4					
	5	Sandy SILT, fine grained, dry, grey (7.5 YR 5/1)				
	6	silty SAND, fine grained, dry, black (7.5YR 2.5/1)	19.8 ppm			
	7					
	8					
	9		26.5 ppm			
	10					

HTRW DRILLING LOG

HOLE NUMBER 26-09

PROJECT Fort Stewart 4STs | 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	Silty SAND, fine grained, moist, black (7.5 YR 2.5/1)	7.2 ppm			
	12					
	13		3.2 ppm	Soil Sample 260931	Soil Sample 260931	
	14					
	15					WET BELOW 15 FT BGS
	15	Silty SAND, fine grained, wet	N/A			
	16					
	17					
	18					
	19					
	20					END OF DRILLING AT 20.0 FT BGS

APPENDIX C

WELL CONSTRUCTION DIAGRAMS

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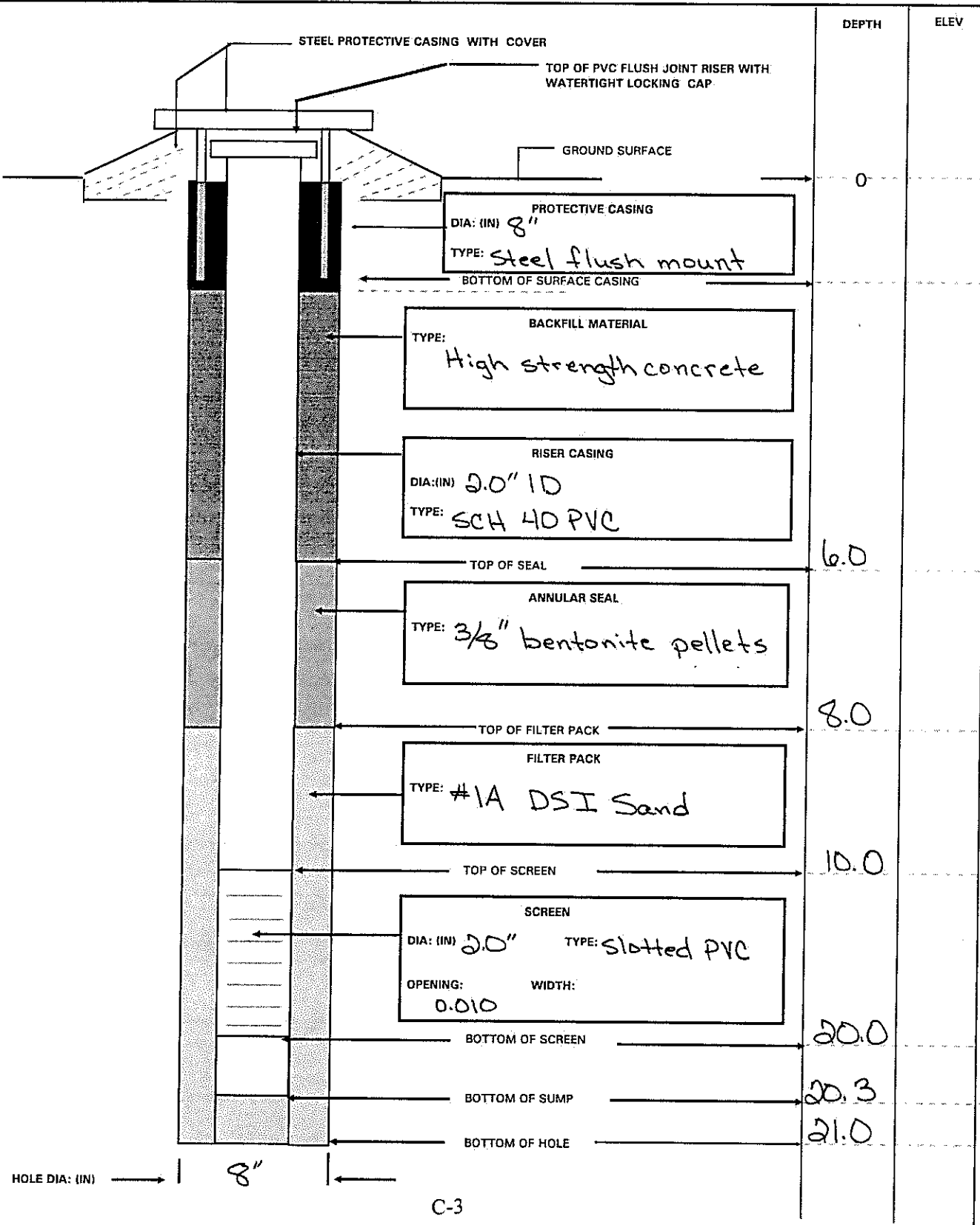
MONITORING WELL

PROJECT:

WELL NUMBER: 26-06 | **BEGIN:** 11/6/97 | **END:** 11/6/97

COORDINATES: N: E: | **REFERENCE POINT:** MSL | **ELEVATION:**



MONITORING WELL

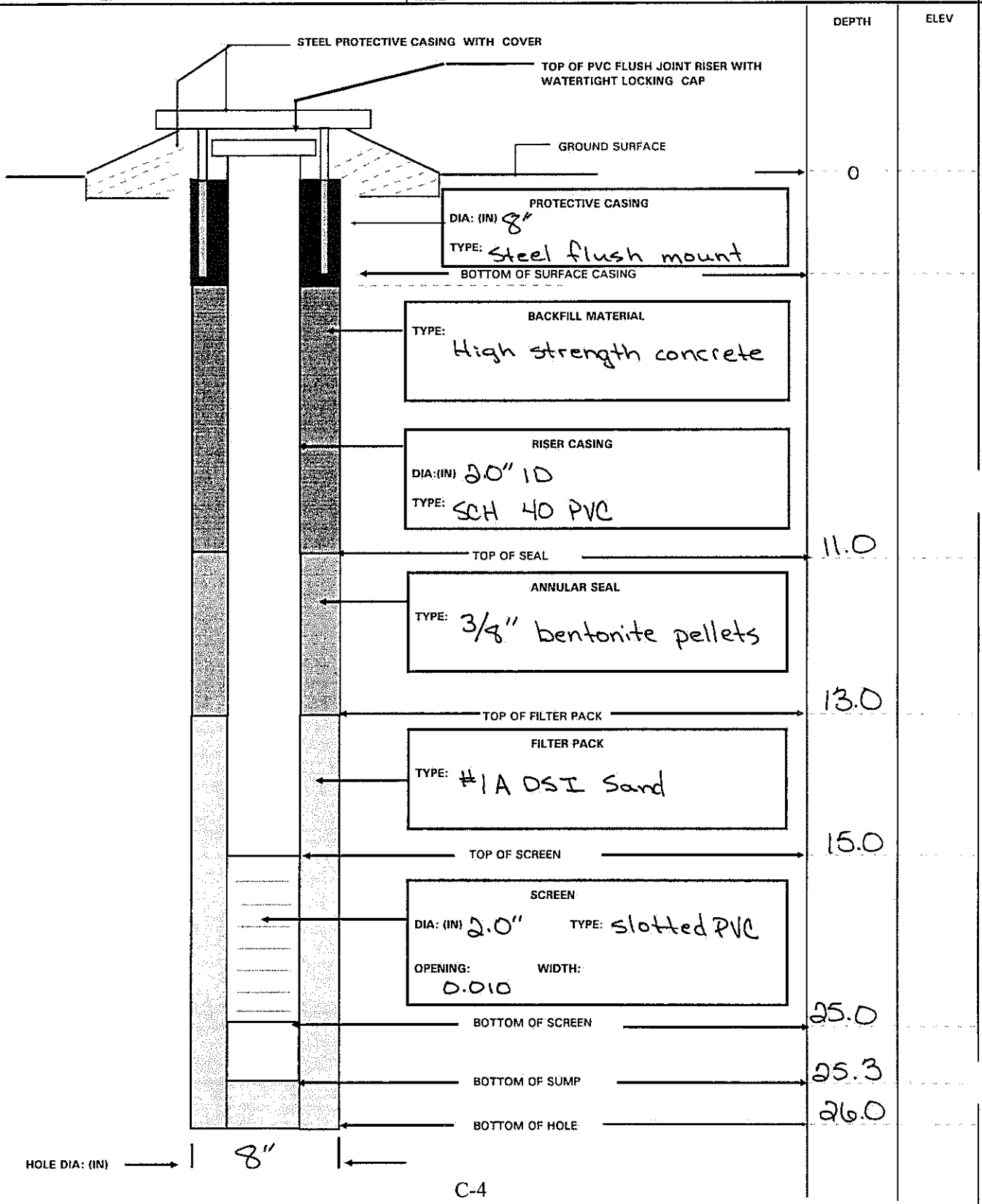
PROJECT:

WELL NUMBER: 26-07

BEGIN: 11/5/97 **END:** 11/5/97

COORDINATES: N:
E:

REFERENCE POINT: MSL **ELEVATION:**



MONITORING WELL

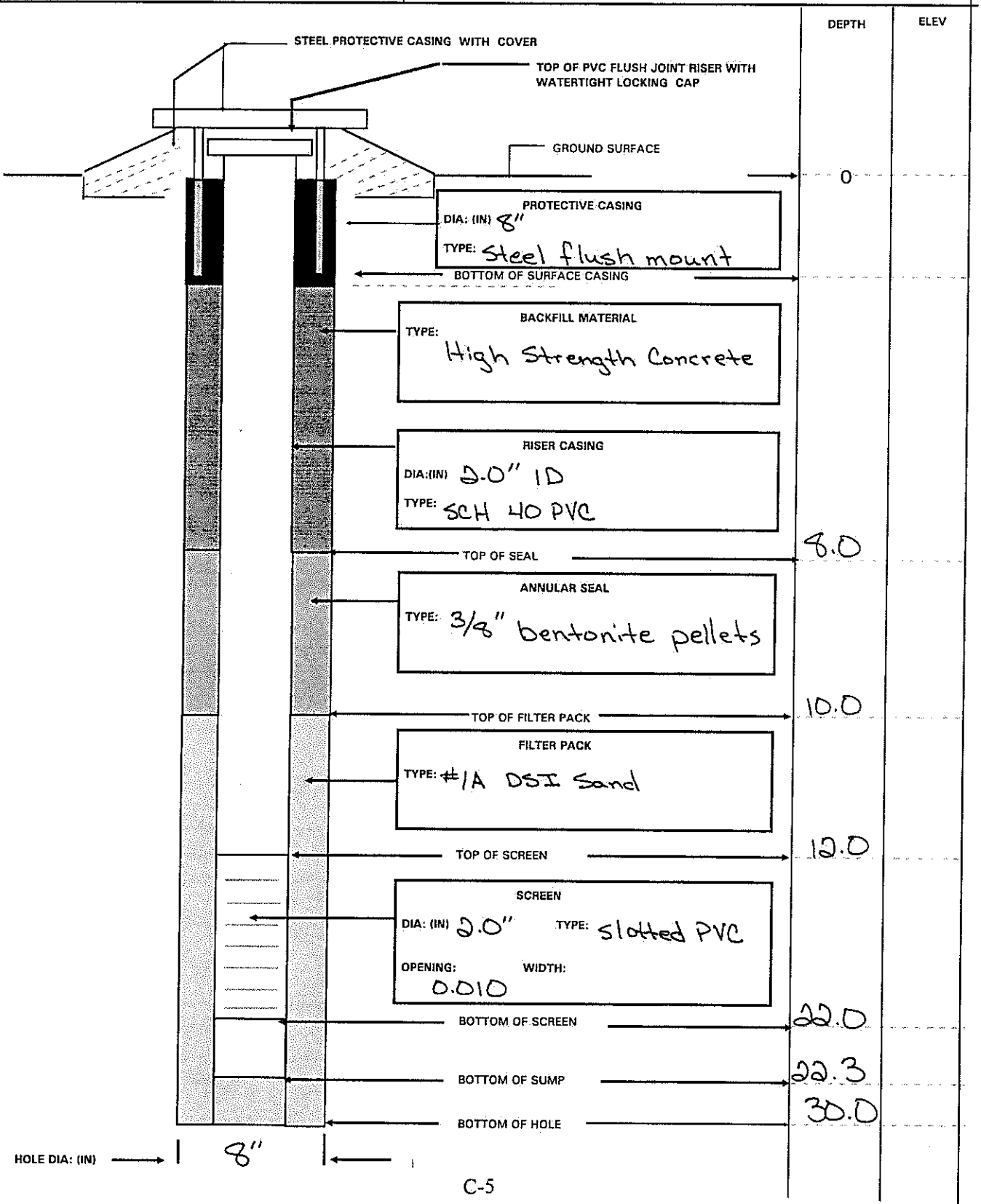
PROJECT:

WELL NUMBER: 26-08

BEGIN: 11/5/97 **END:** 11/5/97

COORDINATES: N: E:

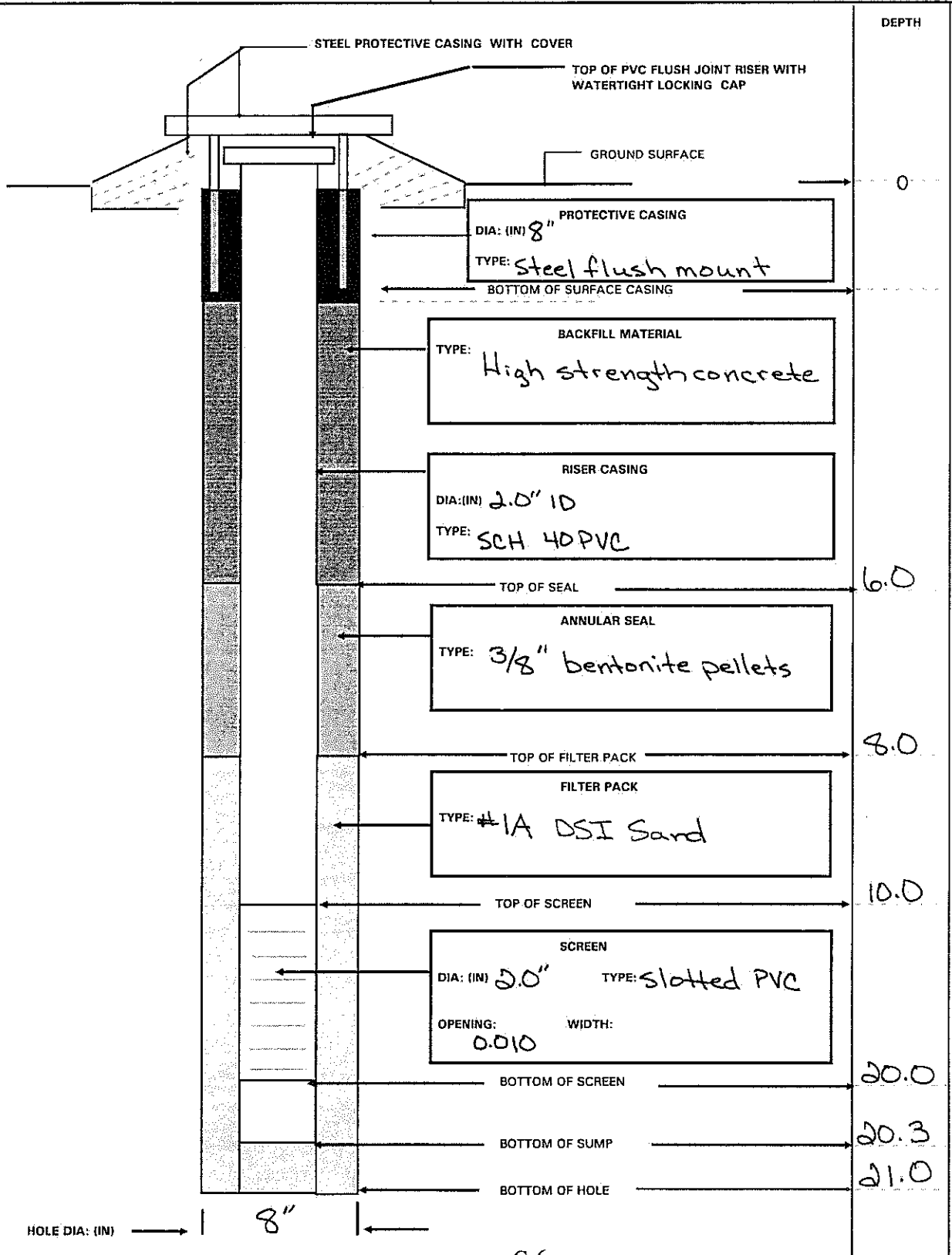
REFERENCE POINT: MSL **ELEVATION:**



MONITORING WELL

PROJECT:

WELL NUMBER: 26-09	**BEGIN:** 11/5/97	**END:** 11/5/97
COORDINATES: N: E:	**REFERENCE POINT:** MSL	**ELEVATION:**



APPENDIX D

HYDROGEOLOGIC DATA

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D.1 SOIL GEOTECHNICAL DATA

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SUMMARY TABLE OF RESULTS FOR CAP Part B

SAMPLE NO.	MOISTURE CONTENT (%)	ATTERBERG LIMITS FINES CLASSIFICATION LL	PL	PI	
141031	12.7	NONPLASTIC			
→ 260631	33.2	NONPLASTIC			
300831	28.7	28.5	21.5	7.0	CL-ML
320631	26.1	NONPLASTIC			
330631	19.9	NONPLASTIC			
480931	18.1	NONPLASTIC			
031031	24.3	26.3	14	12.3	CL
140731	50.4	118.3	32.5	85.8	CH
140831	25.0	NONPLASTIC			
151331	9.0	NONPLASTIC			
151431	19.2	NONPLASTIC			
→ 260731	8.2	NONPLASTIC			
→ 260831	24.0	NONPLASTIC			
→ 260931	10.8	NONPLASTIC			
300731	23.1	22.7	15.8	6.9	CL-ML
300931	35.7	34.8	11.5	23.3	CL
320731	7.0	NONPLASTIC			
320831	20.3	NONPLASTIC			
320931	35.7	NONPLASTIC			
330731	14.3	NONPLASTIC			
330831	35.8	NONPLASTIC			
330931	13.6	NONPLASTIC			
480731	23.1	23.0	18.7	4.3	CL-ML
480831	14.7	NONPLASTIC			

SIEVE ANALSIS (% PASSING)

3"	2"	1 1/2"	3/4"	3/8"	#4	#10	#20	#40	#60	#140	#200
100	100	100	100	100	98.9	91.3	56.2	31.8	18.0	0.8	0.5
100	100	100	100	97.8	94.3	92.3	88.8	81.7	65.9	3.2	2.1
100	100	100	100	100	99.0	74.0	55.5	44.9	28.1	3.4	1.8
100	100	100	100	100	100	96.0	92.6	88.5	78.0	3.7	1.7
100	100	100	100	100	100	89.28	75.3	67.0	60.0	8.6	3.2
100	100	100	100	100	100	89.6	43.9	8.9	1.4	0.3	0.1
100	100	100	100	100	100	100	82.6	67.4	48.4	7.6	4.7
100	100	100	100	100	100	98.8	95.0	94.3	94.0	92.7	92.3
100	100	100	100	99.8	97.2	91	74.1	50.0	25.7	1.5	0.6
100	100	100	100	100	100	99.7	71.3	51.0	35.5	3.2	2.2
100	100	100	100	100	99.8	99.2	88.1	77.6	61.4	2.6	1.9
100	100	100	100	100	100	100	97.8	88.8	69.6	3.4	2.5
100	100	100	100	100	100	100	98.9	93.2	82.6	4.3	3.4
100	100	100	100	100	100	99.9	98.3	95.5	85.3	3.1	5.4
100	100	100	100	100	93.8	68.9	50.2	38.6	27.8	8.9	6.2
100	100	100	100	100	80.1	51.9	36.9	27.9	20.2	4.2	3.4
100	100	100	100	94.3	90.7	87.7	73.3	53.3	36.8	4.3	2.6
100	100	100	100	100	99.8	97.2	84.6	51.2	19.1	1.5	0.6
100	100	100	100	100	100	98.3	87.1	71.4	50.2	2.1	1.0
100	100	100	100	100	99.1	98.9	80.8	65.2	47.8	7.7	5.7
100	100	100	100	97.1	90.9	73.4	49.1	33.6	23.0	4.3	11.1
100	100	100	100	95.8	81.0	62.9	47.2	35.9	25.1	2.7	2.0
100	100	100	100	100	100	91.9	72.3	64.4	58.7	15.0	6.1
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

D-5

CATLIN Engineers and Scientists
Geotechnical Laboratories

PERMEABILITY TEST ANALYSIS (ASTM D5084)

Project : Fort Stewart, GA

Location of Project : CAP Part B

Description of Soil : Brownish Gray Fine Grain Sand

Job # : 97223
Date of Testing: 11/28-12/4/97
Tested by: BV-CA
Boring # :
Sample # : 260631
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: 10.05

Sample Dimensions		
	Before	After
Length (cm)	7.00	6.30
Diameter (cm)	7.10	7.50
Water Content (%)	10.14	22.87
Weight (g)	--	497.5

Constant Head Calculation:

$$K = [V(t_1,t_2)\ LR_T]/[P_BAt]\ (cm/sec)$$

$V(t_1,t_2)$ = Volume of flow from t_1 to t_2 (cm^2)
L = Length of Sample = 7.00 cm
A = Area of Sample = 39.59 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

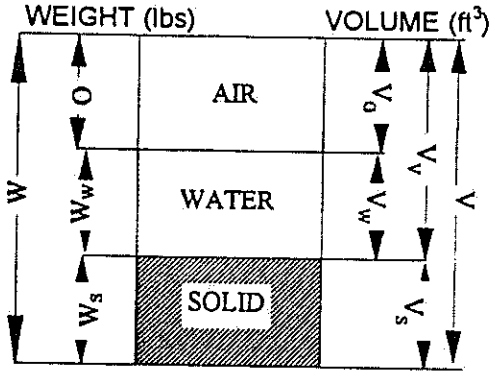
t_2 (sec)	t_1 (sec)	$(t_2 - t_1)$ (sec)	V (cm^3)	$[LR_T]/[P_BA]$ (cm^3)	K (cm/sec)
10	5	5	1	2.34E-03	4.68E-04
15	10	5	1	2.34E-03	4.68E-04
20	15	5	1	2.34E-03	4.68E-04
25	20	5	1	2.34E-03	4.68E-04

K_{avg} = 4.68E-04 cm/sec

SPECIFIC GRAVITY AND POROSITY

PROJECT: Fort Stewart, GA
LOCATION OF PROJECT: CAP Part B
DESCRIPTION OF SOIL: Brownish Gray Fine Sand
TESTED BY: c. agustin

JOB NO.: 97223
SAMPLE NO.: 260631
DEPTH OF SAMPLE: 5-7 ft.
DATE OF TESTING: 12/4/97



W = 1.54519
$W_W = W - W_S$ = 0.14926
$W_S = Y_d * V$ = 1.3959

V = 0.01458
$V_W = W_W / Y_W$ = 0.0024
$V_S = W_S / G_S * Y_W$ = 0.0084
$V_G = V - (V_S + V_V)$ = 0.00375
$V_V = V_G + V_W$ 0.0061

MEASUREMENTS OF TUBE/CAN

HEIGHT= 10.0 cm
DIAMETER= 7.25 cm

CALCULATED VOLUME OF TUBE/CAN

V= 412.82 cm^3
0.01458 ft^3

WT. OF TUBE/CAN + WET SOIL= 988.20 g
WEIGHT OF TUBE/CAN= 287.3 g
WEIGHT OF WET SOIL= 700.90 g
W = 1.54519 lb

MOISTURE CONTENT

M_{CWS} = 27.35 g
M_{CDS} = 25.76 g
M_W = 1.59 g
M_C = 10.89 g
M_S = 14.87 g
w = 10.7 %

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= 105.97 lbs/ft^3
Y_d= 95.74 lbs/ft^3	Y_d= 95.74 lbs/ft^3

Void Ratio, $e = V_V / V_S$
e = 0.7281

Porosity, $n = V_V / V$
n = 0.42

Specific Gravity = 2.65

Degree of Saturation, $S = V_W / V_V$
S = 0.3892

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D.2 SLUG TEST DATA

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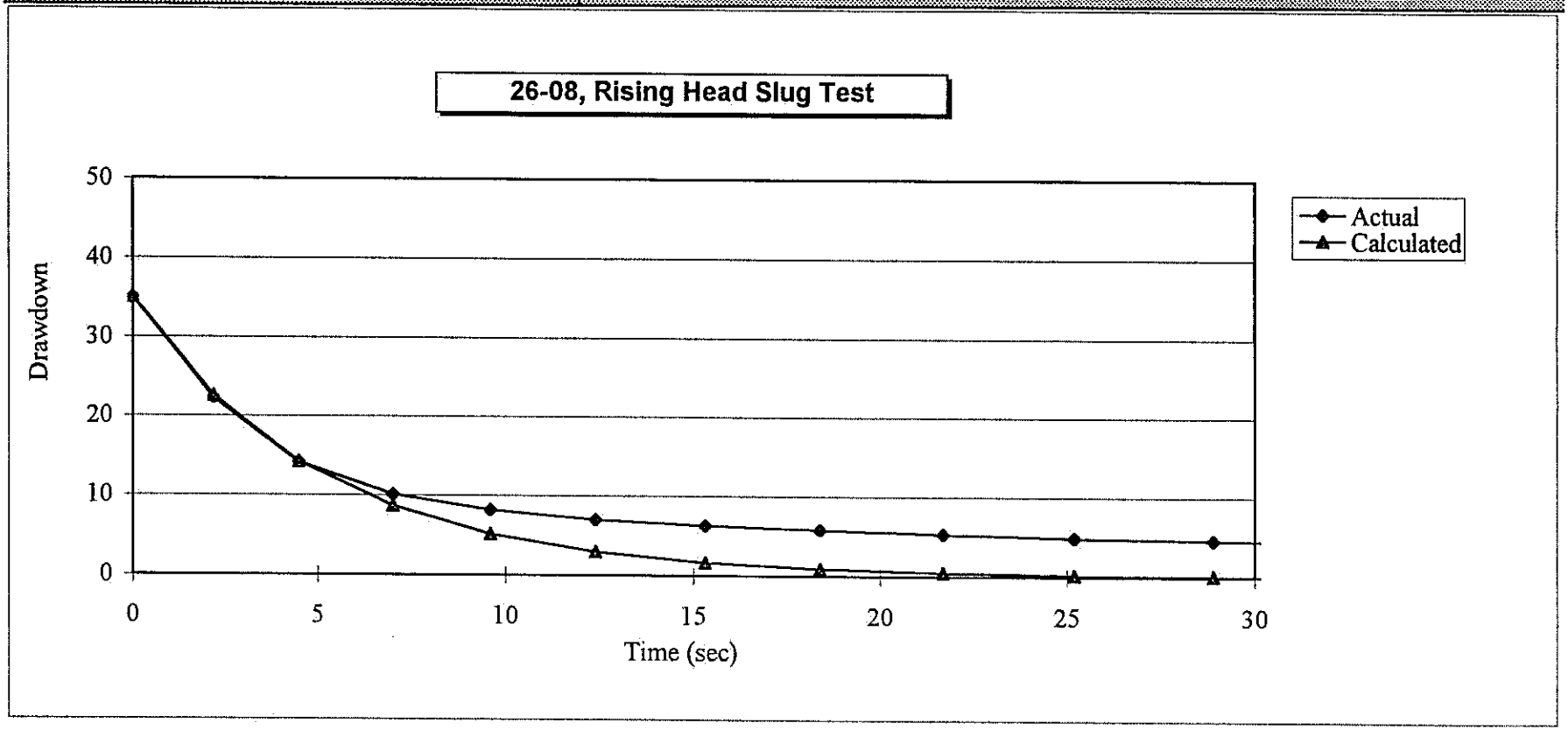
Slug Test Hydraulic Conductivity (K) Calculation

Well ID	**26-08**	Test Date	12/16/97
Test Type	**Rising Head**	Evaluation Method	Bouwer & Rice

Borehole Parameters			Calculation Parameters				
Pretest water level	15.87	ft bgs	Radius of casing (rc^2)	6.45	cm	ln R/rw	1.66
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)	24.13	ft	Length of screen (Le)	304.80	cm		
Screen length (Le)	10.00	ft	Distance from static water level (Yo)	35.00	cm		
Saturated penetration (Lw)	6.13	ft	**Hydraulic conductivity (K)**	**3.50E-03**	**cm/sec**		



26-08 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)
0.000	1.1483	0.00	0.00	35.0000	0.0000	3.50E+01
0.037	0.7316	2.20	2.20	22.3000	0.4390	2.26E+01
0.075	0.4659	4.50	4.50	14.2000	0.8972	1.43E+01
0.117	0.3314	7.00	7.00	10.1000	1.3960	8.67E+00
0.160	0.2690	9.60	9.60	8.2000	1.9140	5.16E+00
0.207	0.2297	12.40	12.40	7.0000	2.4726	2.95E+00
0.255	0.2067	15.30	15.30	6.3000	3.0504	1.66E+00
0.307	0.1903	18.40	18.40	5.8000	3.6688	8.93E-01
0.362	0.1739	21.70	21.70	5.3000	4.3267	4.62E-01
0.420	0.1608	25.20	25.20	4.9000	5.0241	2.30E-01
0.482	0.1509	28.90	28.90	4.6000	5.7622	1.10E-01
0.547	0.1444	32.80	32.80	4.4000	6.5398	5.06E-02
0.617	0.1345	37.00	37.00	4.1000	7.3771	2.19E-02
0.690	0.1280	41.40	41.40	3.9000	8.2539	9.11E-03
0.768	0.1214	46.10	46.10	3.7000	9.1918	3.57E-03
0.852	0.1115	51.10	51.10	3.4000	10.1882	1.32E-03
0.940	0.1050	56.40	56.40	3.2000	11.2445	4.58E-04
1.033	0.0984	62.00	62.00	3.0000	12.3618	1.50E-04
1.132	0.0951	67.90	67.90	2.9000	13.5377	4.62E-05
1.237	0.0919	74.20	74.20	2.8000	14.7937	1.32E-05
1.347	0.0886	80.80	80.80	2.7000	16.1095	3.53E-06
1.463	0.0787	87.80	87.80	2.4000	17.5055	8.74E-07
1.588	0.0787	95.30	95.30	2.4000	19.0008	1.96E-07
1.720	0.0689	103.20	103.20	2.1000	20.5751	4.06E-08
1.860	0.0722	111.60	111.60	2.2000	22.2498	7.61E-09
2.008	0.0656	120.50	120.50	2.0000	24.0250	1.29E-09
2.165	0.0656	129.90	129.90	2.0000	25.8983	1.98E-10
2.332	0.0656	139.90	139.90	2.0000	27.8924	2.70E-11
2.508	0.0591	150.50	150.50	1.8000	30.0061	3.26E-12

26-08 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)
2.695	0.0591	161.70	161.70	1.8000	32.2382	3.49E-13
2.893	0.0591	173.60	173.60	1.8000	34.6115	3.25E-14
3.103	0.0591	186.20	186.20	1.8000	37.1236	2.64E-15
3.325	0.0525	199.50	199.50	1.6000	39.7744	1.86E-16
3.560	0.0525	213.60	213.60	1.6000	42.5856	1.12E-17
3.808	0.0525	228.50	228.50	1.6000	45.5570	5.74E-19
4.072	0.0492	244.30	244.30	1.5000	48.7067	2.46E-20
4.352	0.0492	261.10	261.10	1.5000	52.0561	8.64E-22
4.648	0.0492	278.90	278.90	1.5000	55.6053	2.48E-23
4.962	0.0492	297.70	297.70	1.5000	59.3530	5.85E-25
5.293	0.0427	317.60	317.60	1.3000	63.3209	1.11E-26
5.645	0.0427	338.70	338.70	1.3000	67.5268	1.65E-28
6.018	0.0427	361.10	361.10	1.3000	71.9935	1.90E-30
6.413	0.0427	384.80	384.80	1.3000	76.7186	1.68E-32
6.832	0.0427	409.90	409.90	1.3000	81.7224	1.13E-34
7.275	0.0427	436.50	436.50	1.3000	87.0253	5.62E-37
7.745	0.0492	464.70	464.70	1.5000	92.6476	2.03E-39
8.243	0.0427	494.60	494.60	1.3000	98.6095	5.23E-42
8.770	0.0427	526.20	526.20	1.3000	104.9088	9.61E-45
9.328	0.0427	559.70	559.70	1.3000	111.5886	1.21E-47
9.920	0.0427	595.20	595.20	1.3000	118.6654	1.02E-50
10.547	0.0427	632.80	632.80	1.3000	126.1622	5.66E-54
11.210	0.0427	672.60	672.60	1.3000	134.0967	2.03E-57
11.913	0.0427	714.80	714.80	1.3000	142.5110	4.49E-61
12.658	0.0427	759.50	759.50	1.3000	151.4228	6.05E-65
13.448	0.0427	806.90	806.90	1.3000	160.8730	4.76E-69
14.285	0.0394	857.10	857.10	1.2000	170.8806	2.15E-73

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APPENDIX E

GROUNDWATER TRANSPORT MODELING DATA

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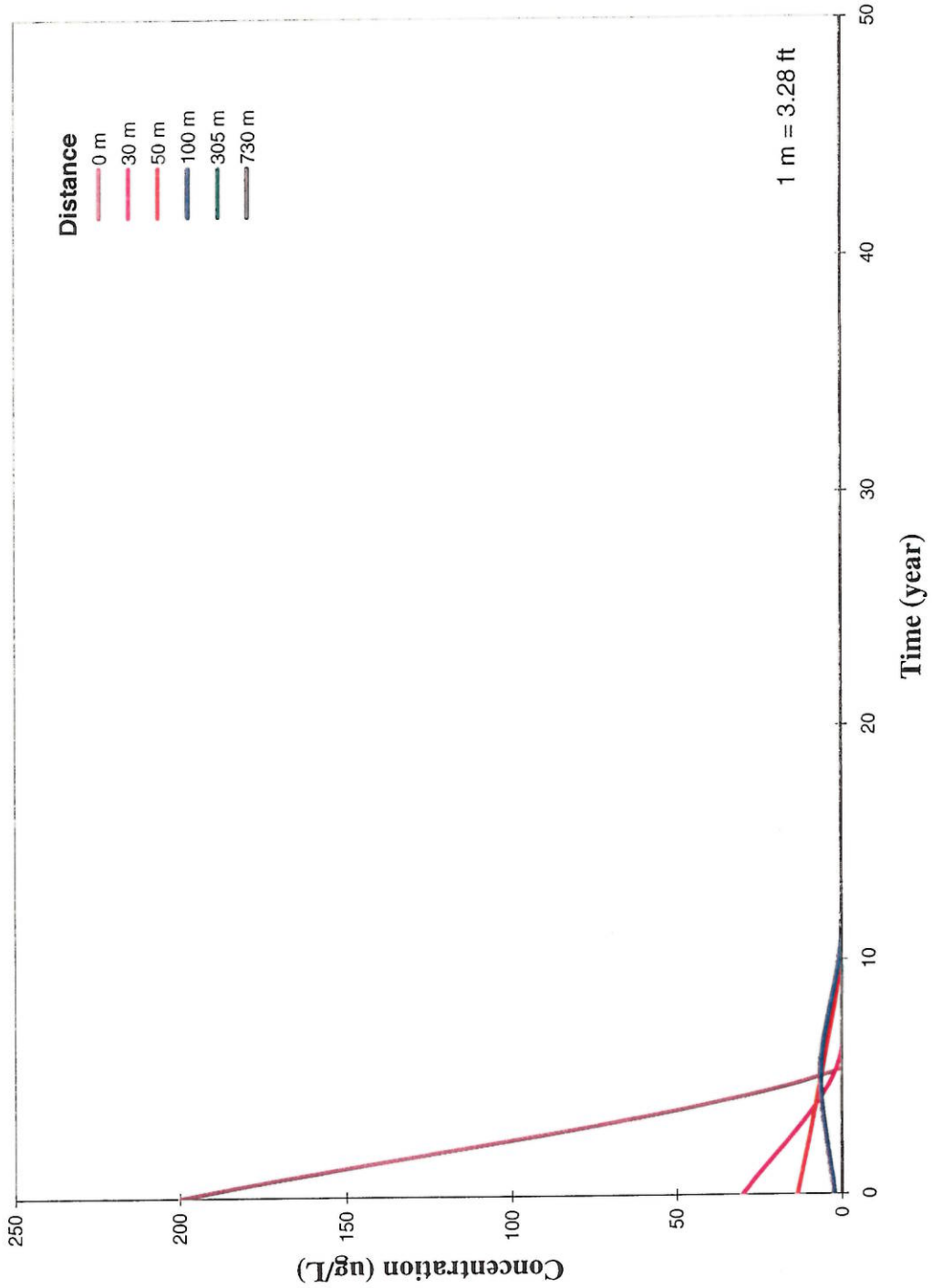
AT123D modeled concentration of benzene in groundwater at different distances from the source (UST 70)



Ft Stewart, UST 70, 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	122
NO. OF ENDING TIME STEP	1216
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	65
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)	0.7010E+01
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.3050E+01
END POINT OF X-SOURCE LOCATION (METERS)	0.3050E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.1530E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.1530E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.2000E+01

POROSITY	0.3000E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.1260E+00
HYDRAULIC GRADIENT	0.9400E-02
LONGITUDINAL DISPERSIVITY (METER)	0.4000E+01
LATERAL DISPERSIVITY (METER)	0.1000E+01
VERTICAL DISPERSIVITY (METER)	0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.3410E-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)	0.1537E+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)	0.7200E+03
DISCHARGE TIME (HR)	0.8760E+05
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.1173E-04

RETARDATION FACTOR	0.2747E+01
RETARDED DARCY VELOCITY (M/HR)	0.1437E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.5753E-02
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.1441E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.1441E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
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 0.8712E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.367E-01	0.334E-01	0.231E-01	0.118E-01	0.243E-02	0.000E+00	0.000E+00
4.	0.592E-01	0.387E-01	0.254E-01	0.125E-01	0.250E-02	0.000E+00	0.000E+00
3.	0.943E-01	0.436E-01	0.274E-01	0.131E-01	0.255E-02	0.000E+00	0.000E+00
2.	0.140E+00	0.476E-01	0.290E-01	0.135E-01	0.259E-02	0.000E+00	0.000E+00
0.	0.200E+00	0.512E-01	0.303E-01	0.138E-01	0.263E-02	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1339E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.266E-04	0.232E-03	0.538E-03	0.182E-02	0.334E-02	0.322E-06	0.000E+00
4.	0.389E-04	0.336E-03	0.775E-03	0.255E-02	0.405E-02	0.329E-06	0.000E+00
3.	0.562E-04	0.483E-03	0.110E-02	0.353E-02	0.489E-02	0.334E-06	0.000E+00
2.	0.772E-04	0.660E-03	0.150E-02	0.470E-02	0.579E-02	0.337E-06	0.000E+00
0.	0.103E-03	0.879E-03	0.199E-02	0.612E-02	0.680E-02	0.340E-06	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1807E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.447E-07	0.454E-06	0.127E-05	0.776E-05	0.163E-03	0.735E-05	0.000E+00
4.	0.650E-07	0.660E-06	0.185E-05	0.111E-04	0.224E-03	0.754E-05	0.000E+00
3.	0.935E-07	0.948E-06	0.265E-05	0.159E-04	0.308E-03	0.769E-05	0.000E+00
2.	0.128E-06	0.129E-05	0.361E-05	0.215E-04	0.405E-03	0.780E-05	0.000E+00
0.	0.171E-06	0.172E-05	0.480E-05	0.285E-04	0.524E-03	0.789E-05	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2275E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.827E-10	0.910E-09	0.274E-08	0.207E-07	0.118E-05	0.162E-04	0.000E+00
4.	0.120E-09	0.132E-08	0.397E-08	0.299E-07	0.167E-05	0.177E-04	0.000E+00
3.	0.173E-09	0.189E-08	0.569E-08	0.428E-07	0.235E-05	0.194E-04	0.000E+00
2.	0.235E-09	0.258E-08	0.776E-08	0.582E-07	0.316E-05	0.210E-04	0.000E+00
0.	0.313E-09	0.344E-08	0.103E-07	0.773E-07	0.415E-05	0.227E-04	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2743E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.140E-11	0.586E-11	0.493E-10	0.478E-08	0.808E-05	0.000E+00
4.	0.000E+00	0.231E-11	0.853E-11	0.713E-10	0.684E-08	0.998E-05	0.000E+00
3.	0.000E+00	0.362E-11	0.123E-10	0.102E-09	0.969E-08	0.123E-04	0.000E+00
2.	0.000E+00	0.521E-11	0.168E-10	0.139E-09	0.131E-07	0.149E-04	0.000E+00
0.	0.000E+00	0.717E-11	0.224E-10	0.185E-09	0.173E-07	0.180E-04	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3211E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.153E-10	0.740E-06	0.450E-12
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.220E-10	0.973E-06	0.459E-12
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.312E-10	0.128E-05	0.466E-12
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.424E-10	0.163E-05	0.471E-12
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.561E-10	0.204E-05	0.475E-12

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3679E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.405E-13	0.219E-07	0.188E-10
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.623E-13	0.297E-07	0.192E-10
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.901E-13	0.401E-07	0.196E-10
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.120E-12	0.523E-07	0.198E-10
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.153E-12	0.670E-07	0.200E-10

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4147E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.321E-09	0.124E-09
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.443E-09	0.129E-09
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.608E-09	0.133E-09
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.803E-09	0.137E-09
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.104E-08	0.141E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4615E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.298E-11	0.258E-09
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.416E-11	0.282E-09
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.578E-11	0.309E-09
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.769E-11	0.336E-09
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.100E-10	0.365E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5083E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.203E-13	0.207E-09
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.286E-13	0.241E-09
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.400E-13	0.282E-09
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.535E-13	0.326E-09
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.700E-13	0.376E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5551E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

	X						
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.113E-15	0.665E-10
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.162E-15	0.816E-10
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.230E-15	0.100E-09
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.311E-15	0.121E-09
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.411E-15	0.145E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6019E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

				X			
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.974E-11
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.124E-10
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.157E-10
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.195E-10
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.240E-10

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6487E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

				X			
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.750E-12
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.976E-12
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.127E-11
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.161E-11
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.201E-11

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6955E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

				X			
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.345E-13
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.457E-13
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.605E-13
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.776E-13
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.981E-13

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7423E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

				X			
Y	0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.105E-14
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.141E-14
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.189E-14
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.244E-14
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.312E-14

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7891E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.228E-16
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.309E-16
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.418E-16
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.546E-16
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.700E-16

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8359E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.3410E+00 * DISSOLVED CHEMICAL CONC.)
Z = 0.00

Y	X 0.	20.	30.	50.	100.	305.	730.
5.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.375E-18
4.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.514E-18
3.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.700E-18
2.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.919E-18
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.119E-17

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APPENDIX F

ALTERNATE CONCENTRATION LIMIT CALCULATIONS

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No ACLs were calcuated for the UST 70 site, Facility ID #9-089019.

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APPENDIX G

PUBLIC NOTIFICATION

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Science Applications International Corporation
An Employee-Owned Company

January 26, 1998

Savannah Morning News
P.O. Box 1088
Savannah, Georgia 31402
Attn: Ms. Lily Lang

Dear Ms. Lang:

Enclosed is a Public Notification Letter regarding implementation of Corrective Action Plan - Part B, to investigate and/or remediate contamination of soil and/or groundwater releases from underground storage tanks at Fort Stewart. This is a legal advertisement that we would like to have published in your newspaper on Sunday, February 8 and 15, 1998.

Please use the enclosed self-addressed, stamped envelope to return an affidavit verifying the two dates this Public Notification Letter was published.

Charges for publication of this Public Notification Letter may be submitted to me at the following address:

Barbara Hebb
Science Applications International Corporation
P.O. Box 2502
Oak Ridge, Tennessee 37831

Please feel free to call me at (423) 481-8753 if you have any questions.

Thank you for your cooperation and prompt attention to this request.

Sincerely yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Barbara Hebb
Community Relations Specialist

Enc: Public Notification Letter

xc: Greg Grim, Program Manager
Patty Stoll, Project Manager

800 Oak Ridge Turnpike, P.O. Box 2502, Oak Ridge, Tennessee 37831 (423) 481-4600
Other SAIC Offices: Albuquerque, Boston, Colorado Springs, Dayton, Huntsville, Las Vegas, Los Angeles, McLean, Orlando, Palo Alto, San Diego, Seattle, Tucson

**** PUBLIC NOTICE ****

Notification of Corrective Action Plan
Underground Storage Tank Releases
Fort Stewart Garrison Area
Fort Stewart, Georgia

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 after February 17, 1998. A listing of the UST sites for which CAP Part B reports have been prepared is presented at the end of this notification.

The 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, Georgia 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, Georgia 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	70
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

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 after February 17, 1998. A listing of the UST sites for which CAP Part B reports have been prepared is presented at the end of this notification.
The 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
9-089086; 1636/1634; 29
9-089018; 1622; 33, 34, and 35
9-089019; 955; 70
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

G-6

Form 121 rev.