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HSRA Compliance Status Report
DERP-FUDS Project No. I04GA081302
Former Macon Naval Ordnance Plant
Allied Industrial Park (HSI #10308)
Macon, Georgia

Prepared For

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

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SAIC

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EXECUTIVE SUMMARY

Environmental investigations of the Allied Industrial Park (AIP) conducted from 1996 through 2000 were compiled, presented, and interpreted in this Hazardous Site Response Act (HSRA) compliance status report. Results and interpretations for the AIP are:

Soil

The HSRA screening of AIP soil samples identified relatively few constituents (1,2-Dichloroethene, antimony, cadmium, tetrachloroethene, trichloroethene, and zinc) that exceeded Type 1 HSRA standards. Only trichloroethene (TCE) exceeded the Type 2 HSRA standards. TCE exceeded the standards only at locations ISL-4 and ISL-117. All soil samples were in compliance with Type 4 HSRA standards.

The limited number of constituents and sample locations that exceeded HSRA standards is indicative of the relatively low impact associated with this medium. No clear source areas were found in relation to the TCE plume. Given the few stations that exceeded the HSRA standards, a limited soil removal could potentially bring the AIP into compliance with the Type 2 (residential) HSRA standards.

Groundwater

The primary concern with groundwater at the AIP is the TCE contamination across the site. The lateral extent of three TCE plumes has been defined (see Figure 4-2). These three distinct plumes trend north to south across the AIP, and are apparently associated with areas of increased hydraulic conductivity identified in the hydrogeologic investigation. A large majority of the plumes exhibit concentrations that exceed HSRA standards.

The vertical extent of the westernmost plumes is considered well characterized where the Water Table Aquifer is thin (< 15 feet thick). However, current data indicate the southeastern quadrant of the AIP has a greater water table thickness (> 30 feet thick). Monitoring wells installed during the 2000 field investigation were screened near the base of the Water Table Aquifer and exhibited significant TCE contamination. No results from the underlying Tuscaloosa Aquifer are available for the AIP however, monitoring wells screened within and below the MNOP Confining Unit at the MNOP Landfill indicate that groundwater contamination has crossed that hydrologic unit and entered the Tuscaloosa Aquifer.

The presence of the high organic concentrations at the base of the Water Table Aquifer and the presence of low concentrations of TCE in the Tuscaloosa Aquifer at the Landfill indicates the vertical extent of groundwater contamination at the AIP may not be completely defined. There is a high degree of concern over potential vertical migration since the Tuscaloosa Aquifer is the source of several operating industrial production wells on and adjacent to the AIP. Although local production wells are reportedly only used as a source of industrial process water, the possibility of contamination in a significant regional aquifer system may require further investigation and/or remediation.

Surface Water and Sediment

Samples of surface water and sediment in the middle AIP drainage feature indicate it is not impacted by any AIP related constituents. The water table TCE plume is not expressing into this feature during periods of low water table, although it is possible that groundwater could intersect this drainage feature during periods of high water table. Given the minimal number of constituents and concentrations documented in surface water and sediment, these media require no further action. No sediment results exceeded the HSRA Type 1 soil standards. No surface water result exceeded the Georgia Water Quality Standards.

HSRA Certification Statement

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

Based on my review of the findings of this report with respect to the risk reduction standards of the Rules for Hazardous Site Response, Rule 391-3-19-07, I have determined that:

1) Groundwater at this site is not in compliance with any Type risk reduction standard.

2) Soil at this site is in compliance with Type 4 risk reduction standards.

3) Sediment at this site is in compliance with Type 1 risk reduction standards.

4) Surface water at this site is in compliance with Georgia Water Quality Standards.

P. W. ALBENESIUS
No. 1337
GEORGIA REGISTERED PROFESSIONAL GEOLOGIST

PW Allen | 8/18/00
Authorized Signature | Date

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LIST OF ACRONYMS

2X	two times
AIP	Allied Industrial Park
AST	above ground storage tank
ASTM	American Society for Testing and Materials
bls	below land surface
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	centimeters per second
COE	Army Corps of Engineers
CPT	cone penetrometer testing
DPT	direct push technology
US EPA	United States Environmental Protection Agency
EPD	Georgia Environmental Protection Division
ESE	Environmental Science and Engineering, Inc.
ft/day	feet per day
GPS	Global Positioning System
HIS	Hazardous Site Inventory
HSRA	Hazardous Site Response Act
HTRW	Hazardous Toxic Radioactive Waste
IDW	investigation-derived waste
MBCIA	Macon-Bibb County Industrial Authority
MNOP	Macon Naval Ordnance Plant
NAD 83	North American Datum of 1983
NAVD	North American Vertical Datum 1998
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PID	photoionization detector
pp	priority pollutant
ppm	parts per million
PVC	polyvinyl chloride

LIST OF ACRONYMS (Continued)

QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QCSR	Quality Control Summary Report
RBC	Risk Based Concentrations
Rust	Rust E&I
SAIC	Science Applications International Corporation
SVOC	semivolatile organic compounds
TCE	trichloroethene
TCLP	Toxicity Characteristic Leachate Procedure
TPH	total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
UST	underground storage tank
VOA	volatile organic analyte
VOC	volatile organic compounds
WEGS	Westinghouse Environmental and Geotechnical Services, Inc.
WWTF	Waste Water Treatment Facility

1.0 INTRODUCTION

This compliance status report describes the environmental investigation conducted by Science Applications International Corporation (SAIC) at the Allied Industrial Park (AIP), which is a portion of the former Macon Naval Ordnance Plant (MNOP). The investigation was conducted to assess groundwater, surface water, sediment, and soil, and included the collection of geologic, hydrogeologic, and chemical data from across the AIP. The Georgia Hazardous Site Inventory (HSI) currently lists the AIP (HSI number 10308) as a Class II site under the Georgia Hazardous Site Response Act (HSRA) (Georgia Environmental Protection Division [EPD] 1995). The intent of the current investigation was to fully document the nature and extent of contamination and establish the site's compliance status relative to HSRA.

This compliance status report was prepared by SAIC for the Savannah District of the Army Corps of Engineers (COE) in accordance with Contract Number DACA21-95-D-0022, Delivery Order 0017.

1.1 Site Description

The former MNOP includes two separate areas that were recently investigated: the MNOP Landfill and the AIP. The AIP/Landfill site is east of U.S. Highway 129 Business on Guy Paine Road, and occupies just over 430 acres (Figure 1-1). Figure 1-2 is a site map of the AIP/Landfill. The AIP is shown in greater detail in Figure 1-3.

The ongoing environmental investigation of the MNOP Landfill is being completed under the purview of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A Phase I Remedial Investigation of the MNOP landfill was recently completed (SAIC 2000). The AIP, however, is being investigated under the purview of HSRA and is the focus of this report. Given the proximity of the two areas, there is some overlap between the investigations. However, only AIP data were used in the quantitative comparisons with HSRA criteria and the subsequent determination of compliance status.

The MNOP was constructed and operated by the Reynolds Corporation prior to World War II. The Navy assumed operations in 1941 and continued operations until 1965 for the production of ordnance. Most of the existing buildings and infrastructure at the AIP were originally part of the MNOP. After naval operations ceased, some of the industrial park property, primarily the southern half, was sold for industrial development. The AIP is currently being developed by the Macon-Bibb

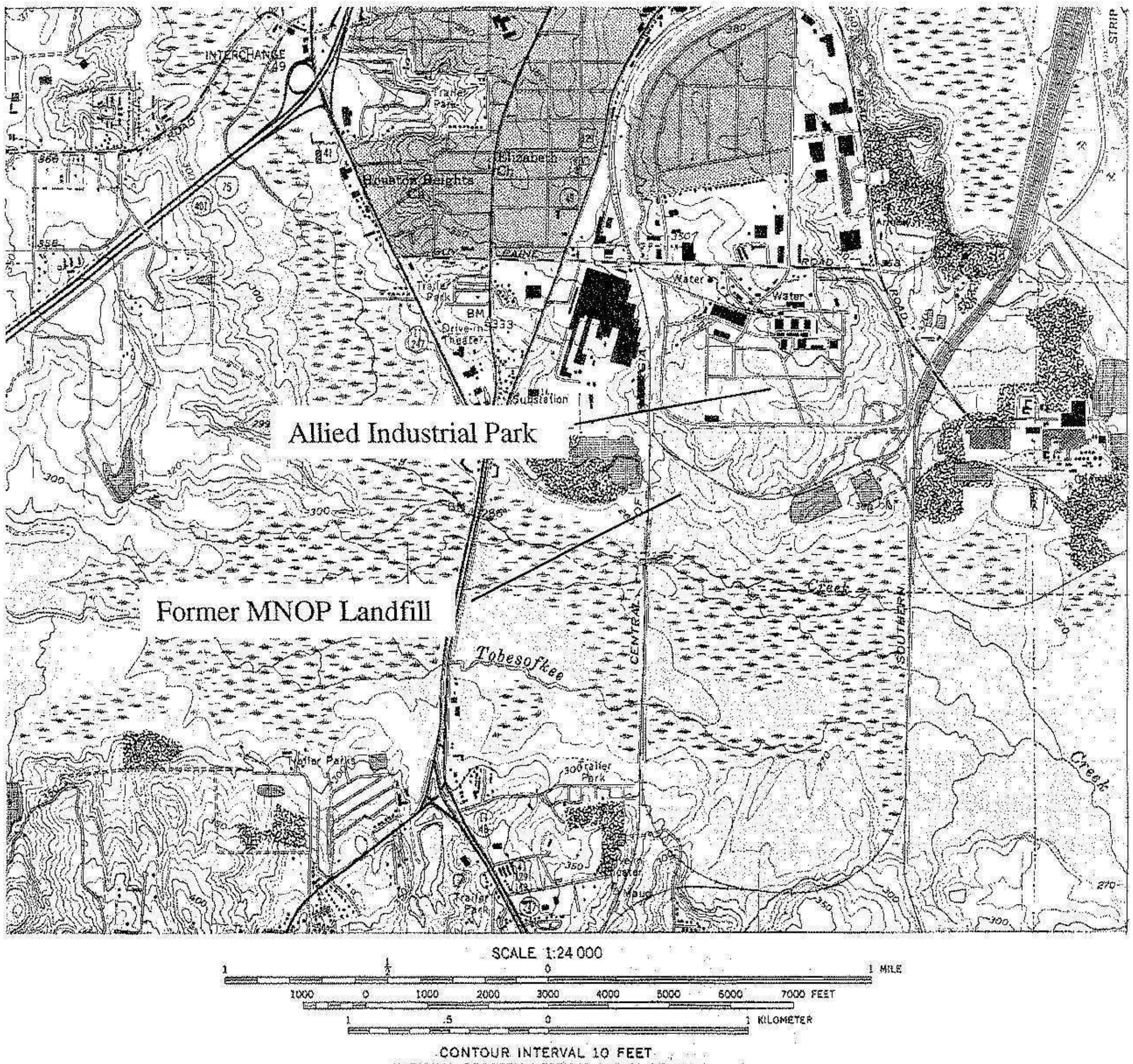

Figure 1-1. Location of AIP and Former MNOP Landfill

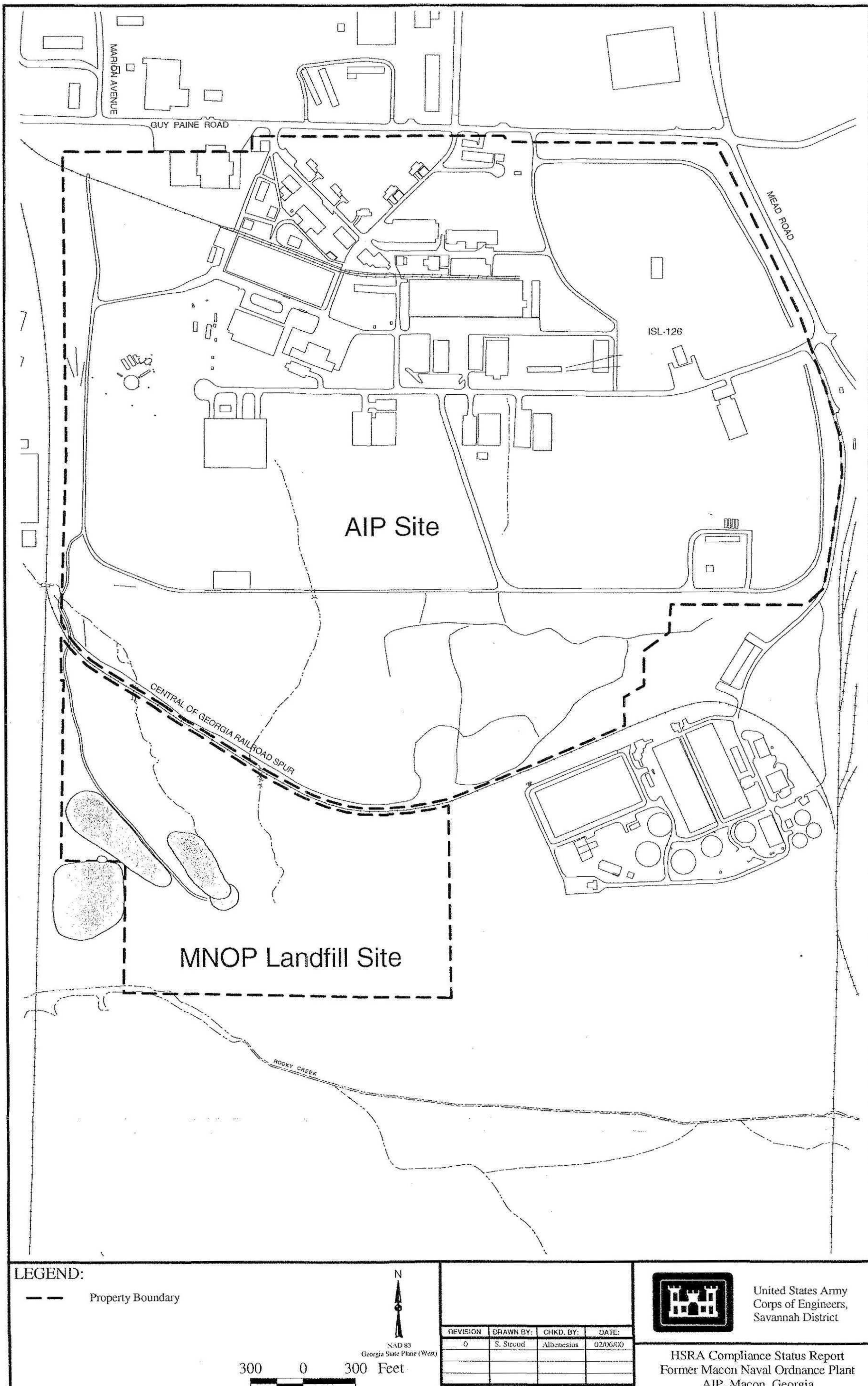

Figure 1-2. Site Map of the Former MNOP

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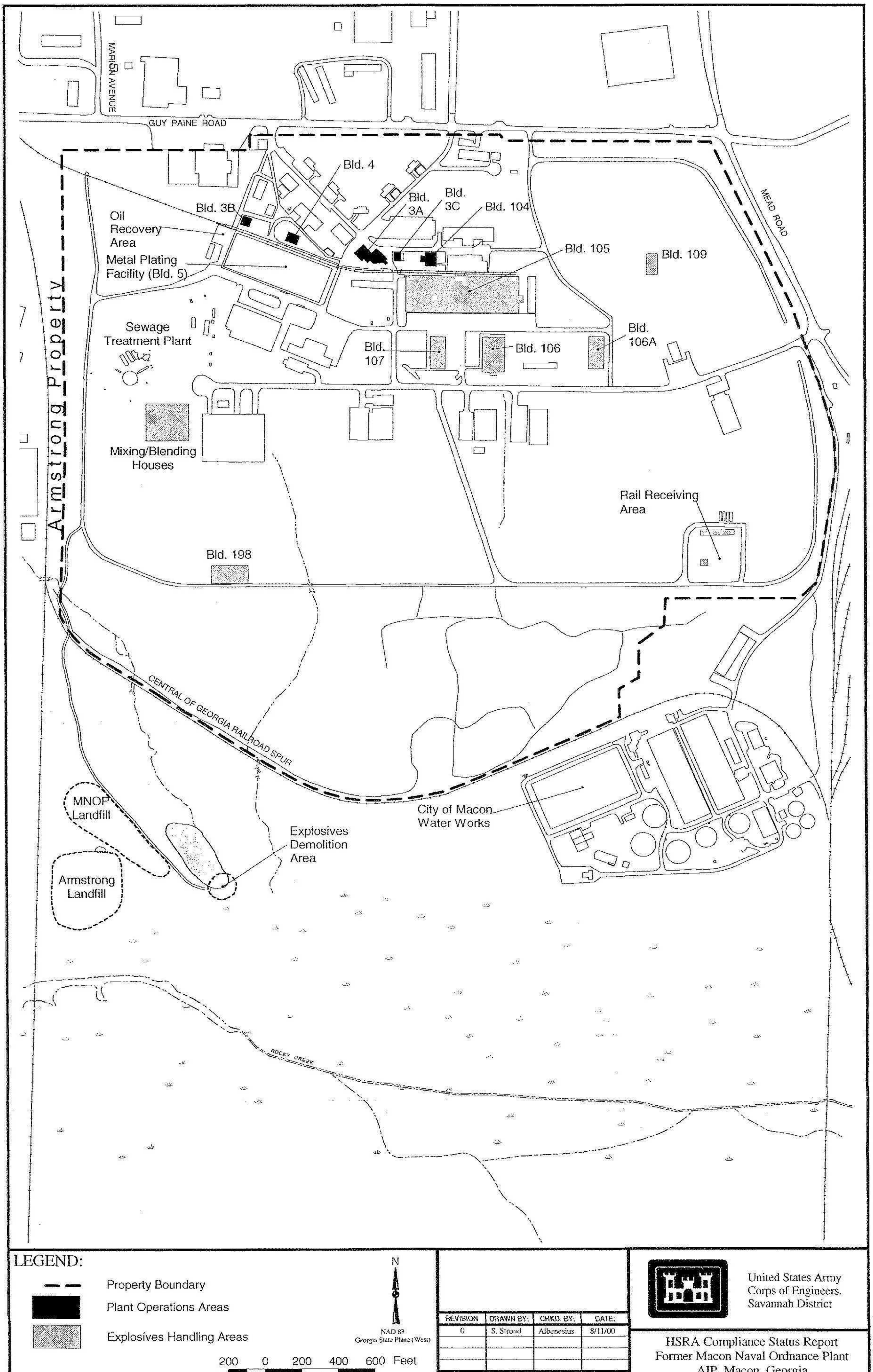

Figure 1-3. Site Map of the Allied Industrial Park

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County Industrial Authority (MBCIA), which also leases buildings as office and warehouse space to various industrial and commercial tenants. Twelve property owners purchased tracts in the industrial park from the MBCIA. The northeast corner of the site has been acquired by the City of Macon for recreational purposes (ballfields and a pool).

The MNOP is bordered to the west and southeast by large industrial facilities, to the north by light industrial facilities, and to the south by the floodplain of Rocky Creek (Figure 1-1). The Rocky Creek Waste Water Treatment Plant, operated by the Macon Water Authority, is located along the southeastern border of the AIP property. The western side of the property is bordered by a railroad track, which separates the site from the Armstrong Cork Company (Armstrong World Industries) plant site. The property to the north of the site is primarily developed by commercial and industrial businesses. The Riverwood International industrial plant borders the site to the east. The Armstrong plant site also is a Class II HSRA site (HSI site number 10131), the Riverwood International site is a Class IV HSRA site (HSI site number 10027).

1.2 Allied Industrial Park History and Previous Investigations

After being declared surplus by the Navy, the MNOP property was sold in December 1965 to the Maxson Electronics Company of New York. Maxson continued to produce ordnance under contract with the Navy. In 1973, Maxson sold the property to Allied Chemical Corporation, which manufactured automobile seat belts at the site. Allied sold the property in 1980 to the MBCIA.

Four environmental sampling events and one research study were conducted at the former MNOP site prior to the investigation reported herein. Beaver Engineering, Environmental Science and Engineering, Inc. (ESE), Westinghouse Environmental and Geotechnical Services, Inc. (WEGS) and Rust E&I (Rust) conducted the four sampling events. Rust also prepared a research report for the site (Rust 1994), but it did not include any environmental sampling. With the exception of the Rust 1996 Site Investigation (Rust 1997), previous sampling events were limited to relatively small, specific areas of the AIP site. In general, the prior studies identified various inorganic and organic constituents in soil and groundwater at the AIP that may be related to past operations.

No specific sources have been identified at the AIP. However, the Rust report (Rust 1994) indicated several areas that could possibly serve as sources due to potential past use. The potential source areas that exist at the AIP are:

- plant operations area

- storm water drain outfalls
- MNOP Sewage Treatment Plant
- MNOP Metal Plating Facility
- above ground storage tanks (ASTs), underground storage tanks (USTs), and oil recovery area
- electric transformers
- explosives storage and handling areas, and
- off-site sources.

The 1996 Rust investigation and the 1998-2000 SAIC investigations focused on the suspected source areas and the resulting data from these two investigations serves as the basis of this compliance status report.

1.2.1 1996 Site Soils Investigation

In the 1996 Site Investigation conducted by Rust (1997), soil samples were collected from 63 direct push technology (DPT) sampling locations within the AIP. The 1996 Rust data were included in the HSRA criteria screenings (Section 4.0) as well as used in the nature and extent discussion. The specific discussion of the 1996 sampling activities can be found in Rust (1997) and summary discussions are provided in SAIC (2000).

The results of soil sampling indicated that trichloroethene (TCE) and trace amounts of other chlorinated organic compounds are present in the soils of the AIP site. These data indicated the highest levels of TCE to be present at locations ISL-4 and ISL-8. Low levels of TCE are also detected in soils throughout the site. Tetrachloroethene (PCE) is also present in the shallow soils at ISL-4. Sample locations are discussed and presented in Section 2.0 of this report.

No definable extent of inorganics contamination was determined from the data collected. Considering the widespread coverage of the sample locations and the limited background soil data collected, elevated levels of inorganics above background appear to be localized and scattered across the property. The most numerous detections of inorganic analytes detected above background occur at sample location ISL-8 and may be associated with the former MNOP sewage treatment plant.

1.2.2 Allied Industrial Park Groundwater Monitoring

In the 1996 Site Investigation conducted by Rust (1997), a total of 60 DPT groundwater samples were collected from across the AIP. These data were incorporated into the HSRA report as appropriate. The specific 1996 sample locations are discussed in Section 2.0.

The extent of groundwater contamination was described by Rust in the 1996 Site Investigation (Rust 1997). The primary constituents detected included: TCE, cadmium, chromium, lead, and nickel. Additional analytes were detected, but were not considered to be significant. TCE was the only compound which appeared to have had a significant impact to groundwater quality and a clearly defined plume was present when TCE concentrations were mapped. TCE was detected in 28 of the 60 collected groundwater samples and varied widely in concentration from 0.0018 mg/L to 62 mg/L. The highest concentrations of TCE were detected along the west and southwest portions of the site.

The presence of metal analytes was thought to be partly due to turbidity in the collected samples. Groundwater analyses included numerous detections of the targeted inorganic analytes. Concentrations of cadmium, chromium, nickel and lead were reported to be variable across the site and displayed no distinct trends with respect to the identified source areas. Further, because of the presence of each of these constituents in the background sample points (IGW-61, IGW-62, IGW-18, IGW-19) at similar concentrations, Rust proposed that all four of these analytes may have been present as a result of turbidity rather than as a dissolved species in groundwater. The specific discussion of the 1996 groundwater sampling activities can be found in Rust (1997) and summary discussions are provided in SAIC (2000).

1.3 Project Objectives

The project objectives for the AIP investigation were defined primarily by HSRA. Namely, the objectives are:

- Document all of the field activities and analytical results from the current AIP investigation.
- Determine the horizontal and vertical extent of contamination at the AIP.
- Determine whether site contaminants constitute a threat to human health or the environment.
- Establish the compliance status of the AIP via the HSRA screening process.
- Determine the need for future actions and/or no further action; and,

- Gather necessary data to support development of a Corrective Action Plan(s) (CAP), if warranted.

1.4 Project Scope

The scope of the HSRA investigation at the AIP was as follows:

- Sample local production wells
- Collect stratigraphic and hydrogeologic information from test borings
- Conduct a soil gas survey
- Collect surface and subsurface soil samples
- Install groundwater monitoring wells
- Sample new and existing groundwater monitoring wells
- Perform slug tests
- Collect surface water and sediment from drainage features on the AIP
- Compile and evaluate all of the collected data in the CSR.

The environmental sampling activities performed during 1998 through 2000 are fully described in Section 2.0 (Field Investigation) and Section 3.0 (Hydrogeologic Results). Data and interpretation relative to the HSRA criteria is presented in Section 4.0 (Nature and Extent of Contamination).

2.0 FIELD INVESTIGATION

This section documents the field activities completed at the AIP during the 1998 through 2000 period. During this time period, SAIC collected surface and subsurface soil samples, surface water, sediment, and groundwater samples from the AIP. Additionally, continuous coring was conducted to characterize the subsurface geology and groundwater monitoring wells were installed to better characterize the site hydrogeology. All of the field activities were documented in field notebooks (Appendix A). The various aspects of the field investigation are discussed in the following subsections. Where appropriate, the types and locations of 1996 Rust samples will be referenced. However, specific discussion of sampling techniques and activities performed by Rust are not reiterated here, but can be found in Rust (1997).

2.1 Geological Investigation

During 1998, SAIC conducted continuous coring at 10 locations across the former MNOP (AIP and Landfill). Seven of these were within the AIP and three were within the MNOP Landfill (Figure 2-1). Each of these coreholes was designed to reach the base of the unconfined aquifer and to attempt to characterize the subsurface down to the top of the regionally significant Tuscaloosa aquifer. Coring operations were conducted from 3/17/98 through 3/25/98. Total depths ranged from 50 ft below land surface (bls) at MW-2B to 155 ft bls at CH-2.

Coring was accomplished using Rotosonic™ drilling methods. Rotosonic™ drilling is performed by using a dual cased drilling system that employs high frequency mechanical vibration to advance the hole and to collect continuous core samples. During drilling or coring, a temporary outer steel casing is advanced through vibration and is not removed from the hole until the well is installed or the hole is abandoned. The temporary steel casing serves to maintain the borehole integrity and to protect against cross-contamination within the aquifer while drilling. Because the temporary casing also serves to keep the borehole from collapsing, drilling mud is not generally used. In most cases, potable water is sufficient to bring the cuttings to land surface. However, on some occasions, a small amount of Quikgel™ drilling mud is used to assist in removing very coarse-grained or indurated sediments from the borehole.

Continuous geologic cores were obtained at each of the ten corehole locations. The 4 in. cores were extruded directly from the core barrel into plastic sleeves, which were knotted at the basal end of the core. The cores were then examined and described in the field by a geologist. Field geologic logs are included in Appendix C. The core samples were quartered, and a quarter section was wrapped

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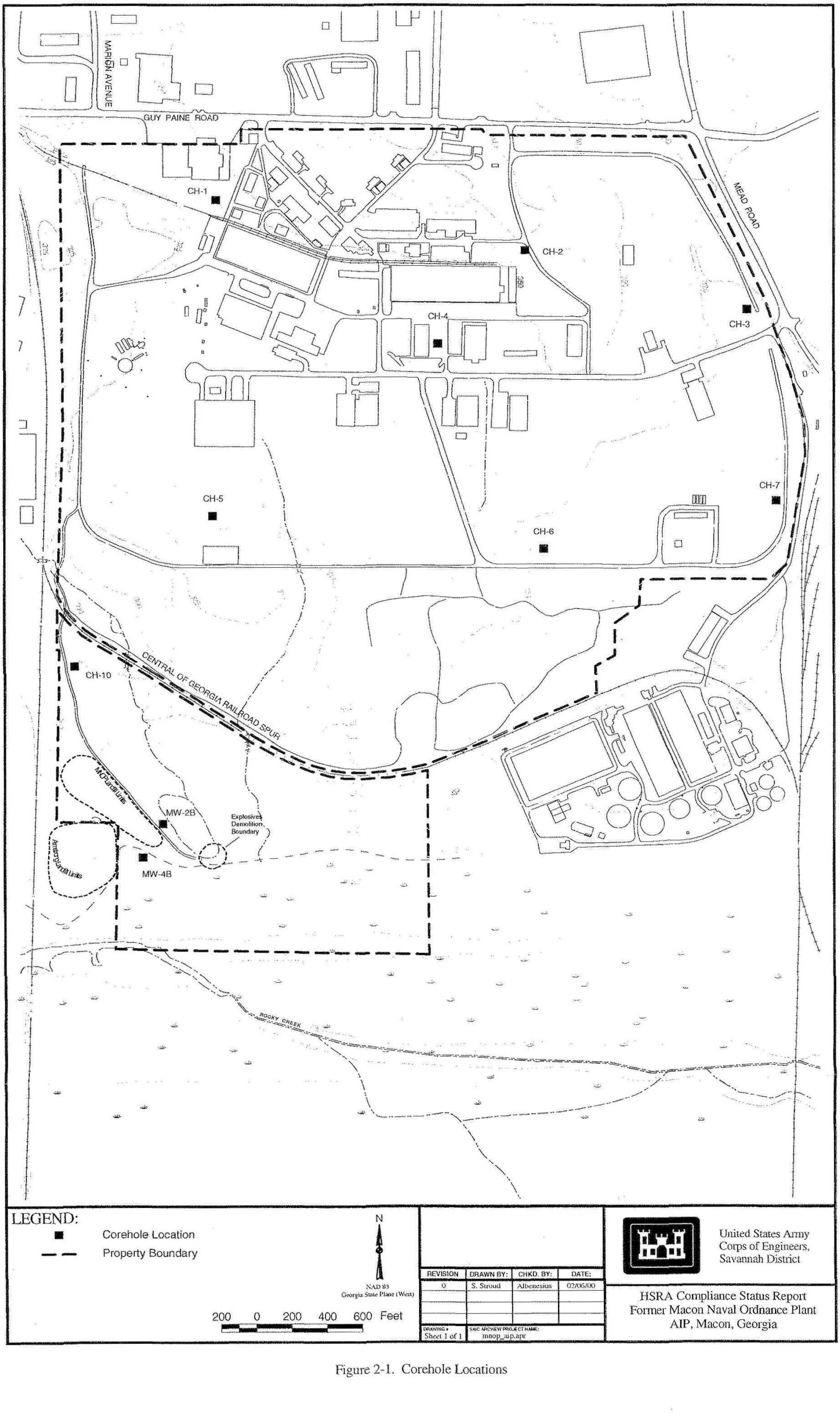

Figure 2-1. Corehole Locations

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in plastic and placed in water-resistant boxes. The boxes were labeled in the field to designate the corehole number, run number, depth of each run, and percent recovery. These samples were then archived in a vacant building at the AIP used as the staging area for the 1998 investigation. The remaining ¾ portion of the core was discarded as IDW.

At the AIP, samples of clayey material were taken from core CH-6, sealed in plastic sleeves, and sent to a geotechnical laboratory for permeability analysis. Material from landfill cores CH-10 and MW-4B was also analyzed for permeability.

2.2 Soil Gas Survey

An extensive soil gas survey was originally planned for the investigation at the AIP with the installation of up to 150 collectors. During the planning for the soil gas survey, it was decided that a phased approach should be used, beginning with a control phase, followed by up to two investigatory phases. The purpose of the control phase was to place the collectors at points that had previously been sampled for soil, varying the locations from spots of gross soil contamination to spots previously shown to be clean, to attempt to duplicate the previous results.

Collectors were provided by Quadrel Services Inc. of Clarksburg, Maryland. The Quadrel method of soil gas surveying bears the name EMFLUX™. It consists of small glass tubes, filled with filter material, that are buried just a few inches below ground and left for a minimum of 72 hours prior to retrieval and analysis.

For the control phase, 18 collectors were installed at locations within the AIP on March 06, 1998. At the AIP, collectors were labeled ISG-1 through ISG-18. They were installed at previously sampled locations. The 18 AIP collectors were retrieved on March 11, 1998. The soil gas collectors were shipped for analysis on the same day as retrieval. Soil gas sampling results were inconclusive. A similar control phase conducted at the Landfill also yielded inconclusive results. Since the control phase investigation was a failure, a decision was therefore made to discontinue the soil gas investigation.

2.3 Soil Sampling

2.3.1 1996 Soil Sampling

During the 1996 Site Investigation conducted by Rust (1997), soil samples were collected from 63 DPT sampling locations (ISL-1 through ISL-63) within the AIP. These locations are mapped on

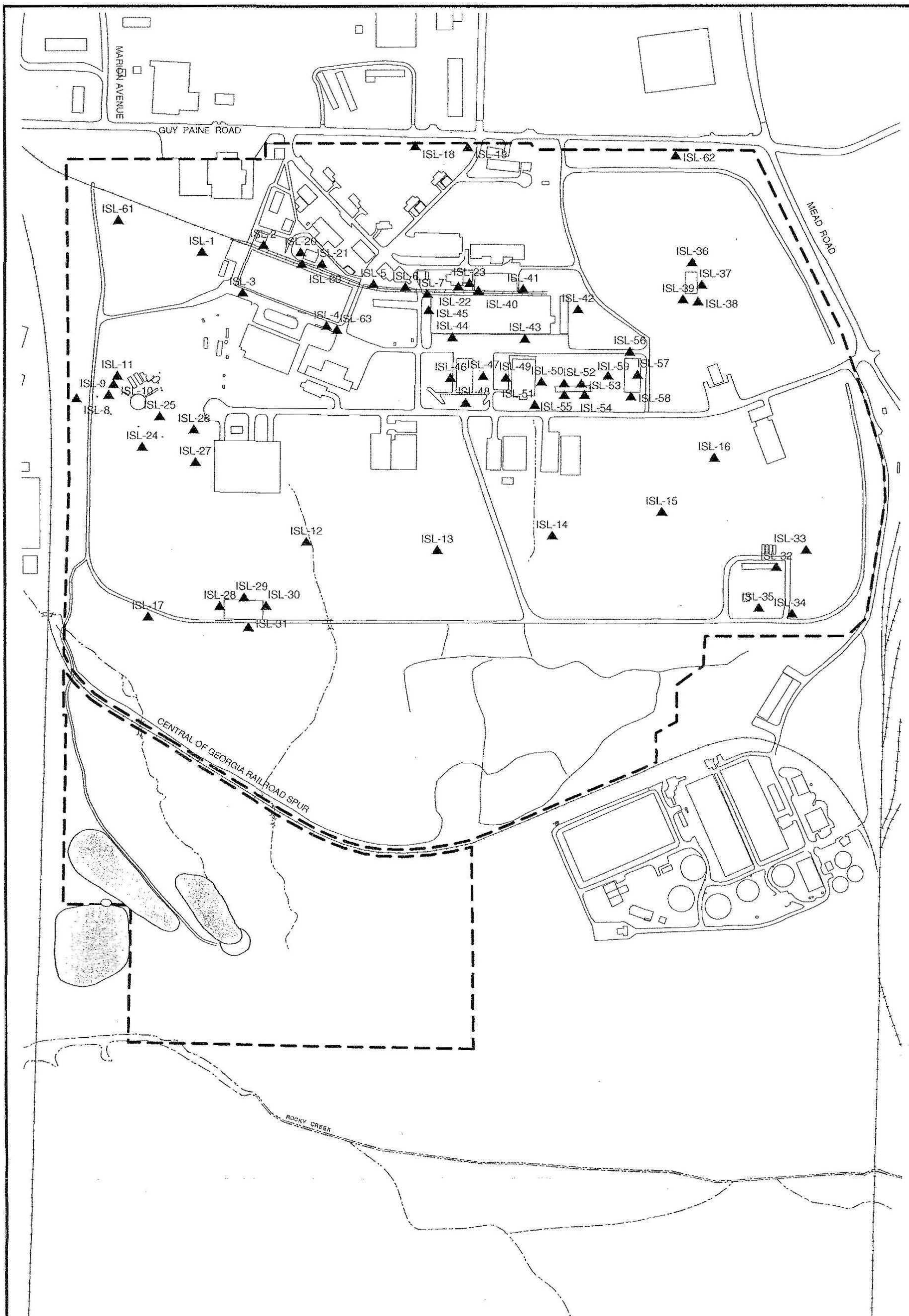
Figure 2-2. These samples were collected in the vicinity of suspected source areas. A surface soil sample was collected from 0 to 2 ft bls at each location. Additionally, one sample from a deeper interval was also collected, with the specific depth interval determined by field screening procedures. Samples were analyzed for volatile organic compounds (VOCs) (Environmental Protection Agency [EPA] method 8260), semivolatile organic compounds (SVOCs) (EPA method 8270), pesticides/polychlorinated biphenyls (PCBs) (EPA method 8080), priority pollutant (pp) metals (EPA methods 6010, 7060, 7421, 7740) and explosives (EPA 8330). Summary tables of Rust 1996 soil data are provided in Appendix O. All of the detections in this soil data set were included in the HSRA screening for the AIP and are referenced where appropriate in the nature and extent discussions provided in Section 4.0.

2.3.2 1998 and 2000 Soil Sampling

The more recent soil sampling included locations ISL-64 through ISL-126 (collected in 1998), ISL-127 and ISL-128 (collected in 1999 to replace ISL-113 and ISL-114 which had unknown coordinates), and ISL-201 through ISL-211 (collected in 2000). Sample locations are depicted on Figure 2-3. Table 2-1 summarizes soil sampling information for the 1998 and 1999 field activities. Table 2-2 summarizes the soil sampling for the 2000 field activities. The sample collection and handling followed the procedures specified in the workplan (SAIC 2000) and Quality Assurance Project Plan (QAPP) (SAIC 2000) and included full documentation of activities, calibrations, and chain of custody for each sample. Much of the sample collection and handling details are described in the field log books (Appendix A). The chain of custody record is maintained in the project file. Information on sample handling, preservation, and analyses is also specified in the Quality Control Summary Report (QCSR) (Appendix M).

Analytical results for the 1998 and 2000 soil sampling appear in Appendix N (raw validated data) and Appendix O (summary tables).

Based on the Rust (1997) investigation results, the analytical suites for soil were narrowed to focus on those components that appeared significant. Thus, for the 1998 sampling, all surface soil locations were analyzed for VOCs (EPA Method 8260) while only selected surface locations were analyzed for SVOCs (EPA Method 8270). The 1998 subsurface soil intervals were only analyzed for VOCs. No metals analyses were performed on any of the soil samples. For the 2000 sampling, which was intended to clearly define the VOC plume and locate possible source areas, only VOCs were analyzed.



LEGEND:

- ▲ SAIC CPT Location
- ▲ Rust CPT Location
- ● Rust Monitoring Well
- ● SAIC Monitoring Well
- — — Property Boundary

N

NAD 83
Georgia State Plane (West)

300 0 300 Feet

REVISION	DRAWN BY:	CHKD. BY:	DATE:
0	S. Stroud	Albenesius	08/14/00

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SAIC ARCVIEW PROJECT NAME: mnop_lf.apr

United States Army
Corps of Engineers,
Savannah District

HSRA Compliance Status Report
Former Macon Naval Ordnance Plant
AIP, Macon, Georgia

Figure 2-2. Rust Soil DPT Locations

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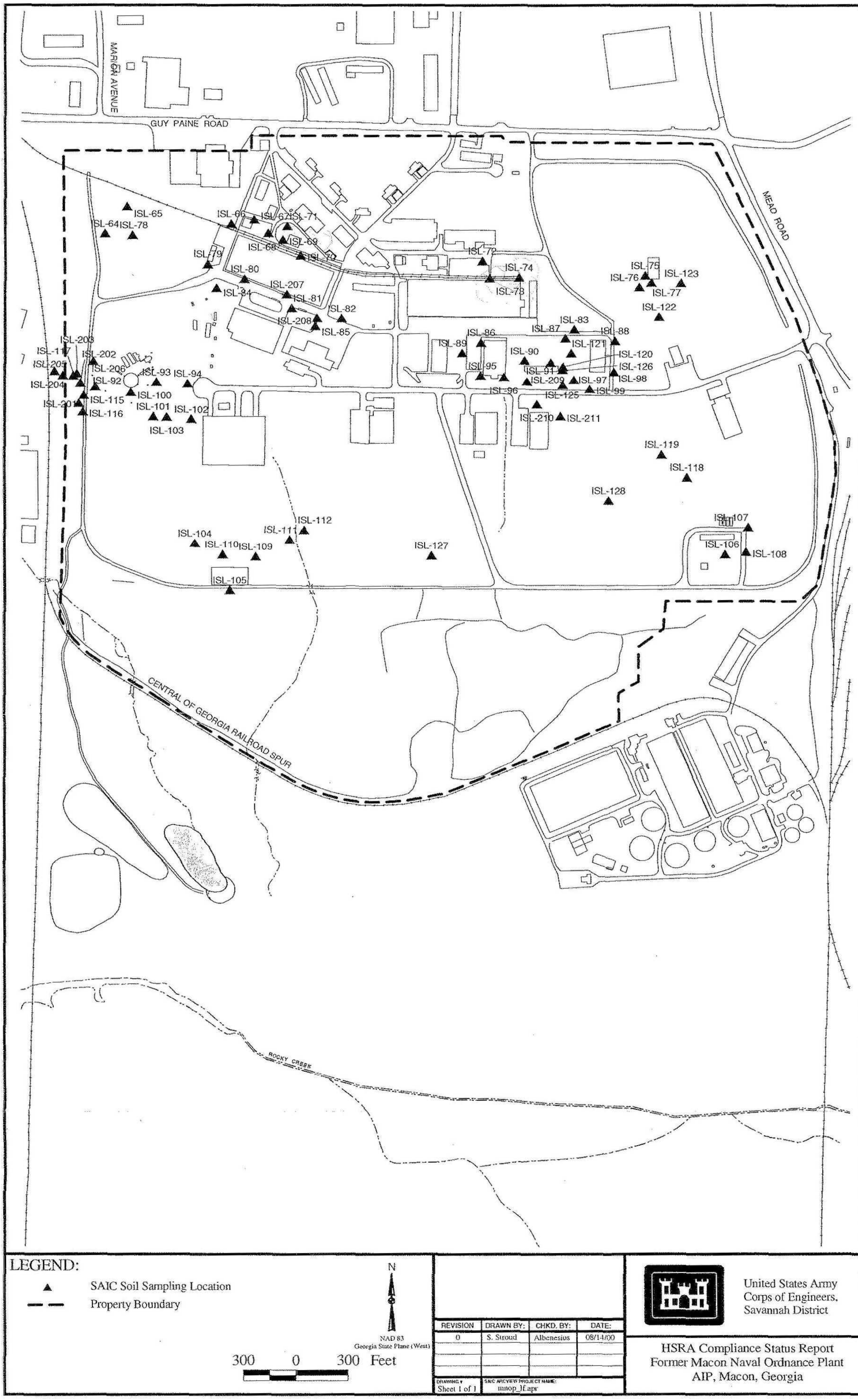

Figure 2-3. SAIC Soil Sampling Locations

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Table 2-1. Summary of 1998 and 1999 Soil Sampling Allied Industrial Park Former Macon Naval Ordnance Plant (Continued)

Sample Number	Date Collected	Sample Interval	Sample Type	Comment	Analyte Suite
ISL-64	05/12/1998	0-1	Soil	Hand Auger	1
ISL-65	05/12/1998	0-1	Soil	Hand Auger	1
ISL-66	05/13/1998	0-1	Soil	Hand Auger	1
ISL-66-A	05/13/1998	0-1	Duplicate		1
ISL-67	05/13/1998	0-1	Soil	Hand Auger	1
ISL-68	05/13/1998	0-1	Soil	Hand Auger	1
ISL-69	05/13/1998	0-1	Soil	Hand Auger	1, 2
ISL-69-A	05/13/1998	0-1	Duplicate		1, 2
ISL-70	05/13/1998	0-1	Soil	Hand Auger	1, 2
ISL-71	05/13/1998	0-1	Soil	Hand Auger	1, 2
ISL-72	05/14/1998	0-1	Soil	Hand Auger	1, 2
ISL-73	05/14/1998	0-1	Soil	Hand Auger	1, 2
ISL-74	05/14/1998	0-1	Soil	Hand Auger	1, 2
ISL-74-A	05/14/1998	0-1	Duplicate		1
ISL-75	05/14/1998	0-1	Soil	Hand Auger	1
ISL-76	05/14/1998	0-1	Soil	Hand Auger	1
ISL-77	05/14/1998	0-1	Soil	Hand Auger	1
ISL-77-A	05/14/1998	0-1	Duplicate		1
ISL-78	05/12/1998	0-1	Soil	Hand Auger	1
ISL-79	05/13/1998	0-1	Soil	Hand Auger	1
ISL-80	05/13/1998	0-1	Soil	Hand Auger	1
ISL-80-R	05/13/1998	--	Rinsate		1
ISL-80-TB	05/13/1998	--	Trip Blank		1
ISL-81	05/13/1998	0-1	Soil	Hand Auger	1, 2
ISL-82	05/13/1998	0-1	Soil	Hand Auger	1
ISL-83	05/14/1998	0-1	Soil	Hand Auger	1
ISL-84	05/13/1998	0-1	Soil	Hand Auger	1
ISL-85	05/13/1998	0-1	Soil	Hand Auger	1
ISL-86	05/14/1998	0-1	Soil	Hand Auger	1
ISL-87	05/15/1998	0-1	Soil	Hand Auger	1
ISL-88	05/14/1998	0-1	Soil	Hand Auger	1
ISL-89	05/14/1998	0-1	Soil	Hand Auger	1, 2
ISL-90	05/14/1998	0-1	Soil	Hand Auger	1
ISL-91	05/14/1998	0-1	Soil	Hand Auger	1
ISL-92	05/12/1998	0-1	Soil	Hand Auger	1
ISL-93	05/12/1998	0-1	Soil	Hand Auger	1
ISL-94	05/13/1998	0-1	Soil	Hand Auger	1
ISL-95	05/14/1998	0-1	Soil	Hand Auger	1
ISL-96	05/14/1998	0-1	Soil	Hand Auger	1
ISL-97	05/15/1998	0-1	Soil	Hand Auger	1
ISL-98	05/15/1998	0-1	Soil	Hand Auger	1
ISL-99	05/15/1998	0-1	Soil	Hand Auger	1
ISL-100	05/12/1998	0-1	Soil	Hand Auger	1
ISL-101	05/12/1998	0-1	Soil	Hand Auger	1
ISL-102	05/13/1998	0-1	Soil	Hand Auger	1
ISL-103	05/12/1998	0-1	Soil	Hand Auger	1
ISL-104	05/12/1998	0-1	Soil	Hand Auger	1
ISL-105	05/12/1998	0-1	Soil	Hand Auger	1
ISL-105A	05/12/1998	0-1	Duplicate	Hand Auger	1
ISL-106	05/19/1998	0-1	Soil	Hand Auger	1
ISL-107	05/15/1998	0-1	Soil	Hand Auger	1
ISL-108	05/15/1998	0-1	Soil	Hand Auger	1
ISL-109-01	06/09/1998	0-2	Soil	Drilled Boring	1
ISL-109-02	06/09/1998	24-26	Soil	Drilled Boring	1
ISL-109-03	06/09/1998	36-38	Soil	Drilled Boring	1
ISL-110-01	06/08/1998	0-2	Soil	Drilled Boring	1
ISL-110-02	06/08/1998	14-16	Soil	Drilled Boring	1

Table 2-1. Summary of 1998 and 1999 Soil Sampling
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample Number	Date Collected	Sample Interval	Sample Type	Comment	Analyte Suite
ISL-110-03	06/08/1998	36-38	Soil	Drilled Boring	1
ISL-111-01	06/09/1998	0-2	Soil	Drilled Boring	1
ISL-111-02	06/09/1998	12-14	Soil	Drilled Boring	1
ISL-111-03	06/09/1998	28--30	Soil	Drilled Boring	1
ISL-112-01	06/09/1998	0-2	Soil	Drilled Boring	1
ISL-112-02	06/09/1998	14-16	Soil	Drilled Boring	1
ISL-112-03	06/09/1998	30-32	Soil	Drilled Boring	1
ISL-113	05/13/1998	--	Soil	Unknown coordinates - do not use	1, 2
ISL-114	05/14/1998	--	Soil	Unknown coordinates - do not use	1, 2
ISL-115-01	06/08/1998	0-2	Soil	Drilled Boring	1
ISL-115-01-A	06/08/1998	0-2	Duplicate	Drilled Boring	1
ISL-115-02	06/08/1998	8-10	Soil	Drilled Boring	1
ISL-115-03	06/08/1998	16-18	Soil	Drilled Boring	1
ISL-116-01	06/08/1998	0-2	Soil	Drilled Boring	1
ISL-116-01-A	06/08/1998	0-2	Duplicate	Drilled Boring	1
ISL-116-02	06/08/1998	6-8	Soil	Drilled Boring	1
ISL-116-03	06/08/1998	26-28	Soil	Drilled Boring	1
ISL-117-01	06/05/1998	0-2	Soil	Drilled Boring	1
ISL-117-01-A	06/05/1998	0-2	Duplicate	Drilled Boring	1
ISL-117-02	06/05/1998	4-6	Soil	Drilled Boring	1
ISL-117-03	06/05/1998	6-8	Soil	Drilled Boring	1
ISL-118-01	06/10/1998	0-2	Soil	Drilled Boring	1
ISL-118-02	06/10/1998	10-12	Soil	Drilled Boring	1
ISL-118-03	06/10/1998	20-22	Soil	Drilled Boring	1
ISL-119-01	06/10/1998	0-2	Soil	Drilled Boring	1
ISL-119-01-R	06/10/1998	--	Rinsate		1
ISL-119-01-TB	06/10/1998	--	Trip Blank		1
ISL-119-02	06/10/1998	10-12	Soil	Drilled Boring	1
ISL-119-03	06/10/1998	22-24	Soil	Drilled Boring	1
ISL-120-01	06/10/1998	0-2	Soil	Drilled Boring	1
ISL-120-02	06/10/1998	2-4	Soil	Drilled Boring	1
ISL-120-03	06/10/1998	28-30	Soil	Drilled Boring	1
ISL-121-01	06/04/1998	0-2	Soil	Drilled Boring	1
ISL-121-02	06/04/1998	20-22	Soil	Drilled Boring	1
ISL-121-03	06/04/1998	36-38	Soil	Drilled Boring	1
ISL-121-03-A	06/04/1998	36-38	Duplicate	Drilled Boring	1
ISL-122-01	06/03/1998	0-2.5	Soil	Drilled Boring	1
ISL-122-02	06/03/1998	20-22	Soil	Drilled Boring	1
ISL-122-03	06/03/1998	40-42	Soil	Drilled Boring	1
ISL-123-01	06/02/1998	0-2	Soil	Drilled Boring	1
ISL-123-02	06/02/1998	9-11.5	Soil	Drilled Boring	1
ISL-123-03	06/02/1998	24-26.5	Soil	Drilled Boring	1
ISL-125-01	06/02/1998	0-2.5	Soil	Drilled Boring	1
ISL-125-02	06/02/1998	6.5-9	Soil	Drilled Boring	1
ISL-125-03	06/02/1998	39-31.5	Soil	Drilled Boring	1
ISL-126-01	06/04/1998	0-2	Soil	Drilled Boring	1,2
ISL-126-01-A	06/04/1998	0-2	Duplicate	Drilled Boring	1,2
ISL-126-02	06/04/1998	10-12	Soil	Drilled Boring	1
ISL-126-03	06/04/1998	34-36	Soil	Drilled Boring	1
ISL-127	03/17/1999	0-1	Soil	Hand Auger	1, 2
ISL-128	03/17/1999	0-1	Soil	Hand Auger	1, 2
TRIP BLANK	03/16/1999	--	Trip Blank		1

Analytical Suite
1 = VOCs (EPA 8260)
2 = SVOCs (EPA 8270)

Table 2-2. Summary of 2000 Soil Sampling
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sampling Location Identifier	Date Collected	Sample Interval	Sample Type	Comment	Analyte Suite
ISL-201-01	03/06/00	0-2	Soil	Hand Auger; Area surrounding ISL-117	1
ISL-201-01B	03/06/00	0-2	Split	Hand Auger; Area surrounding ISL-118	1
ISL-201-02	03/06/00	2-4	Soil	Hand Auger; Area surrounding ISL-119	1
ISL-201-03	03/06/00	4-6	Soil	Hand Auger; Area surrounding ISL-120	1
ISL-201-04	03/06/00	6-8	Soil	Hand Auger; Area surrounding ISL-121	1
ISL-201-05	03/06/00	8-10	Soil	Hand Auger; Area surrounding ISL-122	1
ISL-202-01	03/06/00	0-2	Soil	Hand Auger; Area surrounding ISL-123	1
ISL-202-02	03/06/00	2-4	Soil	Hand Auger; Area surrounding ISL-124	1
ISL-202-02C	03/06/00	2-4	Rinsate	Hand Auger; Area surrounding ISL-125	1
ISL-202-03	03/06/00	4-6	Soil	Hand Auger; Area surrounding ISL-126	1
ISL-202-03A	03/06/00	4-6	Duplicate	Hand Auger; Area surrounding ISL-127	1
ISL-202-04	03/06/00	6-8	Soil	Hand Auger; Area surrounding ISL-128	1
ISL-202-05	03/06/00	8-10	Soil	Hand Auger; Area surrounding ISL-129	1
ISL-203-01	03/07/00	0-2	Soil	Hand Auger; Area surrounding ISL-130	1
ISL-203-02	03/07/00	2-4	Soil	Hand Auger; Area surrounding ISL-131	1
ISL-203-03	03/07/00	4-6	Soil	Hand Auger; Area surrounding ISL-132	1
ISL-204-01	05/22/00	0-2	Soil	Hand Auger; Area surrounding ISL-133	1
ISL-204-02	05/22/00	2-4	Soil	Hand Auger; Area surrounding ISL-134	1
ISL-204-03	05/22/00	4-6	Soil	Hand Auger; Area surrounding ISL-135	1
ISL-205-01	05/22/00	0-2	Soil	Hand Auger; Area surrounding ISL-136	1
ISL-205-02	05/22/00	2-4	Soil	Hand Auger; Area surrounding ISL-137	1
ISL-206-01	03/07/00	0-2	Soil	Hand Auger; Area surrounding ISL-138	1
ISL-206-02	03/07/00	2-4	Soil	Hand Auger; Area surrounding ISL-139	1
ISL-206-03	03/07/00	4-6	Soil	Hand Auger; Area surrounding ISL-140	1
ISL-206-04	03/07/00	6-8	Soil	Hand Auger; Area surrounding ISL-141	1
ISL-206-05	03/07/00	8-10	Soil	Hand Auger; Area surrounding ISL-142	1
ISL-206-05A	03/07/00	8-10	Duplicate	Hand Auger; Area surrounding ISL-143	1
ISL-207-01	03/07/00	0-2	Soil	Hand Auger; On Johns Mansville Property	1
ISL-207-02	03/07/00	2-4	Soil	Hand Auger; On Johns Mansville Property	1
ISL-207-02A	03/07/00	2-4	Duplicate	Hand Auger; On Johns Mansville Property	1
ISL-207-03	03/07/00	4-6	Soil	Hand Auger; On Johns Mansville Property	1
ISL-207-04	03/07/00	6-8	Soil	Hand Auger; On Johns Mansville Property	1
ISL-208-01	03/08/00	0-2	Soil	Hand Auger; On Johns Mansville Property	1
ISL-208-02	03/08/00	2-4	Soil	Hand Auger; On Johns Mansville Property	1
ISL-208-03	03/08/00	4-6	Soil	Hand Auger; On Johns Mansville Property	1
ISL-208-03B	03/08/00	4-6	Split	Hand Auger; On Johns Mansville Property	1
ISL-208-04	03/08/00	6-8	Soil	Hand Auger; On Johns Mansville Property	1
ISL-209-01	03/08/00	0-2	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-209-01B	03/08/00	0-2	Split	Hand Auger; On PB&S Chemical Properties	1
ISL-209-02	03/08/00	2-4	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-209-03	03/08/00	4-6	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-209-04	03/08/00	6-8	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-210-01	05/22/00	0-2	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-210-01C	05/22/00	0-2	Rinsate	Hand Auger; On PB&S Chemical Properties	1
ISL-210-02	05/22/00	2-4	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-210-02A	05/22/00	2-4	Duplicate	Hand Auger; On PB&S Chemical Properties	1
ISL-210-03	05/22/00	4-6	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-210-04	05/22/00	6-8	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-211-01	05/22/00	0-2	Soil	Hand Auger; On PB&S Chemical Properties	1
ISL-211-01B	05/22/00	0-2	Split	Hand Auger; On PB&S Chemical Properties	1
ISL-211-02	05/22/00	2-4	Soil	Hand Auger; On PB&S Chemical Properties	1
TB-001	03/06/00		Trip Blank		1
TB-003	05/22/00		Trip Blank		1
TB-004	05/22/00		Trip Blank		1

Analyte Suite
1 = VOCs (EPA 8260)

2.3.2.1 Surface Soil Sampling

Surface soil samples were collected via hand augering from several stations across the AIP during the period of 5/19/98 to 5/20/98. A stainless steel bucket-type auger was used for all hand augering activities. Locations sampled included ISL-64 through ISL-108 (0 to 1.0 ft bls) as well as ISL-127 and ISL-128 (0 to 1.0 ft bls). Locations ISL-113 and ISL-114 were not correctly surveyed and their exact location is unknown. Thus, results from these two sampling events were not included in the report. Replacement samples were collected during 1999 and were labeled as sample locations ISL-127 and ISL-128. Hand augering was also used during 2000 to collect surface interval samples from locations ISL-201 through ISL-211 (0 to 2 ft bls).

The remaining surface soil samples (ISL-109 through ISL-126) were collected via hollow stem augering with a split spoon and generally encompassed the 0 to 2 ft soil interval. Drilling logs for these sampling stations are provided in Appendix B. All sample locations are shown on Figure 2-3.

Monitoring of the breathing zone, and sample headspace monitoring for VOCs using a photoionization detector (PID) was conducted during all soil sampling activities. Table 2-1 provides a summary of surface soil sampling information.

2.3.2.2 Subsurface Soil Sampling

Subsurface soil samples were collected using hollow stem augering and also via hand augering. During 1998, locations ISL-109 through ISL-126 were sampled via hollow stem augering. The depth interval of the samples were determined by field screening. A specific summary of sample IDs and associated information is provided in Table 2-1. All samples were analyzed for VOCs. Specific logs for these drilled cores are provided as Appendix B. Locations ISL-113 and ISL-114 were not correctly surveyed and their exact location is unknown. Thus, results from these two sampling events were not included in the report. Replacement samples were collected during 1999 and were labeled as sample locations ISL-127 and ISL-128.

During 2000, locations ISL-021 through ISL-211 were sampled via hand auger. Where practical, the 2 to 4 ft bls, 4 to 6 ft bls, and 6 to 8 ft bls soil intervals were sampled. A specific summary of the sample IDs and intervals is provided in Table 2-2. All of the 2000 samples were analyzed for VOCs.

2.3.2.3 Quality Assurance/Quality Control (QA/QC) Samples for Soil

As dictated by the AIP workplan (SAIC 2000), during each sampling event an appropriate number of duplicate, rinsate, and split samples were collected. Sample IDs for QA soil samples are provided in Table 2-1 and Table 2-2. The specific sample IDs and results for these samples are discussed in the QCSR (Appendix M). Sample specific results for all data (including QA/QC samples) are contained in Appendix N.

2.3.2.4 Background Soil Locations

Based upon the review of the sample locations and available data, background soil was selected as Rust sample locations ISL-18, ISL-19, ISL-61, and ISL-62 (Figure 2-2). These locations are upgradient of the existing plume and industrial concerns of the AIP. The average concentration of detected constituents was used where needed in the HSRA standard derivations. Specific background results are detailed in Section 4.0.

2.4 Groundwater Sampling

2.4.1 1996 Investigation Data

AIP groundwater collected in the 1996 investigation consisted of 60 DPT samples and six piezometer samples (Figure 2-4). Detections from this sampling event were included in the HSRA screening and nature and extent discussions provided in subsequent sections. A summary of 1996 groundwater data is provided in Appendix O. There is uncertainty surrounding the DPT groundwater samples from 1996 since they may reflect elevated metal concentrations due to turbid samples. Thus, the more recent 1998 and 2000 groundwater monitoring results from established wells may be more indicative of local groundwater conditions.

2.4.2 1998 and 2000 Investigation Data

The 1998 and 2000 groundwater data were collected from existing piezometers, new groundwater wells, cone penetrometer test (CPT) locations, and local production wells (Figure 2-5). The groundwater sampling activities are summarized on Table 2-3 (1998) and Table 2-4 (2000). Analytical data for the groundwater sampling events are provided in Appendix N (raw validated data) and Appendix O (summary tables). Specific information regarding well installation and groundwater sampling is provided below.

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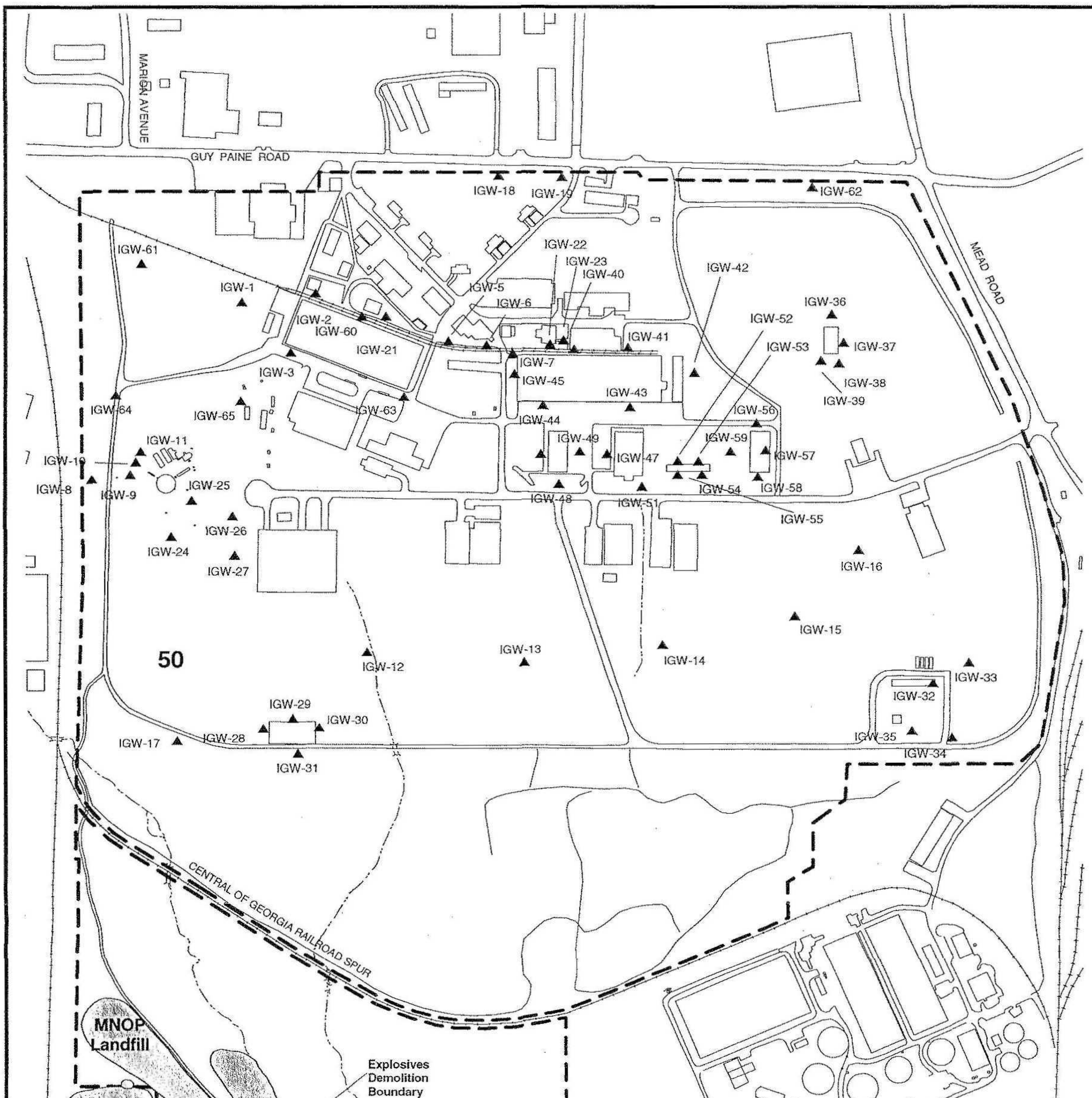

Figure 2-4. Rust Groundwater DPT Locations

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LEGEND:

- ▲ SAIC CPT Location
- ▲ Rust CPT Location
- ● Rust Monitoring Well
- ● SAIC Monitoring Well
- — — Property Boundary

N

NAD 83
Georgia State Plane (West)

300 0 300 Feet

REVISION	DRAWN BY:	CHKD. BY:	DATE:
0	S. Stroud	Albenesius	08/14/00

DRAWING #: Sheet 1 of 1
SAIC ARCVIEW PROJECT NAME: mnop_lf.apr

United States Army
Corps of Engineers,
Savannah District

HSRA Compliance Status Report
Former Macon Naval Ordnance Plant
AIP, Macon, Georgia

Figure 2-5. SAIC Groundwater Sampling Locations

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Table 2-3. Summary of 1998 Groundwater Sampling Allied Industrial Park Former Macon Naval Ordnance Plant

Sample Number	Date Collected	Sample Type	Sample Technique	Comment	Analyte Suite
A1PMW-ER	11/12/1998	Rinsate	--		1
A1PMW-TRIP7	10/22/1998	Trip Blank	--		1
AIPMW-TRIP 1	10/22/1998	Trip Blank	--		1
AIPMW-TRIP2	10/22/1998	Trip Blank	--		1
AIPMW-TRIP3	10/22/1998	Trip Blank	--		1
AIPMW-TRIP4	10/22/1998	Trip Blank	--		1
AIPMW-TRIP5	11/06/1998	Trip Blank	--		1
AIPMW-TRIP6	10/22/1998	Trip Blank	--		1
AWL-6	06/12/1998	Groundwater	Well	Production Well	1
GHW-1	06/12/1998	Groundwater	Well	GA Hydrate Production Well	1
IGW-100	04/27/1998	Groundwater	CPT	55 ft	2
IGW-66	04/28/1998	Groundwater	CPT	55 ft	2
IGW-67-01	04/23/1998	Groundwater	CPT	55 ft	1
IGW-67-02	04/23/1998	Groundwater	CPT	98 ft	1
IGW-70	04/28/1998	Groundwater	CPT	45 ft	1
IGW-72-01	04/16/1998	Groundwater	CPT	58 ft	1
IGW-72-01A	04/16/1998	Duplicate	CPT	58 ft	1
IGW-72-01-SP	04/16/1998	Split	CPT	58 ft	1
IGW-73-01	04/16/1998	Groundwater	CPT	32 ft	1
IGW-74-01	04/30/1998	Groundwater	CPT	25 ft	2
IGW-74-01A	04/30/1998	Duplicate	CPT	25 ft	2
IGW-76-01	04/29/1998	Groundwater	CPT	45 ft	1
IGW-77-01	04/24/1998	Groundwater	CPT	55 ft	1
IGW-78-01	05/06/1998	Groundwater	CPT	50 ft	1
IGW-89-01	04/30/1998	Groundwater	CPT	40 ft	1, 2
IGW-97	05/06/1998	Groundwater	CPT	40 ft	2
IGW-98-01	04/30/1998	Groundwater	CPT	50 ft	2
IGW-99	04/28/1998	Groundwater	CPT	45 ft	2
MW28-GW1	10/27/1998	Groundwater	Well	Background	1, 3
MW29-GW1	10/27/1998	Groundwater	Well	Background	1, 3
MW30-GW1	10/27/1998	Groundwater	Well	Background	1, 3
MW31-GW1	11/02/1998	Groundwater	Well		1, 3
MW32-DP	10/28/1998	Duplicate	Well		1, 2, 3
MW32-GW1	10/28/1998	Groundwater	Well		1, 2, 3
MW33-GW1	10/28/1998	Groundwater	Well		1, 3
MW34R-GW1	11/02/1998	Groundwater	Well		1, 3
MW35-GW1	11/02/1998	Groundwater	Well		1, 2, 3
MW-36-GW1	11/02/1998	Groundwater	Well		1
MW37-GW1	11/02/1998	Groundwater	Well		1
MW38-GW1	11/03/1998	Groundwater	Well		1, 3
MW38-GW1D	11/03/1998	Duplicate	Well		1, 3
MW39-GW1	11/09/1998	Groundwater	Well		1, 2, 3
MW40-GW1	11/09/1998	Groundwater	Well		1, 3
MW42-DP	11/03/1998	Duplicate	Well		1, 2, 3
MW42-GW1	11/03/1998	Groundwater	Well		1, 2, 3
MW42-SP	11/03/1998	Split	Well		1, 2, 3
MW43-GW1	11/03/1998	Groundwater	Well		1, 3
MW43-GW1L	11/03/1998	Groundwater	Well		1, 3
MW44-GW1	11/04/1998	Groundwater	Well		1, 3
MW45-GW1	11/09/1998	Groundwater	Well		1, 2
MW47-GW1	11/09/1998	Groundwater	Well		1, 2, 3
MW48-GW1	11/05/1998	Groundwater	Well		1, 2, 3
MW49-GW1	11/04/1998	Groundwater	Well		1, 2
MW51-GW1	11/03/1998	Groundwater	Well		1
MW55-GW1	11/11/1998	Groundwater	Well		1
MW56-GW1	11/09/1998	Groundwater	Well		1
MW57-GW1	11/04/1998	Groundwater	Well		1, 3

Table 2-3. Summary of 1998 Groundwater Sampling Allied Industrial Park Former Macon Naval Ordnance Plant (Continued)

Sample Number	Date Collected	Sample Type	Sample Technique	Comment	Analyte Suite
MW58-GW1	11/06/1998	Groundwater	Well		1, 2
MW60-GW1	11/04/1998	Groundwater	Well		1, 3
MW61-GW1	11/05/1998	Groundwater	Well		1
MW62-GW1	11/04/1998	Groundwater	Well		1, 2
MW63-GW1	11/12/1998	Groundwater	Well		1
MW-64-GW1	11/12/1998	Groundwater	Well		1, 3
MW-65-GW1	11/12/1998	Groundwater	Well		1
MW-66-GW1	11/12/1998	Groundwater	Well		1, 2, 3
MW67-GW1	11/06/1998	Groundwater	Well		1, 3
MW67-GW1L	11/06/1998	Groundwater	Well		1, 3
MW68-GW1	11/06/1998	Groundwater	Well		1, 3
MW69-GW1	11/11/1998	Groundwater	Well		1
MW70-GW1	11/11/1998	Groundwater	Well		1
MW71-GW1	11/06/1998	Groundwater	Well		1, 2
MW72-GW1	11/03/1998	Groundwater	Well		1
MW73-GW1	11/04/1998	Groundwater	Well		1, 2, 3
MW73-SP	11/04/1998	Split	Well		1, 2, 3
PZ-1	11/02/1998	Groundwater	Well	Background	1
PZ-2	10/27/1998	Groundwater	Well	Background	1
PZ-3	11/05/1998	Groundwater	Well		1, 3
PZ-4	11/05/1998	Groundwater	Well		1
PZ-5	11/12/1998	Groundwater	Well		1, 3
PZ-6	11/11/1998	Groundwater	Well		1, 2
TRIP BLANK	04/16/1998	Groundwater			1

Analytical Suite
1 = VOCs (EPA 8260)
2 = SVOCs (EPA 8270)
3 = PP Metals (EPA 6010)

Table 2-4. Summary of 2000 Groundwater Sampling
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sampling Location Identifier	Date Collected	Sample Type	Sample Technique	Sample Location/Comment	Analyte Suite
MW-62A-01	06/12/00	Groundwater	Well		1
MW-62A-01A	06/12/00	Duplicate	Well		1
MW-70A-01	06/12/00	Groundwater	Well		1
MW-72-01	06/12/00	Groundwater	Well		1
MW-70A-01B	06/12/00	Split	Well		1
TB-005	06/12/00	Trip Blank			1
TB-005A	06/12/00	Trip Blank			1
IGW-201-01	06/01/00	Groundwater	CPT	Along western boundary of the Armstrong property	1
IGW-201-02	06/01/00	Groundwater	CPT	Along western boundary of the Armstrong property	1
IGW-202-01	06/01/00	Groundwater	CPT	Along western boundary of the Armstrong property	1
IGW-202-01B	06/01/00	Split	CPT	Along western boundary of the Armstrong property	1
IGW-203-01	06/01/00	Groundwater	CPT	Along western boundary of the Armstrong property	1
IGW-204-01C	06/01/00	Rinsate	CPT	Along western boundary of the Armstrong property	1
IGW-205-01	03/23/00	Groundwater	CPT	On Johns Mansville Property	1
IGW-206-01	03/23/00	Groundwater	CPT	On Johns Mansville Property	1
IGW-207-01	03/22/00	Groundwater	CPT	Southern Plume Area	1
IGW-207-01A	03/22/00	Duplicate	CPT	Southern Plume Area	1
IGW-208-01	03/22/00	Groundwater	CPT	Southern Plume Area	1
IGW-209-01	03/22/00	Groundwater	CPT	Southern Plume Area	1
TB-001	03/22/00	Trip Blank			1
TB-002	03/23/00	Trip Blank			1
TB-005	06/01/00	Trip Blank			1
TBA-005	06/01/00	Trip Blank			1

Analyte Suite
1 = VOCs (EPA 8260)

2.4.2.1 Background Groundwater

Based upon the review of the sample locations and available data, background groundwater was taken as sample locations PZ-1, PZ-2, MW-28, MW-29, MW-30, as well as (Rust) DPT samples IGW-61, IGW-62, IGW-18 and IGW-19. These locations are upgradient of the existing plume and industrial concerns of the AIP (see Figures 2-4 and 2-5).

2.4.3 1998 and 2000 Well Installations

Thirty-nine monitoring wells were installed between July 20, 1998 and August 14, 1998 at the AIP. Additionally, two monitoring wells were installed as part of the 2000 field activities. The 1998 wells were installed in the upper portions of the Water Table Aquifer, with the upper one to three feet of the screen in the vadose zone to allow for seasonal fluctuations. The 2000 wells (wells 62A and 70A) were installed in the bottom portions of the Water Table Aquifer. Well locations are depicted on Figure 2-5. Appendix D contains monitoring well boring logs and Appendix E contains well construction diagrams for all of the AIP wells. Well construction details are provided in Table 2-5.

The wells were installed to define the exiting VOC plume at the site as well as investigate potential sources across the AIP.

2.4.3.1 Drilling Methods

Monitoring wells were drilled using a Mobile B-61 or B-59 truck-mounted drill rig with 7-inch outside diameter hollow-stem augers, which created an eight-inch diameter borehole. Each borehole was advanced to approximately ten feet below the water table. After reaching the final depth, the well was placed in the bottom of the borehole. All wells were installed according to specifications in the Hazardous, Toxic, and Radioactive Waste (HTRW) manual (EM 1110-1-4000).

Well screens and well casings were supplied and delivered to the site by the subcontracted drilling company. Casing and screen sections were composed of new two-inch diameter flush-threaded Schedule 40 polyvinyl chloride (PVC). The materials were cleaned on site using a hot water pressure washer prior to installation. Screen sections were commercially fabricated and slotted. A threaded PVC end cap or plug was placed onto the bottom of each screen. All screens were manufactured by Johnson Wheelabrator.

Table 2-5. Well Construction Details and Water Table Levels
AIP Monitoring Wells
Former Macon Naval Ordnance Plant

Well No.	Date Installed	Total Boring Depth	Total Well Depth	Stickup	Total Depth Below TOC	Top of Screen	Bottom of Screen	Screen Slot Size	Top of Filter Sand	Quantity of Sand (bags)	Top of Bentonite	Date Developed
MW-28	07/27/1998	20.00	18.85	2.15	21.00	8.52	18.52	0.02	6.50	5.25	4.48	09/10/1998
MW-29	07/28/1998	67.00	65.81	2.19	68.00	55.50	65.51	0.02	52.48	6.75	49.20	09/10/1998
MW-30	07/30/1998	44.00	43.33	2.18	45.51	33.00	43.03	0.03	29.90	7.00	26.60	08/17/1998
MW-31	07/28/1998	36.00	35.30	2.13	37.43	25.00	35.00	0.02	21.90	6.00	19.00	08/13/1998
MW-32	07/29/1998	55.00	54.30	2.20	56.50	44.00	54.00	0.02	40.85	5.00	37.75	09/11/1998
MW-33	08/25/1998	52.00	51.30	-0.15	51.15	41.00	51.00	0.03	37.80	6.50	35.30	09/09/1998
MW-34	07/30/1998	41.00	40.30	2.50	42.80	30.00	40.00	0.02	27.30	7.00	24.30	--
MW-34R	08/28/1998	60.00	58.30	2.13	60.43	48.00	58.00	0.03	45.00	6.50	41.70	09/09/1998
MW-35	07/31/1998	54.00	53.30	2.20	55.50	43.00	53.00	0.03	39.80	6.00	36.40	09/10/1998
MW-36	07/31/1998	19.00	17.80	2.19	19.99	7.50	17.50	0.02	5.00	5.00	3.00	08/18/1998
MW-37	07/28/1998	39.00	38.30	2.23	40.53	28.00	38.00	0.02	25.00	6.00	21.60	08/12/1998
MW-38	07/23/1998	64.00	62.83	2.41	65.24	52.50	62.53	0.02	49.50	7.50	46.70	08/17/1998
MW-39	08/05/1998	23.00	22.40	1.77	24.17	12.10	22.10	0.02	9.40	7.00	6.30	08/17/1998
MW-40	08/03/1998	40.00	39.30	2.14	41.44	29.00	39.00	0.03	26.20	5.50	23.10	09/11/1998
MW-42	07/21/1998	55.00	54.30	2.22	56.52	44.00	54.00	0.02	41.00	5.50	38.70	08/13/1998
MW-43	08/05/1998	57.00	56.30	2.49	58.79	46.00	56.00	0.02	42.80	6.00	39.90	09/14/1998
MW-44	08/13/1998	59.00	58.10	2.12	60.22	47.80	57.80	0.03	41.45	6.25	41.45	09/14/1998
MW-45	08/04/1998	30.00	28.41	2.12	30.53	18.10	28.10	0.01	15.00	6.75	4.10	08/17/1998
MW-47	07/24/1998	50.00	49.30	2.23	51.53	39.00	49.00	0.02	36.00	5.00	33.00	08/13/1998
MW-48	07/23/1998	47.00	46.33	2.38	48.71	36.10	46.15	0.02	33.10	5.50	29.80	09/10/1998
MW-49	07/22/1998	47.00	46.30	2.07	48.37	36.00	46.00	0.02	33.00	5.00	30.20	08/11/1998
MW-51	08/06/1998	57.00	56.40	2.11	58.51	46.10	56.10	0.03	42.90	5.75	40.00	08/18/1998
MW-55	08/04/1998	33.00	32.80	2.42	35.22	22.50	32.50	0.02	19.00	6.00	15.90	08/13/1998
MW-56	07/24/1998	42.00	38.80	2.30	41.10	28.50	38.50	0.02	25.45	7.00	22.40	08/06/1998
MW-57	07/22/1998	45.00	42.35	2.29	44.64	32.00	42.05	0.02	28.85	7.00	26.30	09/10/1998
MW-58	08/11/1998	43.00	42.30	2.46	44.76	32.00	42.00	0.03	29.20	5.50	26.70	09/10/1998
MW-60	08/17/1998	55.00	54.30	2.17	56.47	44.00	54.00	0.03	40.90	6.00	37.50	09/14/1998
MW-61	08/18/1998	49.00	48.30	2.55	50.85	38.00	48.00	0.03	34.30	6.00	31.90	09/14/1998
MW-62	08/07/1998	44.00	43.30	2.35	45.65	33.00	43.00	0.03	26.40	7.25	22.60	09/14/1998
MW-63	08/12/1998	14.00	13.30	2.28	15.58	3.00	13.00	0.02	2.00	5.50	0.00	09/11/1998
MW-64	08/20/1998	38.00	37.30	2.28	39.58	27.00	37.00	0.03	24.00	5.50	20.70	08/25/1998
MW-65	08/20/1998	36.00	35.30	2.26	37.56	25.00	35.00	0.03	22.00	5.50	19.30	09/15/1998
MW-66	08/12/1998	38.00	37.30	2.63	39.93	27.00	37.00	0.03	24.10	6.00	20.50	08/20/1998
MW-67	08/12/1998	29.00	28.30	1.91	30.21	18.00	28.00	0.03	15.00	6.00	12.30	09/14/1998
MW-68	08/19/1998	60.00	59.30	2.13	61.43	49.00	59.00	0.03	45.90	6.00	42.60	09/15/1998
MW-69	08/13/1998	50.00	49.30	2.11	51.41	39.00	49.00	0.03	35.80	6.00	33.30	08/19/1998
MW-70	08/12/1998	40.00	38.42	1.94	40.36	28.60	38.60	0.03	20.60	9.75	17.00	08/19/1998
MW-71	08/10/1998	24.00	23.30	2.49	25.79	13.00	23.00	0.03	10.00	6.50	6.40	09/09/1998
MW-72	08/11/1998	28.00	26.57	1.90	28.47	16.25	26.27	0.03	13.22	6.50	10.00	09/11/1998
MW-73	08/10/1998	40.00	38.70	1.95	40.65	28.40	38.40	0.03	25.20	6.50	22.20	09/09/1998
PZ-1	10/11/1994	32.00	31.50	2.57	34.07	NA	NA	NA	NA	NA	NA	NA
PZ-2	10/06/1994	50.00	50.00	-0.30	49.70	NA	NA	NA	NA	NA	NA	NA
PZ-3	10/13/1994	57.00	55.00	2.32	57.32	NA	NA	NA	NA	NA	NA	NA
PZ-4	10/05/1994	50.00	50.00	2.11	52.11	NA	NA	NA	NA	NA	NA	NA
PZ-5	10/06/1994	25.00	25.00	2.28	27.28	NA	NA	NA	NA	NA	NA	NA
PZ-6	10/07/1994	30.00	30.00	2.31	32.31	NA	NA	NA	NA	NA	NA	NA
MW-62A	06/06/2000	56.00	55.60	2.60	58.20	45.40	55.40	0.02	42.80	3.50	38.10	06/08/2000
MW-70A	06/06/2000	59.00	58.80	2.45	61.25	48.60	58.60	0.02	45.00	4.50	40.60	06/08/2000

Table 2-5. Well Construction Details and Water Table Levels
AIP Monitoring Wells
Former Macon Naval Ordnance Plant (Continued)

Well No.	Date Grouting Complete	Total Grout Quantity	Ground Elevation	Well (TOC) Elevation	Water Depth below TOC	Feet of Head	Groundwater Elevation	Comments
MW-28	07/27/1998	1 sack	330.30	332.45	12.95	8.05	319.50	Background
MW-29	08/03/1998	13 sacks	369.57	371.76	60.05	7.95	311.71	Background
MW-30	07/31/1998	5 sacks	337.65	339.83	37.44	8.07	302.39	Background
MW-31	08/03/1998	5 sacks	336.89	339.02	28.21	9.22	310.81	
MW-32	08/03/1998	9 sacks	353.84	356.04	48.55	7.95	307.49	
MW-33	08/31/1998	9 sacks	347.28	347.13	43.27	7.88	303.86	Flush-mount
MW-34	--	--	--	--	--	--	--	Abandoned
MW-34R	08/28/1998	10 sacks	353.27	355.4	53.12	7.31	302.28	
MW-35	08/03/1998	8 sacks	346.76	348.96	46.98	8.52	301.98	
MW-36	07/31/1998		318.90	321.09	9.70	10.29	311.39	bentontite/fill to 3.5' bgs
MW-37	07/31/1998	4 sacks	337.48	339.71	32.78	7.75	306.93	
MW-38	08/03/1998	9.5 sacks	353.34	355.75	57.60	7.64	298.15	
MW-39	08/10/1998		315.82	317.59	8.33	15.84	309.26	bentontite/fill to 3.5' bgs
MW-40	08/03/1998	4 sacks	327.64	329.78	30.74	10.70	299.04	
MW-42	07/23/1998	7 sacks	345.06	347.28	48.79	7.73	298.49	
MW-43	08/14/1998	8 sacks	345.79	348.28	51.36	7.43	296.92	
MW-44	08/21/1998	8 sacks	347.00	349.12	52.46	7.76	296.66	
MW-45	08/10/1998	2 sacks	318.09	320.21	18.66	11.87	301.55	
MW-47	08/03/1998	7.5 sacks	338.24	340.47	44.38	7.15	296.09	
MW-48	07/24/1998	5 sacks	333.51	335.89	40.74	7.97	295.15	
MW-49	07/23/1998	6 sacks	334.92	336.99	38.07	10.30	298.92	
MW-51	08/10/1998	8 sacks	343.67	345.78	50.58	7.93	295.20	
MW-55	08/10/1998	3 sacks	321.71	324.13	27.66	7.56	296.47	
MW-56	08/03/1998	5 sacks	327.30	329.6	33.75	7.35	295.85	
MW-57	07/23/1998	5 sacks	330.03	332.32	37.37	7.27	294.95	
MW-58	08/11/1998	5 sacks	328.80	331.26	38.06	6.70	293.20	
MW-60	08/21/1998	7.5 sacks	342.55	344.72	48.65	7.82	296.07	
MW-61	08/21/1998	8 sacks	334.19	336.74	42.57	8.28	294.17	
MW-62	08/21/1998	6 sacks	327.84	330.19	37.46	8.19	292.73	
MW-63	08/12/1998		296.47	298.75	7.35	8.23	291.40	bentonite grout
MW-64	08/21/1998	3.5 sacks	321.82	324.1	32.12	7.46	291.98	
MW-65	08/21/1998	4 sacks	313.29	315.55	25.29	12.27	290.26	
MW-66	08/14/1998	4.5 sacks	319.92	322.55	32.20	7.73	290.35	
MW-67	08/14/1998	2.5 sacks	311.26	313.17	22.42	7.79	290.75	
MW-68	08/21/1998	10 sacks	341.62	343.75	51.69	9.74	292.06	
MW-69	08/14/1998	5 sacks	332.90	335.01	45.64	5.77	289.37	
MW-70	08/14/1998	2 sacks	318.36	320.3	31.31	9.05	288.99	
MW-71	08/11/1998	0.5 sacks	306.31	308.8	18.08	7.71	290.72	
MW-72	08/11/1998	2 sacks	308.88	310.78	20.61	7.86	290.17	
MW-73	08/21/1998	6 sacks	321.65	323.6	30.72	9.93	292.88	
PZ-1	NA	NA	322.60	325.17	9.66	24.41	315.51	Background
PZ-2	NA	NA	351.00	350.70	42.72	6.98	307.98	Background
PZ-3	NA	NA	343.80	346.12	49.86	7.46	296.26	
PZ-4	NA	NA	333.00	335.11	41.91	10.20	293.20	
PZ-5	NA	NA	308.20	310.48	16.76	10.52	293.72	
PZ-6	NA	NA	304.90	307.21	18.30	14.01	288.91	
MW-62A	06/06/2000	3 sacks	328.10	330.77	40.41	17.79	290.36	
MW-70A	06/06/2000	4 sacks	318.20	320.77	33.86	27.39	286.91	

Granular filter pack materials were supplied and delivered to the job site in the manufacturer's bags by the subcontracted drilling company. Filter pack material consisted of inert subrounded quartz sand. The site geologist visually inspected the filter pack materials prior to use. The filter pack extended from the bottom of the borehole to a minimum of two feet above the well screen. The final depth to the top of the filter pack was measured with a weighted tape.

An annular seal composed of 3/8-inch diameter bentonite pellets was added above the filter pack. Frequent measurement of the accumulation of bentonite was conducted to ensure bridging did not occur and to ensure that the seal was of optimal thickness (two to four feet). After placement of the bentonite pellets a small volume of approved water was added to hydrate the pellets. The pellets were allowed to hydrate for at least one hour prior to adding grout.

Grout used for monitoring well installation was composed of Type I Portland cement, three pounds of dry powdered bentonite per 94-pound bag of dry cement, and a maximum of seven gallons of water. The grout was mechanically or hand mixed above ground in a tub to produce a thick lump-free mixture. The grout was placed in the annulus with a side discharge tremie pipe of rigid construction. Grouting continued until the grout remained near the required depth for surface completion.

2.4.3.2 Field Sieve Analysis

Screen slot sizes and filter pack materials were selected to match the grain size of the hydrologic unit being filtered. A field sieve analysis was performed on material from each proposed screen interval to determine the appropriate filter pack/slot size combination. Field sieve analyses were conducted and filter pack/slot size determined using American Society for Testing and Materials (ASTM) Method D5092. Field sieve data sheets are provided as Appendix F. Selected slot size and other well construction details are provided in Table 2-5.

2.4.3.3 Geotechnical Sampling

During drilling for well installations at the AIP, soil samples were collected continuously over two-foot intervals from the ground surface to the water table at each monitoring well location using split-spoon samplers. A qualified geologist visually classified each two-foot interval according to the Unified Soil Classification System. Soil grab samples for geotechnical analysis were collected from 22 monitoring well borings between March 28, 1998 and October 12, 1998 to verify the visual classification. At least one sample was collected from each boring for grain-size distribution and moisture content analysis. Additional samples were collected at twelve locations for Atterberg limits analysis. Atterberg limits analyses were performed only when a layer of fine-grained material greater than six inches thick was encountered. The samples were placed into zip-lock bags and sealed to preserve moisture content. All of the samples were analyzed at S&ME, Inc. in Knoxville, TN. The analyses were performed in accordance with ASTM Methods D2216 (moisture content), C136 and C117 (grain-size distribution), and D4318 (Atterberg limits). Appendix G provides summary tables of the geotechnical test results.

At corehole CH-6 (AIP) and coreholes CH-10 and MW-4B (landfill), relatively undisturbed sections of continuous core were packaged in plastic sleeves and shipped to the certified laboratory for dry density, moisture content, and vertical permeability analysis. Appendix G contains the summary tables from the geotechnical laboratory with all sieve, permeability, and Atterburg limits data.

2.4.4 Well Development

Following well installation, each monitoring well was developed for sampling. Well development was not initiated sooner than 48 hours after internal mortar collar placement or the final grouting of the well. Wells were developed using a Teflon™ bailer in combination with a submersible pump. The pump was alternately stopped and started to produce a surging action. Water removed during development was captured in a 5-gallon bucket. The rate of filling the bucket was monitored to estimate the effective yield of the well. Each time the bucket was filled, it was emptied into a closed-top 55-gallon drum. This drum was labeled as Investigation-derived Waste (IDW) and staged with development water from other wells at the IDW staging area.

Development of each well proceeded until the following criteria were met:

- the water was clear to the unaided eye
- the sediment thickness within the well was less than 0.1 foot
- a minimum of five times the standing water volume in the well (to include the well screen and casing plus saturated annulus, assuming 30 percent annular porosity) was removed

During water removal, water quality parameters were measured on a frequent basis to determine when representative formation water was being drawn into the well, evidenced by the stabilization of the parameters. Measured parameters included pH, conductivity, temperature, dissolved oxygen, and turbidity. A Horiba U-10 water quality instrument was used to measure the water quality parameters. The instrument was calibrated each day of use in accordance with the approved Work Plan (SAIC 2000). Well development data collected in the field including water quality parameters, gallons purged, and dates/times, are contained in Table 2-6.

For each monitoring well, a one-liter sample of the last water removed during development was placed into a clear glass jar and labeled with the well number and date. Each sample was individually agitated and immediately photographed close up with a 35-millimeter camera loaded with color print film.

2.4.5 Groundwater Sampling

All 39 new monitoring wells, plus the existing piezometers were sampled during the period from October 27 through November 18, 1998. In addition, two production wells on the AIP (AWL-6 and GHW-1) were also sampled. The two new wells (MW-62A and MW-70A) installed in 2000 were sampled on June 12, 2000. Prior to sampling, well purging was conducted to ensure that groundwater samples were representative of the formation being monitored. This was accomplished by monitoring water quality parameters while pumping with a low-flow peristaltic pump. For approximately every gallon purged, readings were taken using a Horiba™ U-10 water quality instrument. When stabilization was reached, a sample for metals analysis was taken directly from the tygon tubing used for sampling discharge. Following retrieval of the metals sample, the pump tubing was removed from the well and a teflon bailer was used to retrieve a sample for VOC analysis. A summary of the wells sampled and analyses performed is provided in Tables 2-3 and 2-4. The existing piezometers (PZ-1 through PZ-6) were also sampled using the above techniques. The water quality parameters measured at the time of sample collection are summarized on Table 2-7.

CPT groundwater samples were collected from various locations (Figure 2-5) during 1998 and 2000. A summary of samples collected during 2000 is provided in Table 2-3 and Table 2-4.

2.4.6 Slug Testing

Field permeability (slug) tests were conducted on 20 of the 39 AIP monitoring wells on October 5 and 6, 1998. The tests were conducted using an electronic data logger, pressure transducer, and a solid cylinder (slug) measuring 5 ft long by 1 in. in diameter. The tests were performed by immersing the cylinder in each well, causing an instantaneous rise in head within the well casing or screen. The water level was allowed to naturally equilibrate, and the rate of equilibration (falling head) was recorded. The cylinder was then suddenly removed to create an instantaneous drop in head. As the

Table 2-6. AIP Field Water Quality Measurements - Monitoring Wells
Well Development Data

Well No.	Development		Total Gals. Purged	Temperature	Specific Conductivity		pH		Turbidity		Final Water Level (TOC)	Comments
	Start	Finish			Start	Finish	Start	Finish	Start	Finish		
MW-28	08/13/1998	09/10/1998	88.00	23.0	91	120	5.17	5.04	999	13	12.95	1.00
MW-29	08/13/1998	09/10/1998	77.00	21.2	102	63	5.33	5.24	846	61	60.05	1.00
MW-30	08/17/1998	08/17/1998	34.50	19.2	174	79	5.45	5.12	999	23	37.44	
MW-31	08/13/1998	08/13/1998	45.00	19.7	95	72	4.63	4.68	999	14	28.21	
MW-32	08/12/1998	09/11/1998	92.00	22.3	83	75	4.87	4.61	999	43	48.55	1.00
MW-33	09/02/1998	09/09/1998	82.00	21.6	92	62	4.91	5.09	323	127	43.27	1.00
MW-34R	08/31/1998	09/09/1998	73.50	21.2	115	70	5.03	4.97	999	81	53.12	1.00
MW-35	08/11/1998	09/10/1998	84.00	22.8	121	103	5.14	4.72	999	26	46.98	1.00
MW-36	08/18/1998	08/18/1998	16.50	21.9	152	109	5.61	5.60	999	733	9.70	
MW-37	08/12/1998	08/12/1998	37.00	19.6	76	47	5.36	5.42	999	16	32.78	
MW-38	08/17/1998	08/17/1998	33.70	20.6	80	60	5.53	4.96	856	8	57.60	
MW-39	08/17/1998	08/17/1998	48.00	21.8	157	228	5.93	5.63	999	26	8.33	
MW-40	08/12/1998	09/11/1998	101.00	19.1	239	177	6.48	6.19	999	8	30.74	1.00
MW-42	08/13/1998	08/13/1998	37.50	21.4	80	73	4.66	4.47	660	4	48.79	
MW-43	08/17/1998	09/14/1998	83.00	21.1	52	51	4.79	4.76	999	21	51.36	1.00
MW-44	08/18/1998	09/14/1998	84.00	21.3	124	57	6.09	5.11	999	36	52.46	1.00
MW-45	08/17/1998	08/17/1998	38.70	20.1	316	318	4.82	4.61	999	11	18.66	
MW-47	08/13/1998	08/13/1998	35.50	21.3	206	159	6.27	5.88	999	24	44.38	
MW-48	08/11/1998	08/11/1998	50.00	21.7	50	46	5.56	5.44	999	8	40.74	
MW-49	08/11/1998	08/11/1998	50.00	21.9	65	65	4.94	4.68	999	11	38.07	
MW-51	08/18/1998	08/18/1998	37.00	21.5	85	58	5.61	5.04	999	63	50.58	
MW-55	08/13/1998	08/13/1998	36.00	19.2	124	198	5.99	6.25	999	71	27.66	
MW-56	08/06/1998	08/06/1998	85.00	22.2	503	185	6.12	6.24	603	9	33.75	
MW-57	08/11/1998	09/10/1998	87.00	21.2	152	58	5.07	4.75	999	4	37.37	1.00
MW-58	08/19/1998	09/10/1998	92.00	21.8	31	40	5.36	5.18	999	36	38.06	1.00
MW-60	08/25/1998	09/14/1998	86.00	21.7	74	66	5.14	4.82	444	43	48.65	1.00
MW-61	08/24/1998	09/14/1998	86.00	21.1	49	46	5.17	4.81	999	4	42.57	1.00
MW-62	08/19/1998	09/14/1998	91.00	22.4	61	67	5.18	4.95	999	87	37.46	1.00
MW-63	08/20/1998	09/11/1998	91.00	21.2	142	115	5.65	5.42	999	64	7.35	1.00
MW-64	08/25/1998	08/25/1998	31.00	19.4	108	101	5.84	5.72	999	73	32.12	
MW-65	08/25/1998	09/15/1998	115.00	18.4	104	84	5.36	5.08	999	5	25.29	1.00
MW-66	08/20/1998	08/20/1998	32.50	19.3	76	61	5.14	5.06	999	33	32.20	
MW-67	08/24/1998	09/14/1998	96.00	19.5	102	46	4.74	4.74	691	23	22.42	1.00
MW-68	08/24/1998	09/15/1998	142.00	21.1	45	37	5.25	4.84	999	9	51.69	1.00
MW-69	08/19/1998	08/19/1998	27.50	21.6	133	78	5.76	4.97	999	216	45.64	
MW-70	08/19/1998	08/19/1998	40.00	20.6	109	61	5.67	5.59	554	238	31.31	
MW-71	08/24/1998	09/09/1998	80.00	20.3	81	49	5.69	5.30	999	88	18.08	1.00
MW-72	08/18/1998	09/11/1998	103.00	20.9	221	69	8.88	5.30	999	41	20.61	1.00
MW-73	08/20/1998	09/09/1998	137.00	20.6	218	56	6.50	5.21	999	78	30.72	1.00
MW-62A	06/07/2000	06/08/2000	165.00	22.0	71	59	NA	NA	100	4	40.38	
MW-70A	06/07/2000	06/08/2000	165.00	21.8	55	55	NA	NA	28	22	33.85	

(1.00) in comment block means extra development required for sand removal

Table 2-7. AIP Field Water Quality Measurements - Monitorings Wells
Well Sampling Data

Well No.	Sampling Date	Static Level	Total Gals. Purged	pH		Specific Conductivity		Turbidity		Dissolved Oxygen		Temperature		Comments
				Start	Finish	Start	Finish	Start	Finish	Start	Finish	Start	Finish	
MW-28	10/27/1998	12.14	5.50	5.00	4.90	79	77	117	0	8.27	7.99	23.4	23.0	
MW-29	10/27/1998	59.68	8.50	6.21	5.39	89	55	891	0	10.53	8.02	23.8	24.3	
MW-30	10/27/1998	37.17	15.00	5.01	5.09	132	66	664	4	8.13	7.63	17.9	21.1	
MW-31	11/02/1998	27.61	7.50	5.46	4.75	35	69	479	0	7.68	9.35	25.7	22.6	
MW-32	10/28/1998	48.20	8.00	4.69	4.61	65	65	72	0	9.08	8.42	21.0	23.4	
MW-33	10/28/1998	43.01	7.00	5.25	4.87	43	52	210	0	7.99	7.44	17.9	23.4	
MW-34R	11/02/1998	52.90	4.50	4.79	4.84	64	55	599	0	8.92	7.9	19.4	22.2	
MW-35	11/02/1998	46.73	9.00	4.59	4.49	101	71	28	0	8	8.66	22.0	21.1	
MW-36	11/02/1998	9.50	5.00	5.86	5.99	183	212	310	0	9.89	9.55	22.8	22.2	
MW-37	11/02/1998	32.19	7.00	5.69	5.32	44	38	78	0	8.45	9.7	27.2	23.0	
MW-38	11/03/1998	57.28	7.00	5.07	4.71	49	53	999	0	8.9	8.99	22.5	23.1	
MW-39	11/09/1998	7.87	13.00	5.70	5.92	175	169	958	20	8.72	9.05	21.4	21.2	
MW-40	11/09/1998	30.52	7.00	6.65	6.36	242	189	207	0	9.06	8.86	18.2	18.7	
MW-42	11/03/1998	48.50	14.00	5.10	4.54	80	60	108	0	8.69	8.78	21.2	21.4	
MW-43	11/03/1998	51.04	6.00	5.26	4.72	47	46	999	0	9.22	8.82	21.5	22.8	
MW-44	11/04/1998	52.21	5.00	5.50	4.76	56	43	366	0	8.44	7.77	18.7	20.1	
MW-45	11/09/1998	18.47	9.00	4.71	4.57	298	264	21	0	10.69	8.36	19.7	20.0	
MW-47	11/09/1998	44.18	12.00	6.09	5.90	89	119	999	130	9.12	8.76	18.4	21.1	
MW-48	11/05/1998	40.41	5.00	5.36	5.38	53	41	850	0	8.31	7.9	19.4	20.7	
MW-49	11/04/1998	37.78	7.00	4.99	4.90	58	56	999	0	8.56	8.72	21.7	23.0	
MW-51	11/03/1998	50.21	5.00	5.45	4.80	51	47	999	0	9.25	8.86	23.6	23.9	
MW-55	11/11/1998	27.50	14.00	5.44	6.00	125	184	999	14	8.91	8.26	19.5	19.8	
MW-56	11/09/1998	33.50	11.00	6.21	6.21	191	194	999	40	9.88	8.77	23.0	22.8	
MW-57	11/04/1998	37.04	5.00	4.89	4.71	55	52	455	0	8.68	8.76	22.1	21.4	
MW-58	11/06/1998	37.88	6.00	5.15	4.61	38	47	999	0	9.11	7.18	14.6	18.9	
MW-60	11/04/1998	48.38	6.00	5.22	4.64	56	64	999	0	8.14	7.84	19.9	21.8	
MW-61	11/05/1998	42.21	6.00	4.81	4.71	40	44	999	0	8.25	7.85	20.1	20.7	
MW-62	11/04/1998	37.06	6.00	5.32	4.87	54	51	568	0	8.8	8.17	19.8	21.4	
MW-63	11/12/1998	7.30	6.00	6.43	5.92	397	170	22	1	9.31	8.61	20.6	20.0	
MW-64	11/12/1998	32.01	12.00	5.47	5.92	130	123	999	8	8.05	7.7	16.4	17.9	
MW-65	11/12/1998	25.20	5.00	6.16	5.72	155	104	999	7	8.01	7.93	16.9	17.8	
MW-66	11/12/1998	32.08	8.00	4.79	4.76	75	66	999	82	8.75	7.67	15.3	18.5	
MW-67	11/06/1998	22.22	7.00	4.73	4.62	48	47	0	0	8.43	7.86	17.8	17.8	
MW-68	11/06/1998	51.58	6.00	5.12	4.71	26	35	999	0	7.76	7.12	17.7	19.5	
MW-69	11/11/1998	45.48	5.00	5.06	4.73	37	40	367	50	8.3	7.32	19.1	21.3	
MW-70	11/11/1998	31.14	15.00	5.57	5.21	54	50	999	109	8.6	8.16	18.5	19.6	
MW-71	11/06/1998	18.76	4.00	4.83	4.81	42	41	46	0	7.6	7.6	18.4	18.2	
MW-72	11/03/1998	20.07	5.00	4.95	4.88	45	48	10	0	10.31	9.93	21.9	21.8	
MW-73	11/04/1998	30.36	5.00	4.79	4.72	55	44	9	0	8.53	8.13	19.6	20.5	
PZ-1	11/02/1998	8.83	7.00	4.91	4.58	68	97	166	0	10.84	10.81	22.4	20.7	
PZ-2	10/27/1998	42.43	3.00	4.75	4.79	77	72	999	999	8.16	9.17	25.5	26.5	Well pumps dry
PZ-3	11/05/1998	49.61	24.00	5.14	4.51	65	50	999	16	8.85	7.72	18.0	20.4	
PZ-4	11/05/1998	41.61	4.00	4.75	4.68	31	31	0	0	8.46	8.3	19.2	19.8	
PZ-5	11/12/1998	16.65	5.50	5.79	6.01	109	154	999	224	8.23	8.79	20.4	20.5	
PZ-6	11/11/1998	18.05	9.00	4.60	4.57	50	47	221	17	7.57	9.08	21.0	21.0	
MW-62A	06/12/2000	40.41	20	5.9	5.6	0.117	0.06	35	2	12.42	11.44	24.5	22.8	
MW-70A	06/12/2000	33.86	20	5.4	5.6	96	56	8	0	10.77	10.78	23.2	21.8	

head rose back to equilibrium (rising head) the rate of change was measured. These falling and rising head data were used to calculate the hydraulic conductivity of the portion of the aquifer surrounding each well screen.

Water level measurements were recorded using an In-Situ PXD-261 pressure transducer connected to a Hermit 3000 data logger. The data were downloaded following slug testing and analyzed using the AquiferTest computer program (Roehrich 1999). The solution method of Bouwer and Rice (1976), updated by Bouwer (1989) was used to determine the hydraulic conductivity for each of the wells. Appendix H contains the slug test plots for the 20 wells, rising and falling head. All of the tested wells are screened in the uppermost portion of the Water Table Aquifer. The specific wells tested and results are provided in Section 3.0.

2.4.7 Potentiometric Data

Following completion of well development, slug testing, and sampling, a round of synchronous (same day) water levels was recorded from all AIP and Landfill wells on December 3, 1998. Water depths below top of casing were measured using an electric tape in all new and existing wells. Depths were recorded in the field and later input to a spreadsheet, which converted, the depths below top of casing to elevations above mean sea level. The elevation data were then used to generate a map of the water table surface across the AIP and Landfill. Table 2-5 provides the water level elevations from December 3, 1998.

2.5 Sampling of Sediment and Surface Water

During 2000, surface water and sediment samples were collected from the middle AIP drainage feature exiting the AIP to the south, across the Landfill and into the adjacent bottomland swamp. The specific locations are provided on Figure 2-6.

2.5.1 Surface Water Sampling

Surface water samples were collected on March 9 and March 10, 2000. Two samples were collected from separate location in the drainage The specific samples and analyses performed are summarized on Table 2-8.

The water present in the drainage feature was very shallow, but was sufficient to allow sampling using a stainless steel bowl to collect the water. Surface water samples were analyzed for VOCs (EPA method 8260), pp metals (EPA method 6010/7471), and PCBs (EPA method 8081). Filtered

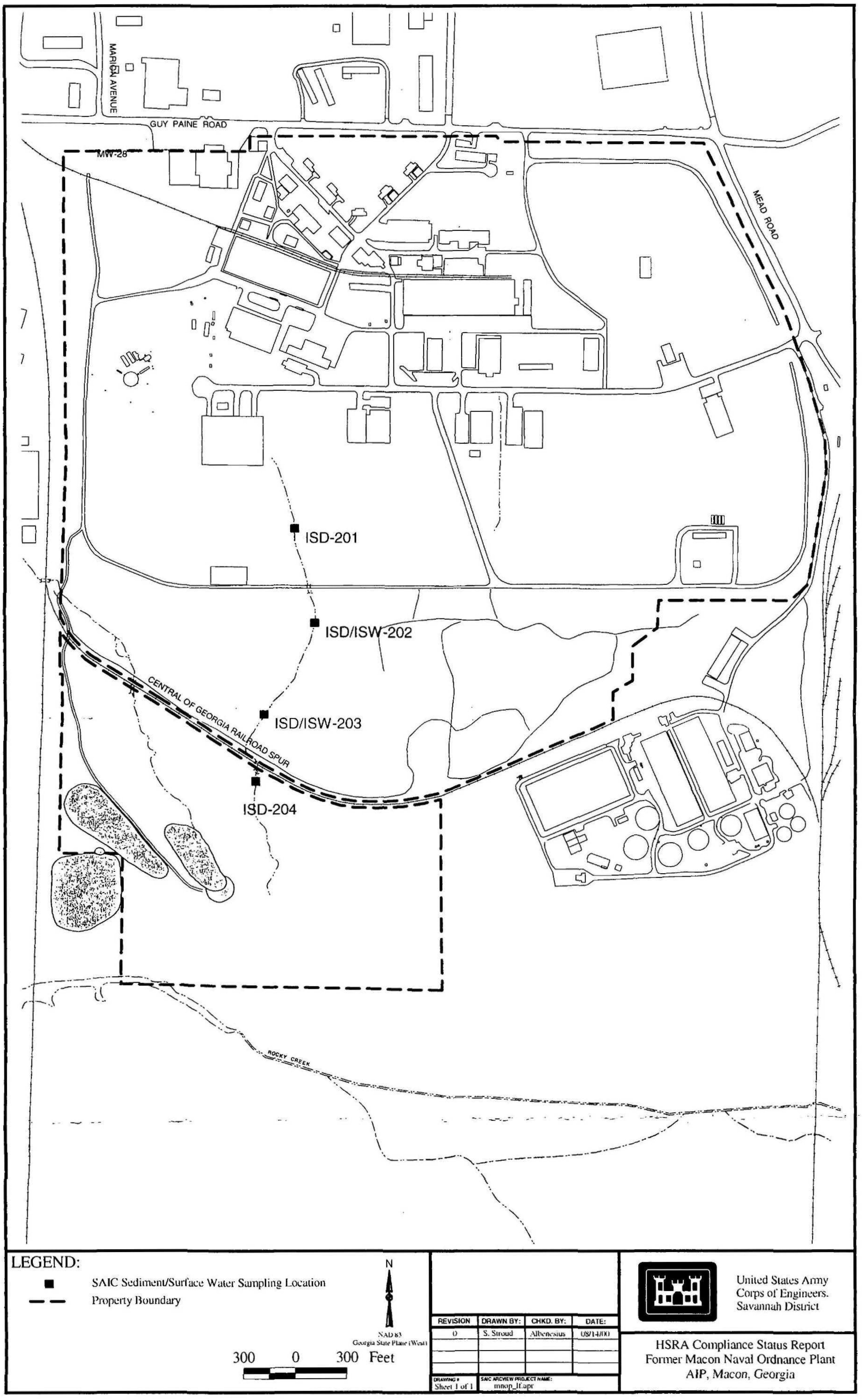

Figure 2-6. SAIC Surface Water and Sediment Sampling Locations

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Table 2-8. Summary of 2000 Sediment and Surface Water Sampling
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sampling Location Identifier	Date Collected	Sample Type	Sample Location/Comment	Analyte Suite
ISW-203-01	03/09/00	Surface Water	Politex property - Rocky Creek Drainage	2
ISW-203-01F	03/09/00	Surface Water - Filtered	Politex property - Rocky Creek Drainage	3
ISW-203-01B	03/09/00	Split	Politex property - Rocky Creek Drainage	2
ISW-203-01BF	03/09/00	Split - Filtered	Politex property - Rocky Creek Drainage	3
ISW-202-01A	03/10/00	Duplicate	Politex property - Rocky Creek Drainage	2
ISW-202-01AF	03/10/00	Duplicate - Filtered	Politex property - Rocky Creek Drainage	3
ISW-202-01	03/10/00	Surface Water	Politex property - Rocky Creek Drainage	2
ISW-202-01F	03/10/00	Surface Water - Filtered	Politex property - Rocky Creek Drainage	3
TB-002	03/09/00	Trip Blank		1
TB-003	03/09/00	Trip Blank		1
TB-004	03/10/00	Trip Blank		1
ISD-201-01	03/10/00	Sediment	Politex property - Rocky Creek Drainage	4
ISD-201-01C	03/10/00	Rinsate	Politex property - Rocky Creek Drainage	5
ISD-202-01	03/10/00	Sediment	Politex property - Rocky Creek Drainage	4
ISD-202-01A	03/10/00	Duplicate	Politex property - Rocky Creek Drainage	4
ISD-203-01	03/09/00	Sediment	Politex property - Rocky Creek Drainage	4
ISD-203-01B	03/09/00	Split	Politex property - Rocky Creek Drainage	4
ISD-204-01	03/10/00	Sediment	Politex property - Rocky Creek Drainage	4

Analyte Suite
1 = VOCs (EPA 8260)
2 = VOCs, PCBs (Unfiltered), PP Metals
3 = PCBs (Filtered)
4 = VOCs, PCBs, PAHs, PP Metals
5 = VOCs and PP Metals

and unfiltered samples were collected for PCB analysis. Duplicates and splits were also collected. Sample results for AIP surface water are summarized in Appendix O and raw validated data are provided in Appendix N.

2.5.2 Sediment Sampling

Sediment samples were collected on March 9 and March 10, 2000. Four samples were collected from separate locations in the drainage. The specific samples and analyses performed are provided in Table 2-8.

The sampling objectives were to assess if VOCs were expressing into the drainage feature from the local groundwater. Also, the PCBs were analyzed in order to ascertain potential contributions from the AIP. The samples were collected using a clean stainless steel spoon and transferred directly to the sample containers.

2.6 Civil Survey

Following completion of the 1998 soil sampling and monitoring well installations, a survey was performed to document the locations. The survey was performed under the supervision of a Georgia registered surveyor by the firm of Adams, Craft, Herz, and Walker. The survey was performed in two mobilizations, one from June 1 through June 7, 1998 to locate soil sampling sites and a second one from October 4 through October 8, 1998 to locate monitoring wells.

Fourteen new monuments were established across the AIP and Landfill areas. Horizontal and vertical control were established at the individual locations using Global Positioning System (GPS) tying to existing survey control points. Horizontal data are based on the North American Datum of 1983 (NAD 83) State Plane Coordinate System, Georgia West Zone. Vertical datum for the survey is relative to North American Vertical Datum 1988 (NAVD 88). The field location of data was obtained using a Topcon 303DPG total station.

Coordinates and elevations were established for each monitoring well and soil sampling location, including geologic coreholes. The coordinates are accurate to within 1.0 ft. A permanent survey mark was scribed on the top of each monitoring well casing. Ground elevations are accurate to the nearest 0.1 ft and top of casing elevations are accurate to within 0.01 ft. Elevations for monitoring wells were confirmed using a Topcon GTS3 automatic level.

Survey data for all of the AIP monitoring wells and soil sampling points are included in Table 2-9. Appendix K contains the surveyor's report. An additional civil survey was performed to document the locations of the 2000 soil and groundwater sampling stations. This report is also included in Appendix K and the 2000 survey data are included in Table 2-9. Surface water and sediment sampling locations were not surveyed, but were located using visual landmarks and field maps.

2.7 Investigation-Derived Waste Management

During AIP sampling and well installation activities, IDW was generated. Both solid (soil) and liquid (water) IDW were generated. Sources of soil IDW were coring, monitoring well installation, and soil sampling. Sources of liquid IDW were well development, well purging for sampling, and equipment decontamination.

During the investigation, soil IDW was placed in open top 55-gallon drums and liquid was placed in bung-type, closed-top drums. Drums were sealed and transported to a central staging area. The drums were labeled as IDW pending receipt of laboratory results. The drum staging area was roped off and labeled as an IDW staging area.

SAIC conducted an evaluation of IDW using corresponding data from each boring or well if available. Where these data were not available, data from the nearest available boring or well were used for comparison. Laboratory results were extrapolated using the 20 divisor rule for soils to reflect Toxicity Characteristic Leachate Procedure (TCLP) values and compared to 75 percent of the TCLP regulatory limit. Laboratory results were also compared to background and Georgia HSRA Type 1 and Type 3 Risk Reduction Standards for soil. Following the comparisons, AIP IDW was grouped into four categories:

- Potentially Hazardous: IDW in this category had one or more analytes with detected concentrations greater than the TCLP value (after dividing by 20). No soil IDW generated within the AIP was found to be potentially hazardous. Twelve drums of liquid IDW from various wells fell into this category.

- Contaminated Nonhazardous, Off-site Disposal: Eleven drums of soil and 42 drums of liquid IDW were identified in this category.

Table 2-9. Summary of Civil Survey for Sample Locations
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sample Number	Northing	Easting	Elevation (ft above msl)	Sample by
ISL-1	1010897.74	659436.27	330.3	rust
ISL-2	1010937.13	659751.54	347.1	rust
ISL-3	1010682.22	659646.48	344.2	rust
ISL-4	1010507.52	660078.18	345.1	rust
ISL-5	1010729.50	660319.88	346.8	rust
ISL-6	1010713.97	660483.72	347.2	rust
ISL-7	1010677.58	660595.87	346.7	rust
ISL-8	1010129.61	658796.30	312.9	rust
ISL-9	1010148.44	658961.33	315.9	rust
ISL-10	1010203.42	658985.44	316.5	rust
ISL-11	1010248.51	659006.05	317.9	rust
ISL-12	1009379.85	659974.43	328.2	rust
ISL-13	1009335.99	660646.29	330.2	rust
ISL-14	1009413.29	661237.29	334.3	rust
ISL-15	1009536.50	661799.34	320	rust
ISL-16	1009820.48	662069.09	326	rust
ISL-17	1008989.06	659160.91	315.5	rust
ISL-18	1011447.25	660533.99	376.2	rust
ISL-19	1011441.14	660803.89	378.3	rust
ISL-20	1010898.28	659942.47	350.4	rust
ISL-21	1010835.99	660053.08	350.1	rust
ISL-22	1010716.51	660755.41	352.9	rust
ISL-23	1010734.21	660812.68	352	rust
ISL-24	1009879.07	659134.53	331.4	rust
ISL-25	1010037.44	659223.83	330.5	rust
ISL-26	1009968.67	659399.01	335.1	rust
ISL-27	1009799.37	659406.12	332.1	rust
ISL-28	1009043.85	659528.90	332.9	rust
ISL-29	1009089.77	659653.88	332.6	rust
ISL-30	1009048.40	659767.03	333.7	rust
ISL-31	1008933.67	659675.83	331.5	rust
ISL-32	1009244.50	662382.75	316	rust
ISL-33	1009334.26	662535.09	316	rust
ISL-34	1009002.71	662462.23	309.3	rust
ISL-35	1009034.06	662293.31	307.4	rust
ISL-36	1010843.01	661952.87	349.4	rust
ISL-37	1010723.68	662003.58	348.8	rust
ISL-38	1010634.29	661984.79	348	rust
ISL-39	1010646.38	661907.71	350.2	rust
ISL-40	1010694.97	660858.07	348.4	rust
ISL-41	1010703.85	661088.31	349.2	rust
ISL-42	1010596.21	661370.13	367.6	rust
ISL-43	1010440.73	661097.48	348.9	rust
ISL-44	1010448.64	660725.20	349.2	rust
ISL-45	1010592.02	660603.30	348.8	rust
ISL-46	1010239.08	660715.53	345.9	rust
ISL-47	1010249.76	660883.23	346	rust
ISL-48	1010108.75	660793.62	345.8	rust
ISL-49	1010239.88	660999.63	346.5	rust
ISL-50	1010218.19	661182.96	346.9	rust
ISL-51	1010097.39	661149.10	346	rust
ISL-52	1010209.46	661299.73	346.3	rust
ISL-53	1010207.52	661388.53	346.6	rust
ISL-54	1010148.77	661404.86	346.7	rust
ISL-55	1010149.42	661300.99	346.8	rust
ISL-56	1010374.16	661636.04	353.3	rust

Table 2-9. Summary of Civil Survey for Sample Locations
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample Number	Northing	Easting	Elevation (ft above msl)	Sample by
ISL-57	1010254.75	661674.61	353.5	rust
ISL-58	1010140.17	661642.27	353.5	rust
ISL-59	1010249.96	661524.58	353.7	rust
ISL-60	1010835.96	659951.15	345.9	rust
ISL-61	1011064.23	659007.96	325.3	rust
ISL-62	1011396.26	661869.71	336.6	rust
ISL-63	1010488.35	660131.49	345.3	rust
ISL-64	1010915.02	658969.22	321.75	saic
ISL-65	1011066.65	659090.06	326	saic
ISL-66	1010971.30	659655.15	346.22	saic
ISL-67	1010994.54	659780.02	349.44	saic
ISL-68	1010918.62	659856.14	349.28	saic
ISL-69	1010884.70	659934.91	350.67	saic
ISL-70	1010798.36	660031.49	346.06	saic
ISL-71	1010959.14	659960.53	360.24	saic
ISL-72	1010769.52	661020.96	353.49	saic
ISL-73	1010677.53	661060.82	348.85	saic
ISL-74	1010681.87	661220.85	349.26	saic
ISL-75	1010692.95	661904.73	352.15	saic
ISL-76	1010629.09	661875.25	356.63	saic
ISL-77	1010654.21	661940.48	350.72	saic
ISL-78	1010907.90	659118.55	322.14	saic
ISL-79	1010750.93	659525.76	343.56	saic
ISL-80	1010670.85	659726.79	344.78	saic
ISL-81	1010512.33	659984.93	345.35	saic
ISL-82	1010455.32	660256.48	346.89	saic
ISL-83	1010395.75	661522.24	355.53	saic
ISL-84	1010621.27	659575.74	344	saic
ISL-85	1010413.00	660111.23	344.43	saic
ISL-86	1010323.37	661014.69	347.58	saic
ISL-87	1010347.28	661473.88	352.57	saic
ISL-88	1010332.89	661742.58	354.39	saic
ISL-89	1010266.28	660911.47	346.52	saic
ISL-90	1010222.91	661251.81	346.93	saic
ISL-91	1010211.34	661394.30	347.02	saic
ISL-92	1010073.60	658919.14	318.16	saic
ISL-93	1010100.85	659250.58	333.59	saic
ISL-94	1010092.29	659420.17	337.18	saic
ISL-95	1010139.34	661014.09	347.01	saic
ISL-96	1010131.44	661141.19	347.14	saic
ISL-97	1010115.01	661521.63	353.15	saic
ISL-98	1010159.76	661738.76	353.47	saic
ISL-099	1010063.66	661607.87	351.1	saic
ISL-100	1010044.04	659112.60	325.26	saic
ISL-101	1009907.87	659233.75	331.07	saic
ISL-102	1009892.92	659441.01	334.69	saic
ISL-103	1009905.11	659307.06	330.37	saic
ISL-104	1009209.80	659461.48	334.05	saic
ISL-105	1008945.62	659650.16	330.95	saic
ISL-106	1009151.33	662340.84	312.32	saic
ISL-107	1009301.06	662464.80	312.67	saic
ISL-108	1009164.68	662453.82	311.06	saic
ISL-109	1009135.83	659790.51	333.61	saic
ISL-110	1009148.33	659611.45	334.59	saic
ISL-111	1009231.00	659976.43	325.21	saic
ISL-112	1009284.49	660054.89	326.94	saic

Table 2-9. Summary of Civil Survey for Sample Locations
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample Number	Northing	Easting	Elevation (ft above msl)	Sample by
ISL-115	1010025.59	658856.02	320.68	saic
ISL-116	1009933.06	658850.58	323.2	saic
ISL-117	1010134.34	658799.20	313.69	saic
ISL-118	1009575.74	662135.42	316.94	saic
ISL-119	1009700.02	661998.03	323.23	saic
ISL-120	1010188.03	661461.98	350.13	saic
ISL-121	1010264.26	661505.05	354.01	saic
ISL-122	1010466.10	661981.08	348.09	saic
ISL-123	1010651.06	662100.42	345.97	saic
ISL-125	1010086.79	661460.82	348.23	saic
ISL-126	1010171.98	2458069.78	347.82	saic
ISL-127	1009142.92	660747.72	336.67	saic
ISL-128	1009449.86	661710.42	322.28	saic
IGW-1	1010897.74	659436.27	330.3	rust
IGW-2	1010937.13	659751.54	347.1	rust
IGW-3	1010682.22	659646.48	344.2	rust
IGW-5	1010729.50	660319.88	346.8	rust
IGW-6	1010713.97	660483.72	347.2	rust
IGW-7	1010677.58	660595.87	346.7	rust
IGW-8	1010129.61	658796.30	312.9	rust
IGW-9	1010148.44	658961.33	315.9	rust
IGW-10	1010203.42	658985.44	316.5	rust
IGW-11	1010248.51	659006.05	317.9	rust
IGW-12	1009379.85	659974.43	328.2	rust
IGW-13	1009335.99	660646.29	330.2	rust
IGW-14	1009413.29	661237.29	334.3	rust
IGW-15	1009536.50	661799.34	320	rust
IGW-16	1009820.48	662069.09	326	rust
IGW-17	1008989.06	659160.91	315.5	rust
IGW-18	1011447.25	660533.99	376.2	rust
IGW-19	1011441.14	660803.89	378.3	rust
IGW-21	1010835.99	660053.08	350.1	rust
IGW-22	1010716.51	660755.41	352.9	rust
IGW-23	1010734.21	660812.68	352	rust
IGW-24	1009879.07	659134.53	331.4	rust
IGW-25	1010037.44	659223.83	330.5	rust
IGW-26	1009968.67	659399.01	335.1	rust
IGW-27	1009799.37	659406.12	332.1	rust
IGW-28	1009043.85	659528.90	332.9	rust
IGW-29	1009089.77	659653.88	332.6	rust
IGW-30	1009048.40	659767.03	333.7	rust
IGW-31	1008933.67	659675.83	331.5	rust
IGW-32	1009244.50	662382.75	316	rust
IGW-33	1009334.26	662535.09	316	rust
IGW-34	1009002.71	662462.23	309.3	rust
IGW-35	1009034.06	662293.31	307.4	rust
IGW-36	1010843.01	661952.87	349.4	rust
IGW-37	1010723.68	662003.58	348.8	rust
IGW-38	1010634.29	661984.79	348	rust
IGW-39	1010646.38	661907.71	350.2	rust
IGW-40	1010694.97	660858.07	348.4	rust
IGW-41	1010703.85	661088.31	349.2	rust
IGW-42	1010596.21	661370.13	367.6	rust
IGW-43	1010440.73	661097.48	348.9	rust
IGW-44	1010448.64	660725.20	349.2	rust
IGW-45	1010592.02	660603.30	348.8	rust

Table 2-9. Summary of Civil Survey for Sample Locations
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample Number	Northing	Easting	Elevation (ft above msl)	Sample by
IGW-46	1010239.08	660715.53	345.9	rust
IGW-47	1010249.76	660883.23	346	rust
IGW-48	1010108.75	660793.62	345.8	rust
IGW-49	1010239.88	660999.63	346.5	rust
IGW-51	1010097.39	661149.10	346	rust
IGW-52	1010209.46	661299.73	346.3	rust
IGW-53	1010207.52	661388.53	346.6	rust
IGW-54	1010148.77	661404.86	346.7	rust
IGW-55	1010149.42	661300.99	346.8	rust
IGW-56	1010374.16	661636.04	353.3	rust
IGW-57	1010254.75	661674.61	353.5	rust
IGW-58	1010140.17	661642.27	353.5	rust
IGW-59	1010249.96	661524.58	353.7	rust
IGW-60	1010835.96	659951.15	345.9	rust
IGW-61	1011064.23	659007.96	325.3	rust
IGW-62	1011396.26	661869.71	336.6	rust
IGW-63	1010488.35	660131.49	345.3	rust
IGW-66	1010591.93	660302.76	348.11	saic
IGW-67	1010294.40	661256.32	347.87	saic
IGW-70	1010212.48	659447.10	341.18	saic
IGW-72	1009890.42	661790.71	341.69	saic
IGW-73	1010257.68	662474.55	324.98	saic
IGW-74	1009900.07	658805.67	321.19	saic
IGW-77	1009845.73	661117.43	344.77	saic
IGW-78	1009783.19	661634.71	338.42	saic
IGW-89	1009087.58	660154.70	325.76	saic
IGW-97	1009314.34	661714.14	317.78	saic
IGW-98	1008908.39	659849.27	332.58	saic
IGW-99	1010096.71	660102.61	340.31	saic
IGW-100	1010605.21	660195.28	347.7	saic
MW-28	1011352.04	658864.36	332.45	saic
MW-29	1011433.61	660202.19	371.76	saic
MW-30	1011371.47	661827.80	339.83	saic
MW-31	1010878.43	659475.60	339.02	saic
MW-32	1010848.75	660072.82	356.04	saic
MW-33	1010671.15	660307.10	347.13	saic
MW-34R	1010750.52	660805.39	355.4	saic
MW-35	1010462.98	660211.91	348.96	saic
MW-36	1010499.88	658895.89	321.09	saic
MW-37	1010571.44	659303.04	339.71	saic
MW-38	1010407.27	661364.96	355.75	saic
MW-39	1010250.71	658858.08	317.59	saic
MW-40	1010008.42	659171.67	329.78	saic
MW-42	1010104.64	660494.39	347.28	saic
MW-43	1009967.25	660887.09	348.28	saic
MW-44	1010079.44	661343.70	349.12	saic
MW-45	1009978.59	658821.89	320.21	saic
MW-47	1009461.80	659156.56	340.47	saic
MW-48	1009390.19	659539.10	335.89	saic
MW-49	1010005.42	659969.23	336.99	saic
MW-4B	1007286.99	659208.11	281.95	saic
MW-51	1009618.45	661053.39	345.78	saic
MW-55	1009281.59	658794.49	324.13	saic
MW-56	1009236.92	658959.83	329.6	saic
MW-57	1009399.79	659918.22	332.32	saic
MW-58	1009003.47	659930.89	331.26	saic

Table 2-9. Summary of Civil Survey for Sample Locations
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample Number	Northing	Easting	Elevation (ft above msl)	Sample by
MW-60	1009663.83	660561.74	344.72	saic
MW-61	1009308.04	660842.21	336.74	saic
MW-62	1009254.60	661376.05	330.19	saic
MW-63	1008653.05	659022.99	298.75	saic
MW-64	1008683.78	659447.32	324.1	saic
MW-65	1008448.69	659420.21	315.55	saic
MW-66	1008464.82	659701.15	322.55	saic
MW-67	1008562.57	660030.17	313.17	saic
MW-68	1008889.80	660612.43	343.75	saic
MW-69	1008544.683	660976.4551	335.01	saic
MW-70	1008560.46	661429.51	320.3	saic
MW-71	1008914.13	661855.19	308.8	saic
MW-72	1009087.00	662667.60	310.78	saic
MW-73	1009534.23	661782.87	323.6	saic
PZ-1	1010971.39	658986.27	322.6	rust
PZ-2	1011352.85	661746.59	351	rust
PZ-3	1009930.01	660709.40	343.8	rust
PZ-4	1009236.17	660709.07	334.1	rust
PZ-5	1008907.39	659173.21	308.2	rust
PZ-6	1008681.53	661729.58	304.9	rust
ISL-201	1009981.391	658828.9798	318.44	saic
ISL-202	1010094.194	658838.3097	314.98	saic
ISL-203	1010145.505	658818.8493	314.25	saic
ISL-204	1010136.392	658742.0048	313.16	saic
ISL-205	1010158.553	658696.3346	312.75	saic
ISL-206	1010214.919	658904.6665	315.49	saic
ISL-207	1010587.794	659957.7091	345.84	saic
ISL-208	1010456.922	660121.5378	346.22	saic
ISL-209	1010107.138	661268.2216	347.23	saic
ISL-210	1009979.206	661320.6514	346.71	saic
ISL-211	1009911.036	661449.2545	343.69	saic
IGW-201	1010329.739	658534.0045	331.44	saic
IGW-202	1009996.896	658572.7913	325.18	saic
IGW-203	1009903.533	658612.7632	313.04	saic
IGW-204	1009743.268	658615.2954	311.96	saic
IGW-205	1010283.017	659670.6077	341.28	saic
IGW-206	1010225.956	659933.8578	340.3	saic
IGW-207	1008220.991	661006.7145	318.52	saic
IGW-208	1007972.058	661132.8362	312.9	saic
IGW-209	1008286.957	661244.613	317.53	saic
ISW-202	1008630.727	660088.0174	309.09	saic
ISW-203	1008401.174	659923.7983	301.24	saic
ISW-204	1007941.781	659787.9332	292.17	saic
MW-62A	1009254.711	661395.378	328.1	saic
MW-70A	1008575.813	661444.3404	318.2	saic

- Contaminated Nonhazardous, Return to Ground: Soil or liquid with detections of volatile organic analytes (VOAs) or semivolatile organic analytes (SVOAs) not exceeding TCLP or Georgia HSRA Type 1 or Type 3 RRS or metals above two times (2X) background. 123 drums of soil IDW were grouped into this category.

- Noncontaminated, Nonhazardous, Return to Ground: Soils with no VOA or SVOA detects and no metals above 2X background. 69 drums of soil IDW were grouped into this category.

Recommendations were made to the United States Army Corps of Engineers (USACE) concerning disposition of the IDW (SAIC 1999). Following receipt of USACE concurrence, the disposal was carried out. The schedule of disposition for IDW was as follows:

Date	Number of Drums	Media	Method of Disposal
6/18/99	3	Liquid	Hazardous for Incineration
6/18/99	9	Liquid	Hazardous for Subtitle D and Landfill Disposal
6/18/99	11	Soil	Nonhazardous offsite disposal
6/18/99	42	Liquid	Non-hazardous for pretreatment/offsite disposal
5/24-5/26/99	192	Soil	Return to ground

Table 2-10 is the final drum inventory for the MNOP investigation (AIP and Landfill) following on-site disposal of non-contaminated and slightly contaminated material. Appendix L contains IDW disposal records. Field notes concerning IDW handling and disposal can be found in Appendix A.

Five drums of soil and 14 drums of liquid IDW were generated during the 2000 SAIC investigation. SAIC reviewed the associated data following the same procedures used for evaluating the previous IDW and made recommendations to the USACE project manager regarding disposal. USACE approval was granted during the week of August 7, 2000. IDW pickup and disposal is scheduled for the week of August 14, 2000.

Table 2-10. Final Drum Inventory for the Former Macon Naval Ordnance Plant

Soil (Hazardous; Profile # 3004574)

Contents	Quantity
MW-13	1
MW-15	1
Total	2

Soil (Nonhazardous; Profile # 3004575)

Contents	Quantity
ISL-126	1
ISL-117	1
ISL-116	1
ISL-115	1
MW-39	1
MW-45	2
MW-36	1
MW-44	3
Total	11

Liquid (Hazardous for Subtitle D landfill disposal; Profile #

Contents	Quantity
MW-56	3
MW-64	2
MW-65	1
MW-66	1
MW-56, -55, -70, -69, PZ-6	1
MW-66, -64, -65, -63, -12, PZ-5	1
Total	9

Liquid (Hazardous for inceration; Profile # 3004573)

Contents	Quantity
MW-15	2
MW-67, -71, -40, -47, -45, -39	1
MW-13, -4, -11, -2, -2B, -4B	1
MW-45	1
MW-47	1
Total	6

Liquid (Nonhazardous; Profile # 3007572)

Contents	Quantity
MW-4B	4
MW-12	1
MW-13	1
MW-2B	1
MW-72, -73, -44, -60, -62, -49	1
MW-30, -29, -28, -33, -32, PZ-2	1
MW-34R, -35, -31, -37	1
MW-57, -61, -68, PZ-3, PZ-4	1
MW-29	2
MW-30	1
MW-62	1
MW-72	2
MW-69	2
MW-38	1
MW-70	1
MW-40	1
MW-28	1
MW-60	1
MW-48	2
MW-57	2
MW-42	1
MW-32	1
MW-73	2
MW-49	1
MW-35	1
MW-31	2
MW-33	2
MW-35	1
MW-63	1
MW-68	1
MW-71	1
MW-58	1
MW-51	1
MW-44	1
MW-43	1
MW-67	1
MW-34R	2
Total	49

3.0 HYDROGEOLOGIC INVESTIGATION RESULTS

3.1 Physical Characteristics

During the AIP investigation, a significant amount of data were collected to characterize the physical setting of the site. These data fall into the categories of geology (coring data and geotechnical data), and hydrogeology (slug tests, potentiometric data, laboratory permeability tests). These physical characteristics are described in the following sections.

3.1.1 Regional Geologic Setting

Rust conducted a preliminary site investigation of the AIP site in 1996, hereafter referred to as the 1996 Site Investigation and produced a Site Investigation Report (Rust 1997). In the report, they provided a discussion of regional and local geology and hydrogeology, and the results and conclusions of the investigation. The following regional geology discussion is based on the Rust report (Rust 1997).

The MNOP property is located in Bibb County, within the Fall Line Sand Hills of the Coastal Plain physiographic province in central Georgia. The site lies approximately 10 mi south of the Piedmont physiographic province, which is underlain by crystalline bedrock of Paleozoic and older age. The Coastal Plain province is composed of Cretaceous and younger unconsolidated sediments, limestone, and sandstone rock that overlie the older bedrock of the Piedmont province. These deposits commonly dip and increase in thickness toward the southeast. The Fall Line Sand Hills region, which extends in a northeastward-trending belt across Georgia, exhibits a distinctive topography of light colored sandy hills that rise to nearly 800 ft msl in Taylor County to the southwest. Topographic relief within the region can reach 300 ft. The sandy mantle of the Fall Line Sand Hills region is loose, incoherent, and very hilly. Streams are more widely spaced relative to the Piedmont province, and cut deep, precipitous gullies that actively erode sand from upland areas. Hence, sand is removed from the gully heads by rain-wash and deposited in the gully bottoms as subaerial deltas (LeGrand 1962).

In ascending order, the rock units in the vicinity of the MNOP include: pre-Cretaceous igneous and metamorphic rocks, Cretaceous sediments, and Quaternary alluvium. The igneous and metamorphic rocks of Paleozoic and older age comprise granites, biotite-granite gneisses, and minor occurrences of altered volcanics and slate (LeGrand 1962). Figure 3-1 presents a stratigraphic column of the regional geology.

The Cretaceous-aged Tuscaloosa formation is the principal surficial geologic unit at the MNOP. The formation consists of light-colored sand, sandy clay, and discontinuous clay lenses. According to LeGrand (1962), the formation does not indicate regular or cyclic deposition and is poorly developed and discontinuous, with no individual beds being traced far. In keeping with the regional trend, the Tuscaloosa thickens to the south with a regional dip of 30 ft per mi. About 9 mi south of the MNOP, it is overlain by younger sediments and attains a thickness of 600 ft. The thickness of the formation under the MNOP has not been measured, but it is probably less than 600 ft (LeGrand 1962).

Quaternary alluvial sediments are the surficial deposits in the floodplains of creeks and rivers in the area. The Quaternary alluvial sediments are interpreted to have been deposited in a meandering stream depositional environment. These deposits consist of two distinct types: a peat/clay overbank unit and a sand and gravel point-bar unit. Under a meandering stream scenario, these two units may be repeated several times within a stratigraphic interval. As point bars migrate laterally, perpendicular to the direction of stream flow, they deposit a fining-upward sequence of cross-bedded gravel, sand, and silt. Eventually, these sediments are situated behind the stream levee and are overlain by swamp and marsh deposits of organic-rich peat and clay. As the stream meanders back across this sequence, a distinctive basal layer of gravel and sand is deposited over the peat/clay unit, and the sequence is repeated. The thickness of the Quaternary deposits south of the MNOP have not been measured, but may extend to 60 ft bls.

3.1.2 Conceptual Geologic Model

The southernmost part of the city of Macon is built on a tongue-shaped peninsula surrounded by the floodplains of Rocky Creek and the Ocmulgee River on three sides (west, south, and east). The AIP resides on the southern tip of this tongue. Consequently, the land surface at the study area slopes in three directions toward these floodplains. The surface elevation ranges from approximately 375 ft msl in the north-central portion of the site, to 275 ft msl alongside Rocky Creek. An abandoned railroad spur runs from west to east across the southern third of the study area (Figure 3-2). This spur is built along the toe of an alluvial terrace. South of the spur, a younger terrace is evident which extends south to the active floodplain of Rocky Creek. For the purpose of discussion, the upper

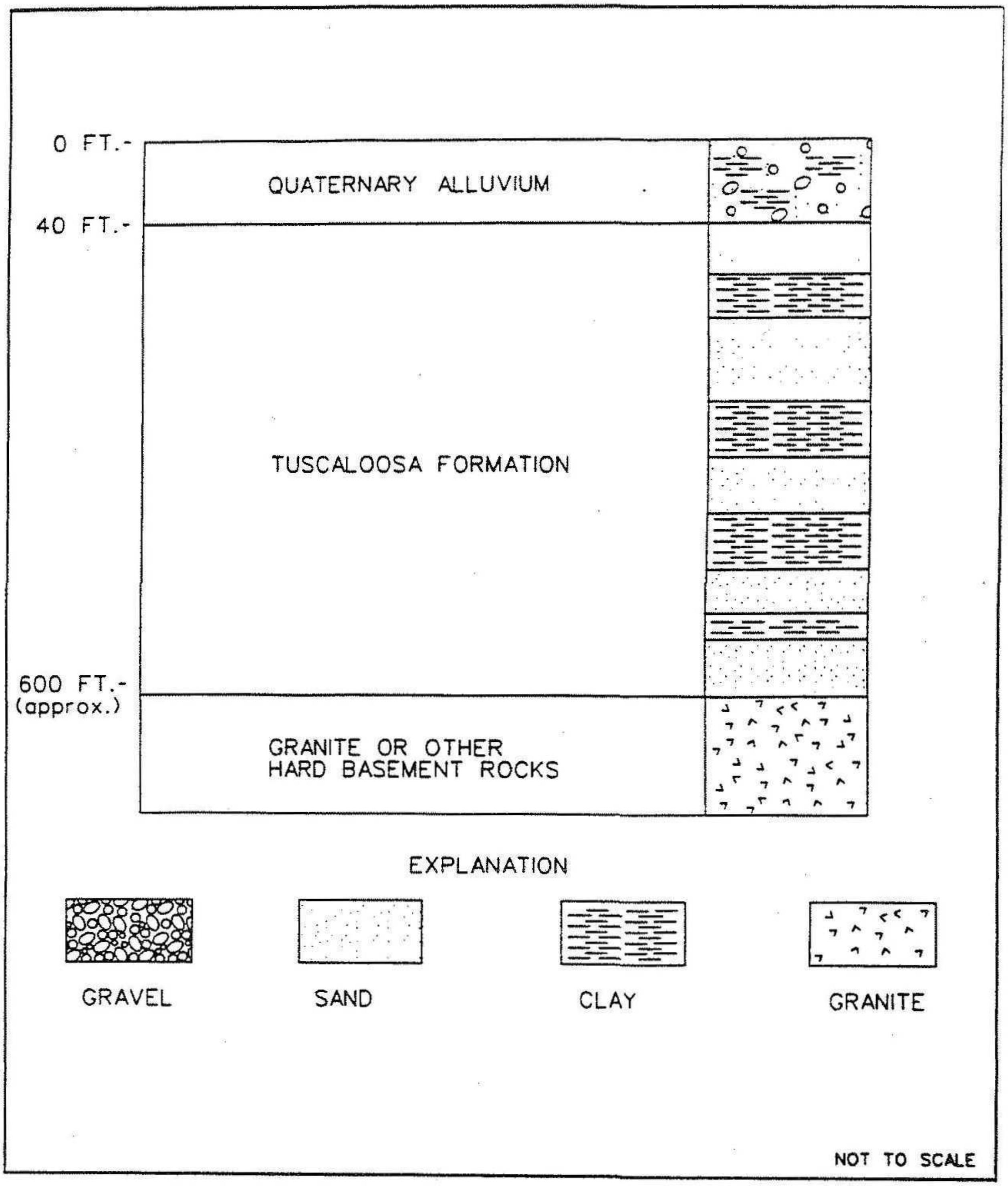

Figure 3-1. Stratigraphic Column

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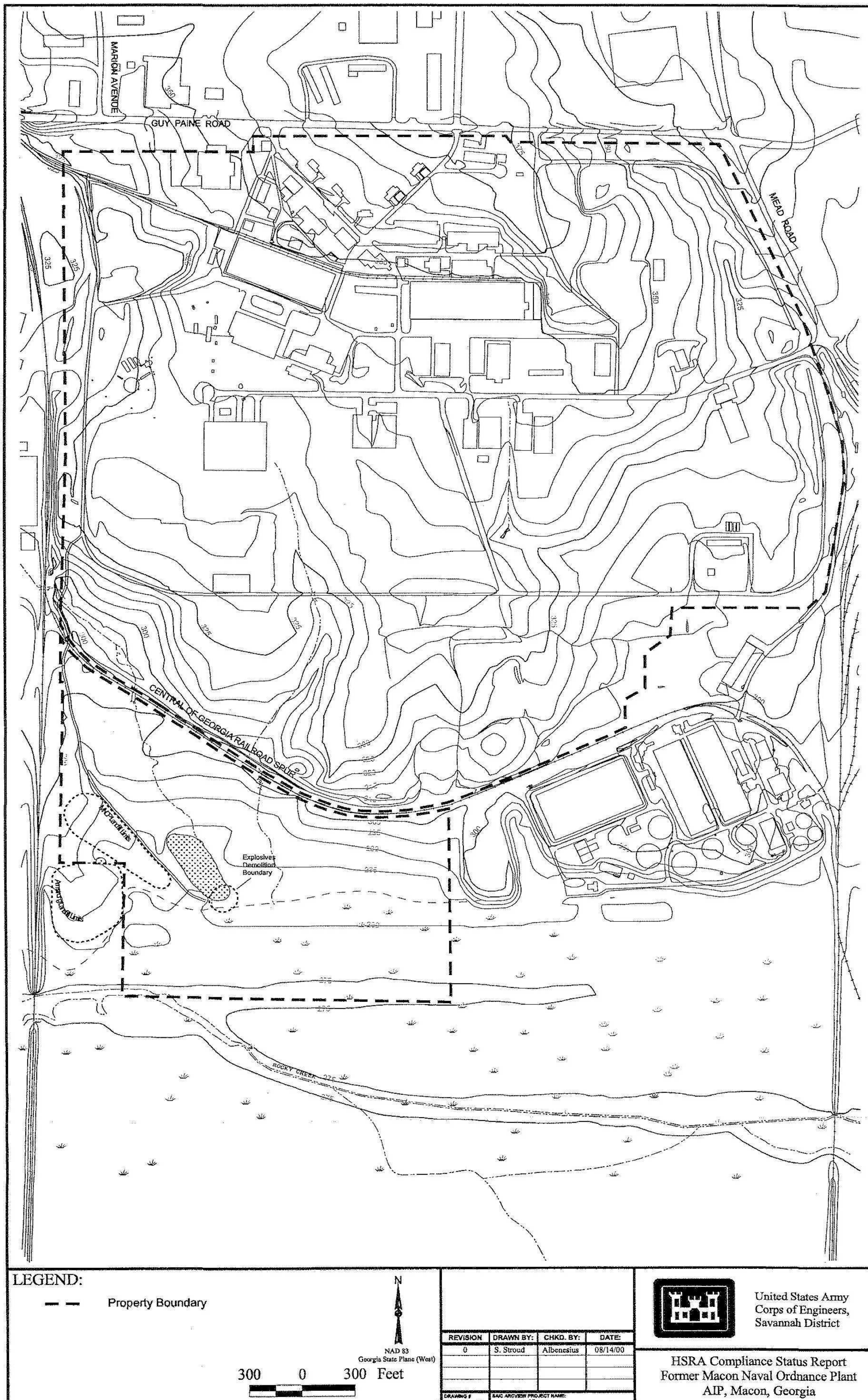

Figure 3-2. Topography of the Allied Industrial Park and Former MNOP Landfill

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terrace is referred to as the AIP terrace and the lower terrace as the MNOP Landfill terrace for the remainder of this report.

The MNOP lies within the drainage basin of the Ocmulgee River. The Ocmulgee is located approximately 2.6 mi east of the site, flowing through eastern Bibb County. The floodplain of the Ocmulgee is generally about 2 mi wide. All streams flowing into the Ocmulgee have a predominantly southeast course. Almost all small tributaries flow southward to join the larger creeks at an acute angle (LeGrand 1962).

Within the vicinity of the site, the dominant drainage feature is Rocky Creek, which is approximately 800 ft south of the southern boundary of the AIP property. This stream exhibits a well developed floodplain, which borders the former MNOP property and enters Tobesofkee Creek about 1 mi southeast of the site. Tobesofkee Creek forms a confluence with the Ocmulgee River 5 mi farther to the southeast (Figure 3-2).

Surface water runoff at the MNOP generally follows the land topography, which slopes gently southward across the site. A small tributary enters the property at the northeast corner and runs parallel to Mead Road before it exits the site south of Allied Industrial Boulevard. A few drainage ways exist in the former bunker area where storm water drain outfalls empty onto the field. A topographic low occurs in the northwest section of the site, where surface drainage appears to run off during storm events into a small creek along the west property boundary. This creek eventually crosses the road connecting the AIP to the Landfill site and becomes a drainage easement. This drainage easement was sampled during the 1996 and 1998 investigations. The drainage flows under the former Central of Georgia Railroad spur in the southwest portion of the property, and empties into Rocky Creek in a wooded area south of the site.

Using data from the coreholes and monitoring well borings, six geologic cross sections were developed to characterize the subsurface across the AIP and MNOP Landfill. The six cross section lines, labeled A-A' through F-F', are depicted on Figure 3-3. Cross sections A-A' through C-C' are west to east trending sections that cut across the northern, middle, and southern portions of the AIP. Sections D-D' through F-F' are south to north or southwest to northeast trending sections which begin adjacent to the Rocky Creek floodplain, cross the Landfill, and extend across the west, middle, and east parts of the AIP. These cross sections are provided in the following pages as Figures 3-3 through 3-9.

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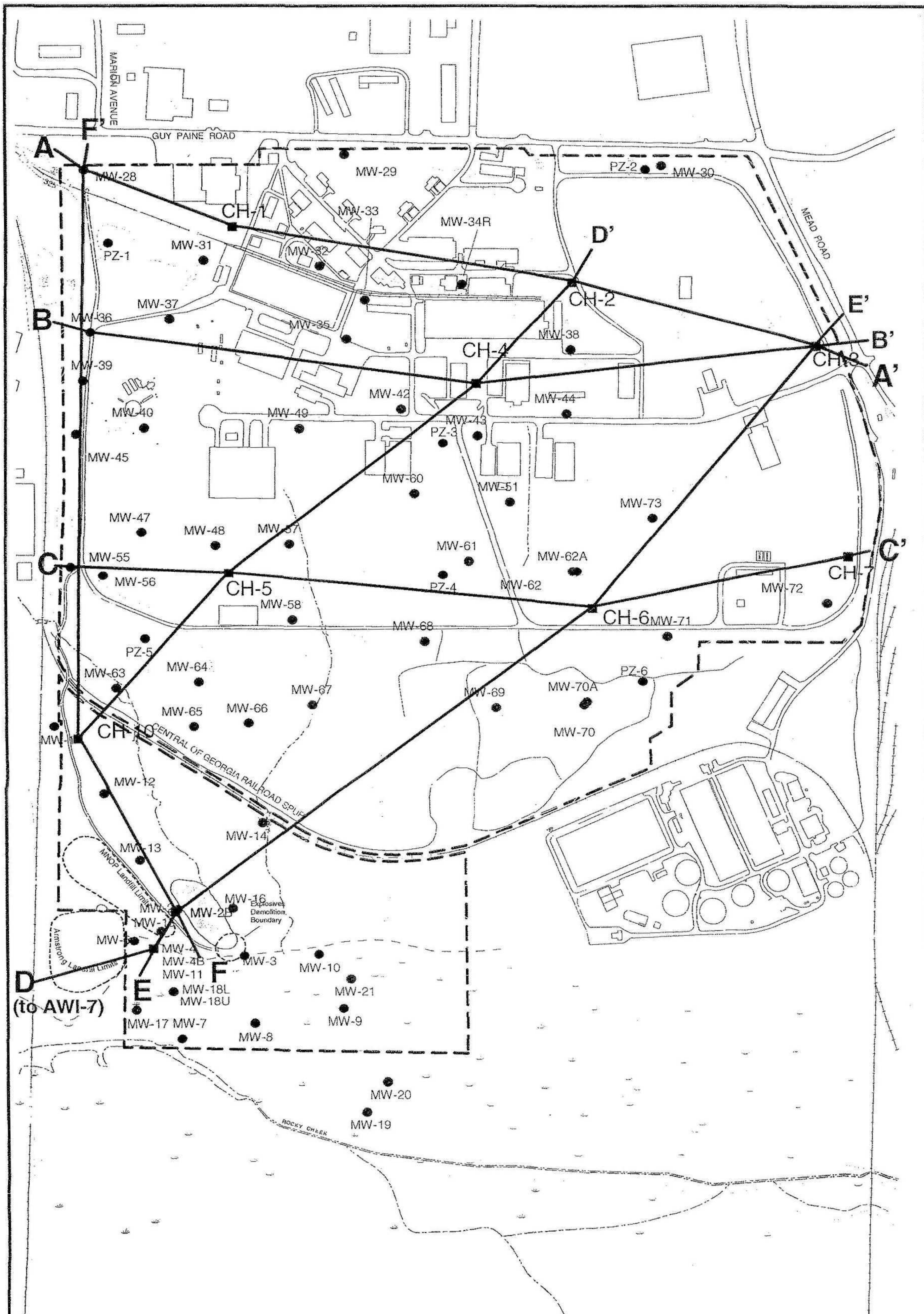

Figure 3-3. Cross Section Lines

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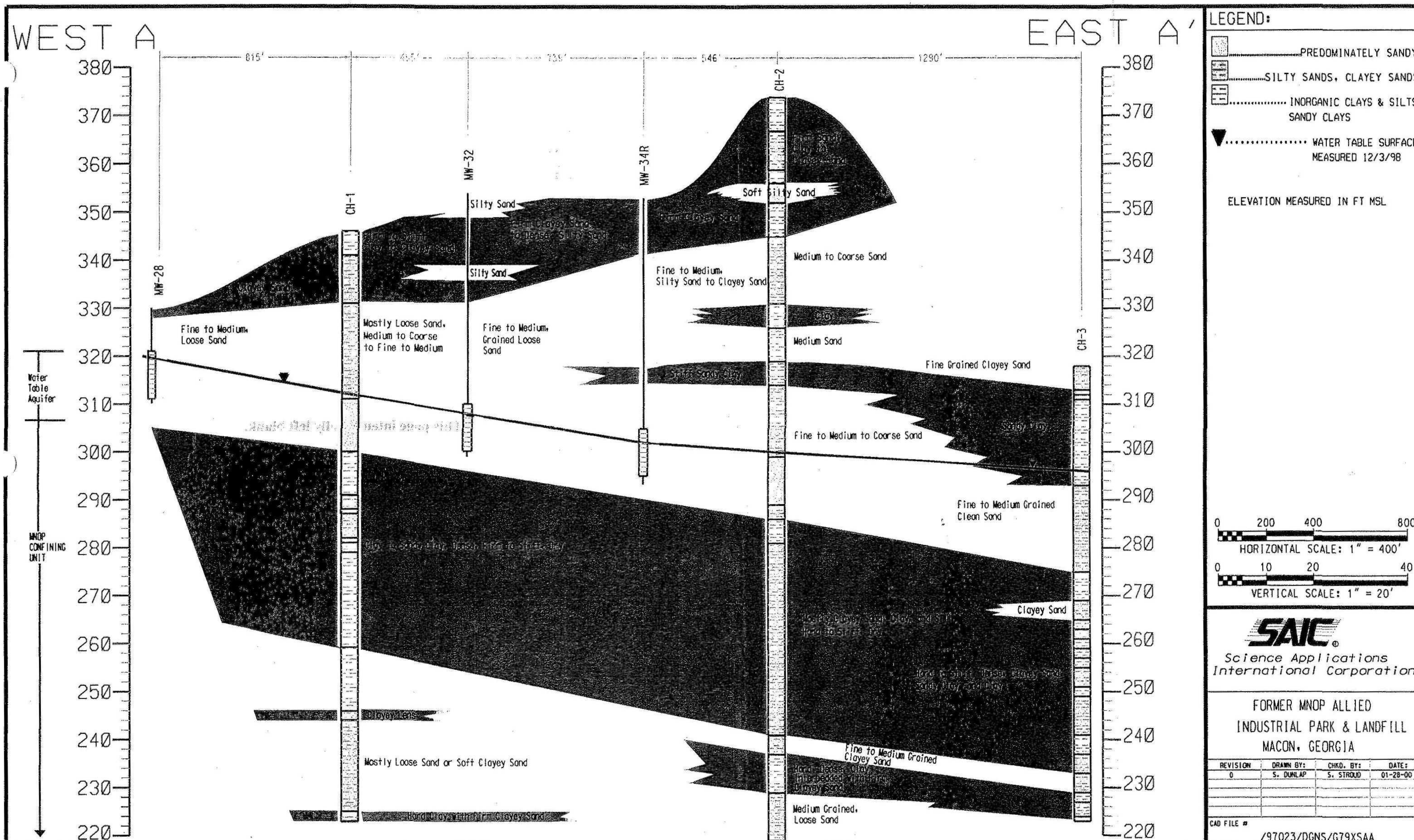

FIGURE 3-4. CROSS SECTION A-A'

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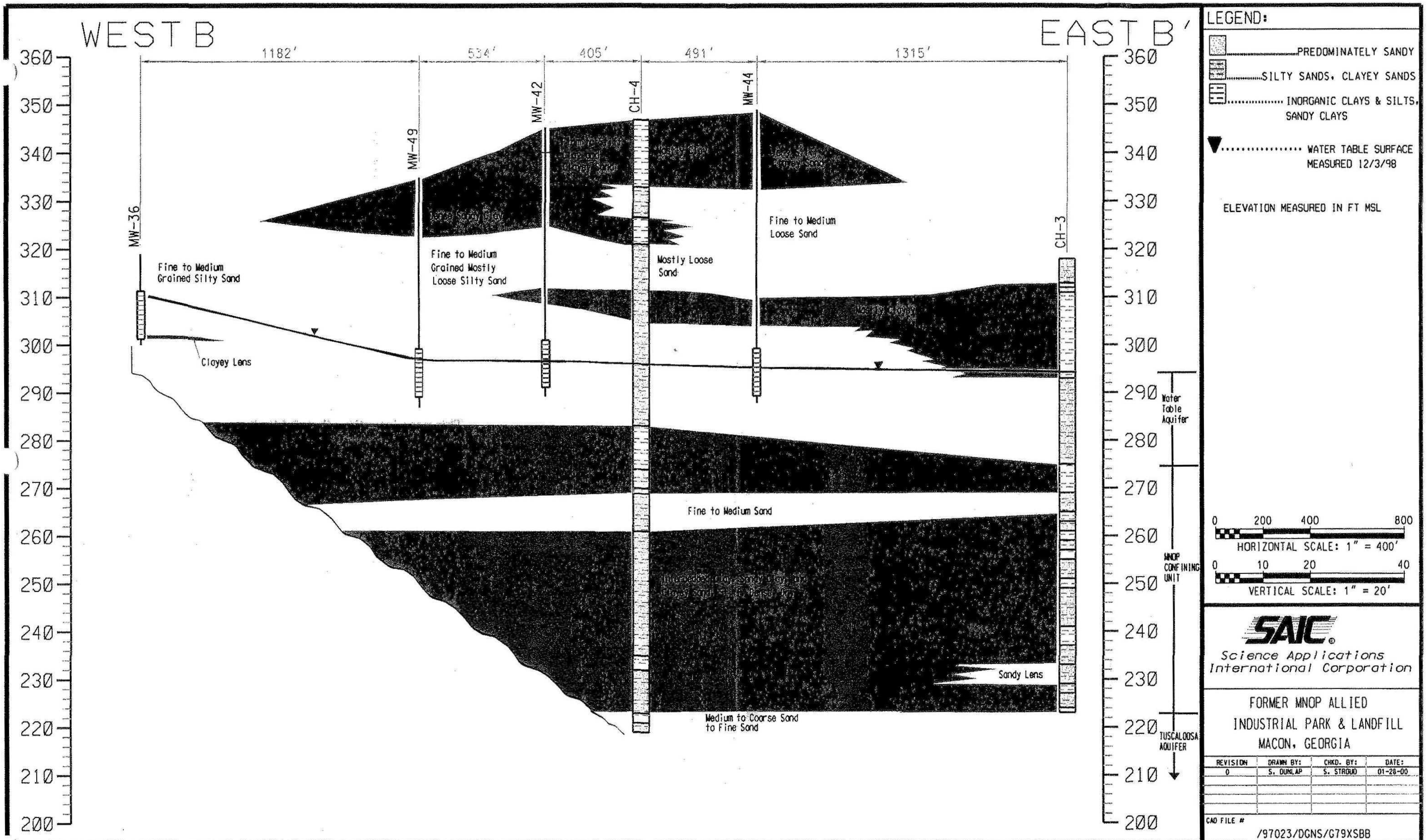

FIGURE 3-5. CROSS SECTION B-B'

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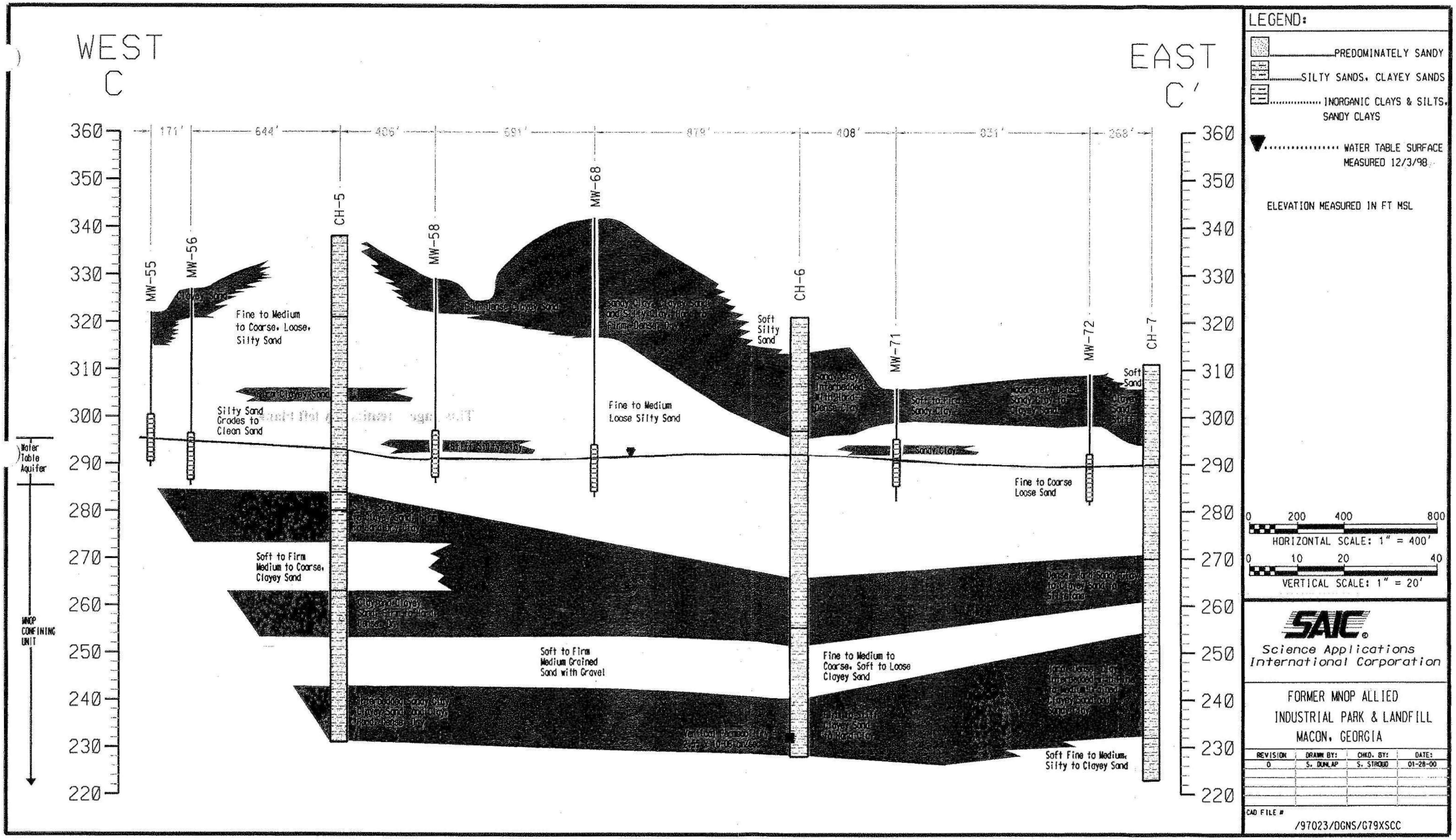

FIGURE 3-6. CROSS SECTION C-C′

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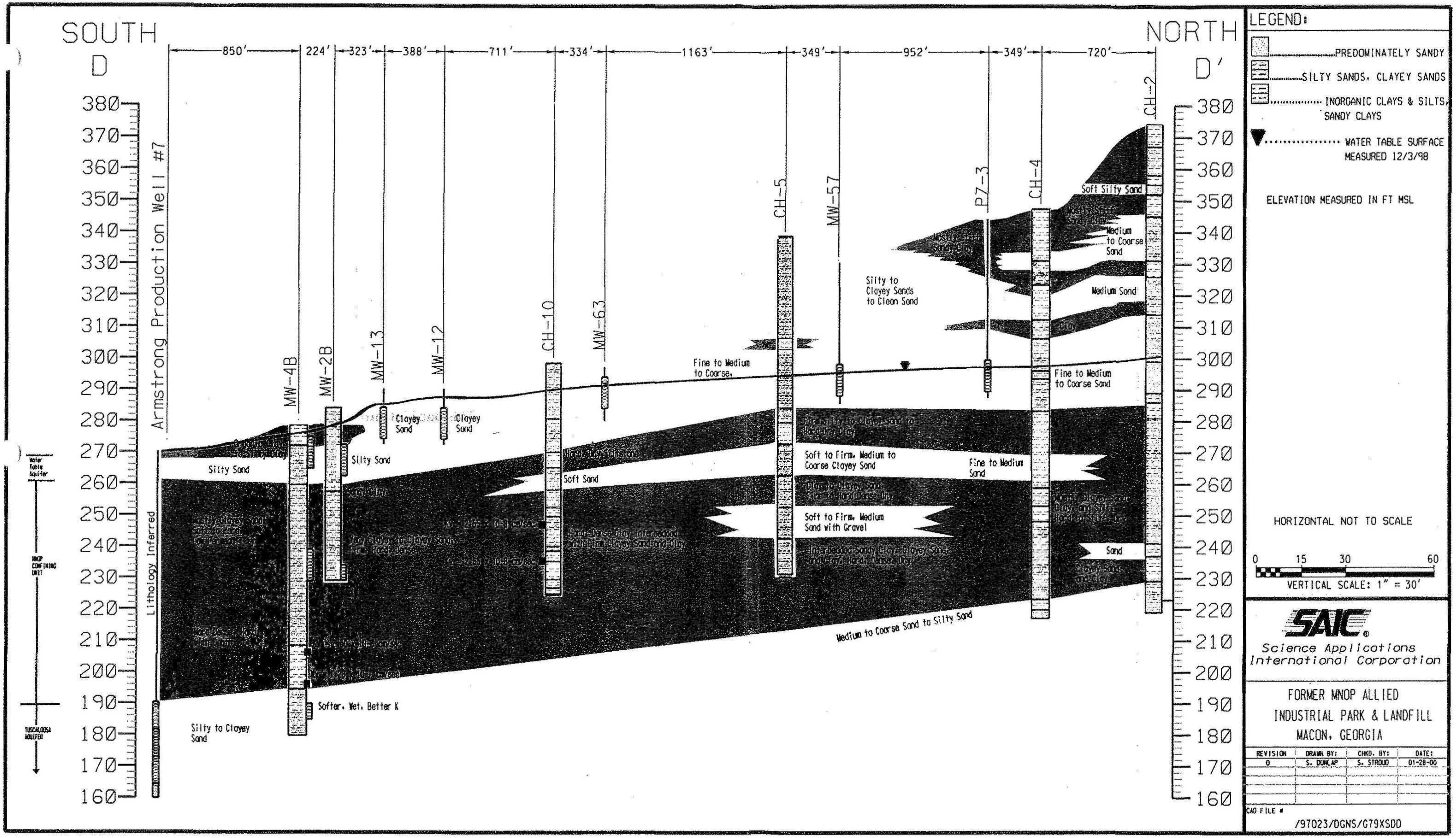

FIGURE 3-7. CROSS SECTION D-D'

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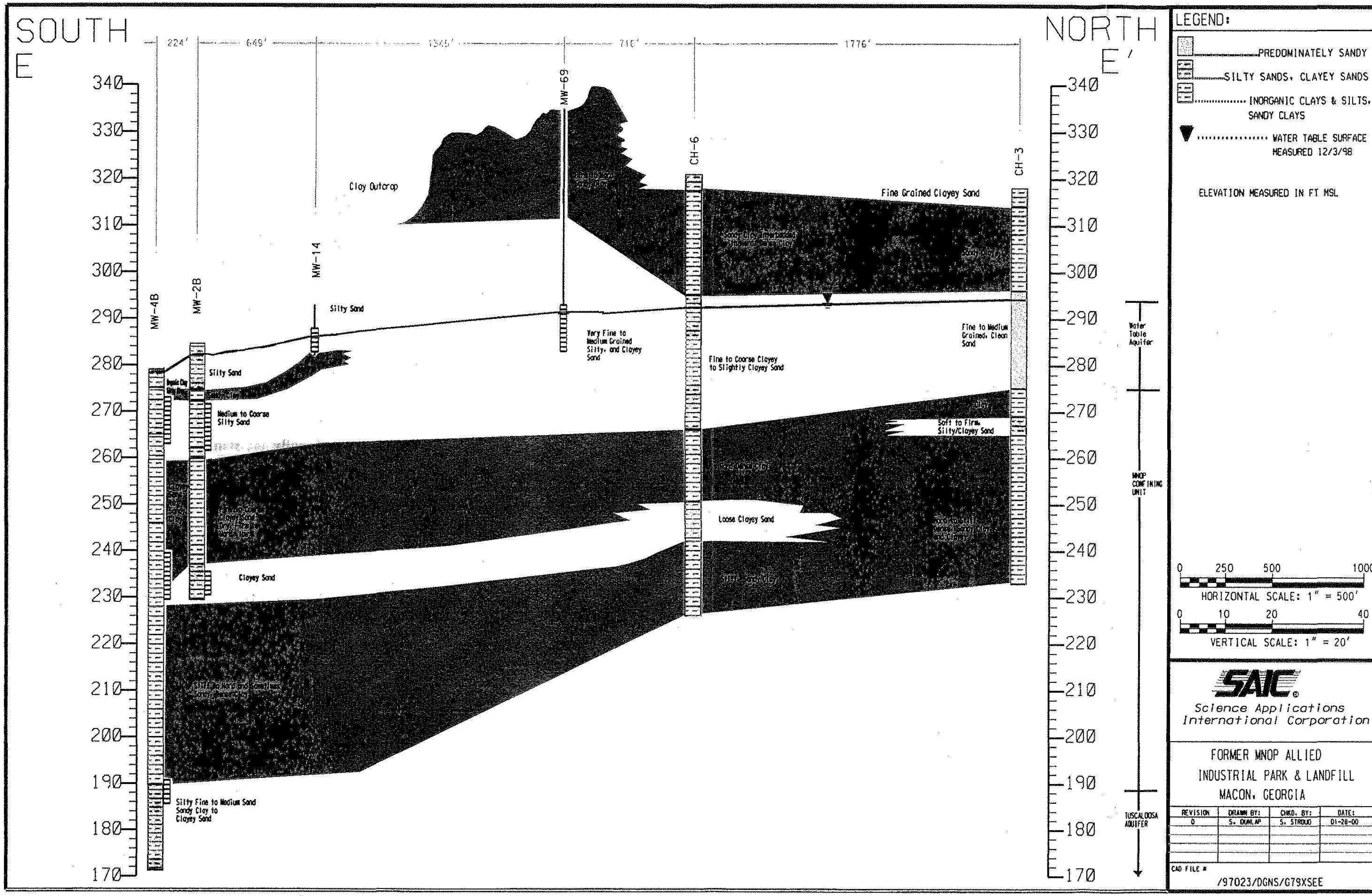

FIGURE 3-8. CROSS SECTION E-E'

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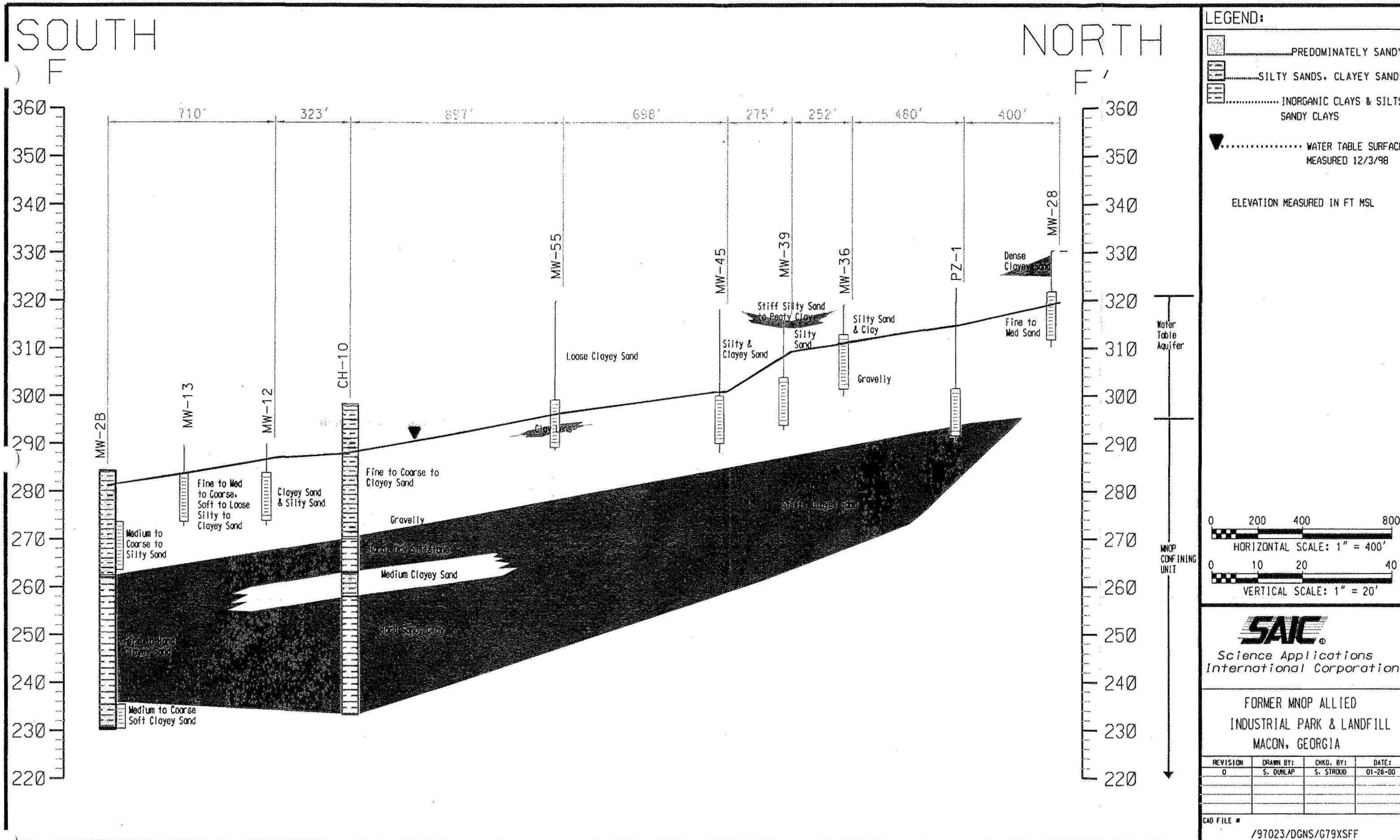

FIGURE 3-9. CROSS SECTION F-F'

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From the detailed geologic logs, and the corresponding geologic cross sections, the following significant units were identified (in descending order) below the AIP:

- A thin horizon of weathered soil which includes both clayey/silty, and sandy facies
- A predominantly sandy unit in which the water table resides (Water Table Aquifer)
- A laterally continuous and significantly thick sequence of interbedded clays, sandy clays, clayey and silty sands, mudstone, and sands (MNOP Confining Unit)
- A predominantly sand unit which appears to correlate with the regionally significant sand aquifer known as the Tuscaloosa (Tuscaloosa Aquifer)

The uppermost unit is a dominantly clayey unit that appears in the borings located at the topographically highest points of the study area. This resistant, interfluvial area, forms the tongue of the south Macon peninsula. The unit was encountered in coreholes CH-1, -2, -4, and -5. It is described as a moderate reddish brown, sandy, firm, clay, to clayey to very clayey, dense, stiff sand at CH-1, with a thickness of 15 ft, from a ground surface elevation of 346.2 ft msl. At CH-2, the unit is described as a moderate reddish brown, soft, sandy clay, to firm, very clayey sand, to a moderate reddish orange to very light gray, dense, hard, dry clay, to a pale red to dark yellowish orange, soft, silty clay, with a thickness of 29 ft, from a ground surface of 373.9 ft msl. At CH-4, the unit is described as a moderate reddish brown, stiff, sandy clay to a pinkish gray to very light gray, stiff, silty clay, with a thickness of 26 ft, from a ground surface elevation of 346.5 ft msl. At CH-5, which has a ground surface elevation of 337.5 ft msl, which is in the range of elevations where the top unit was encountered in other borings, the unit was not particularly clayey. It is described as a dark yellowish orange to moderate reddish brown to grayish orange and light gray, fine to medium grained, clayey sand. The unit was not encountered at other coreholes where the land surface is below the remnants of the unit.

Above (north) the old railroad spur (AIP terrace and highland), the weathered soil horizon of hard sandy clay and clayey sand is evident. Below the spur, active sedimentation is evident and the sandy material of the Water Table Aquifer is exposed. In keeping with Legrand's model (Figure 3-1), this surficial clayey unit is likely a combination of the hard, plinthic soil common to the upper Coastal Plain, and the remnant of a clay zone within the Tuscaloosa Formation.

The sandy unit in which the Water Table Aquifer resides, was encountered in all of the ten coreholes. Its thickness ranges from 59 ft near the high-point of the site (CH-2), to 17 ft at MW-4B, adjacent to the Rocky Creek floodplain. The elevation of the bottom of the unit ranges from 300.2 to 259.4 ft msl. Across the northernmost part of the AIP, the unit is described as a grayish pink to dark yellowish orange to very pale orange, medium to coarse grained, firm to mostly loose, slightly clayey to clean sand. Gravelly beds are common throughout the unit. At CH-2, two 5 ft thick clayey layers were noted within the unit. Across the central (west-east) portion of the AIP site, the unit is described as dark yellowish orange to very pale orange to pale yellowish orange to very light gray, fine to medium to coarse (fining upward), clayey to silty to clean, sand. Significant interbeds of clay were noted at CH-3 (20 ft thick) and at CH-4 (3 ft thick). Across the southern portion of the AIP, the unit is finer grained overall, but again coarsens with depth. At CH-6, a 20 ft thick interbed of sandy clay to clay was noted and at CH-7, a 10 ft thick interbed of stiff, clayey sand was noted. Down on the Landfill terrace, the unit is described as pale yellowish orange to moderate reddish orange to very light gray (CH-10) to brownish gray and grayish brown to yellowish gray and light gray (MW-2B/MW-4B), fine to medium to coarse, silty to clean, loose sand. Near the surface, the unit is richly organic. The unit is gravelly near its base. The portion of the unit that is saturated is referred to throughout the remainder of this report as the Water Table Aquifer.

At all corehole locations, a distinctly clayey unit was encountered at the base of the Water Table Aquifer. This unit was mapped across the study area as a laterally continuous, thick, sequence of clay, very clayey sand, and siltstone, with some interbeds of mostly sandy material. The top of the unit ranges from 300.2 ft (CH-1) to 259.4 (MW-2B) ft msl indicating that it slopes from the high point of the northern AIP toward the Rocky Creek floodplain. Figure 3-10 is a structure contour map of the top of the confining unit. The thickness of the unit ranges from 39 ft at CH-7 to over 77 ft at CH-1 where it was not cored through. The dominant color in the sequence is very light gray with common occurrences of pale red and grayish pink. Laminae of dark yellowish orange and moderate reddish orange are also common. Lithologies within the sequence range from dense, stiff to hard, dry clay, to hard, indurated, siltstone, to firm to hard, clayey to very clayey sand. Interbeds of mostly sandy material were encountered in CH-1 (13.5 ft and 21 ft), CH-2 (3.5 ft), CH-3 (4 ft), CH-4 (8 ft), CH-5 (10 ft and 10 ft), CH-6 (11 ft), CH-7 (6.5 ft), CH-10 (5 ft), and MW-4B (8 ft). These sand interbeds are mappable across the AIP in cross sections B-B' and C-C'. Cross section E-E' which trends from south to north beginning in the Landfill, also depicts a somewhat continuous sandy layer within the confining unit sequence. For the remainder of this report, the thick clayey sequence, just described, is referred to as the MNOP Confining Unit.

For the remainder of this report, the sand encountered below the base of the MNOP Confining Unit is referred to as the Tuscaloosa Aquifer. At several locations, the MNOP Confining Unit was fully penetrated, and coring is believed to have encountered the top of the Tuscaloosa Aquifer. At CH-2, at a depth of 145 ft bls (228.9 ft msl), a moderate orange pink to very light gray to pale yellowish

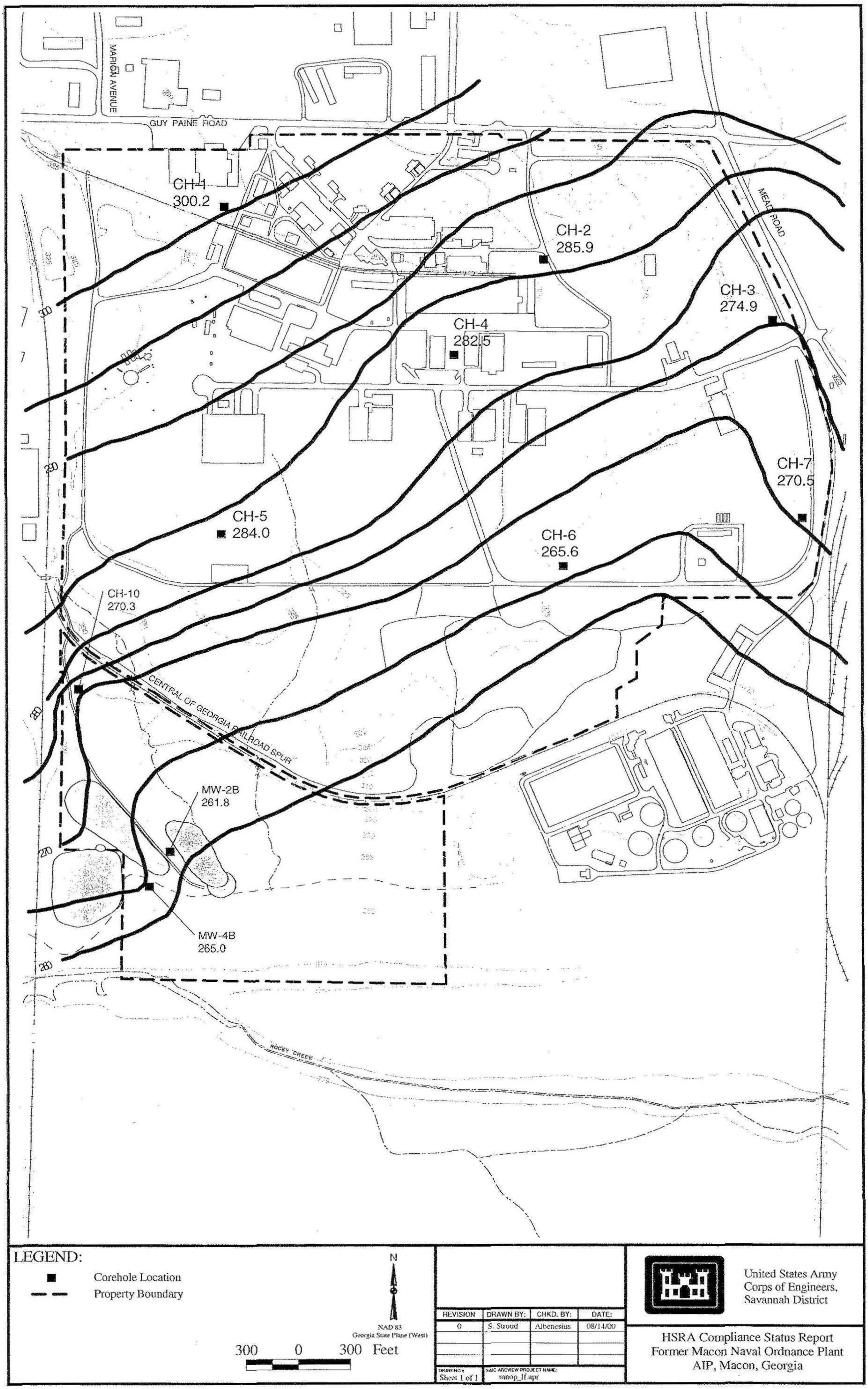

Figure 3-10. Structure Contour Map of the Top of the MNOP Confining Unit

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orange, medium grained, slightly clayey to clayey to silty, soft to loose, sand was encountered. Ten ft of this sand was cored before terminating the boring. At CH-4, at a depth of 124 ft bls (222.5 ft msl), a pink, medium to coarse grained, silty sand, interbedded with a thin (1.5 ft) clay bed, was encountered. At CH-7, at a depth of 79 ft bls (231.5 ft msl), a very light gray, fine to medium grained, silty to clayey, soft, sand was encountered. At MW-4B, at a depth of 90 ft bls (189.5 ft msl), a grayish pink to white, fine to medium grained, loose, silty to clayey sand was encountered.

At CH-1, a sand unit was encountered at a depth of 102 ft bls (244.2 ft msl). This corehole bottomed out in 2 ft of a very fine grained, firm, clayey sand. This firm bed may indicate that the sand encountered at 102 ft bls is a sandy lens within the MNOP Confining Unit. It might otherwise be a clayey lens within the Tuscaloosa Aquifer, indicating that the top of the aquifer at that location is at 244.2 ft msl.

Well construction information is provided for 12 local production wells in Table 3-1. These wells are all reported to be screened in the sand beds of the Tuscaloosa aquifer. The tops of the uppermost screens in 10 of the 12 wells range from 220 ft msl to 160 ft msl. Two of the wells located on Riverwood property (east of the Landfill) have well screens that start at 250 ft msl. It is clear that the elevations corresponding to the perceived top of the Tuscaloosa Aquifer in the investigation coreholes described in the preceding paragraph, fall within the range of the reported production well uppermost screen intervals.

Although the regional geology discussion, and the Rust report, characterize all of the subsurface below the study area as Tuscaloosa Formation, it is important to recognize that a significantly thick and laterally continuous zone of low permeability material separates the shallow Water Table Aquifer from the deeper production zones. This characterization will be expanded upon in the following discussion of site hydrogeology and in the nature and extent of contamination, and fate and transport discussions for groundwater.

3.1.3 Hydrogeology

Based upon a literature review and an evaluation of geologic logs from both on-site borings and from deep water-supply wells located off-site, the following hydrogeologic units were defined by Rust (Rust 1997).

- Shallow Water Table Aquifer: The shallow aquifer extends from the water table (5.6 to 47.4 ft bls) to the top of the underlying confining clay unit (the white and pink clay unit). The white and pink clay unit is found generally 50 to 70 ft bls, but locally may be as much as 140 ft bls. The

Table 3-1. Summary of Well Construction Details Obtained from USGS Records
Wells Located Near MNOP and AIP Sites

USGS ID	Well ID	Company	Date Comp.	GS Elev.[1]	Total Depth	Screen 1	Screen 2	Screen 3	Screen 4	Screen 5	Yield	Spec. Capacity	Use	Status
16W024	Armstrong #5	Armstrong Cork	11/23/64	320	243	100 to 105	133 to 153	168 to 173	228 to 243	N/A	465	4.1	Industrial Supply	Active
16W025	Armstrong #4A	Armstrong Cork	11/24/69	290	240	120 to 155	225 to 240	N/A	N/A	N/A	524	7.2	Industrial Supply	Active
16W026	Armstrong #7	Armstrong Cork	3/18/68	270	210	80 to 120	128 to 133	195 to 210	N/A	N/A	305	6.3	Industrial Supply	Active
16W020	Armstrong #3A	Armstrong Cork	5/20/64	320	256	128 to 148	155 to 160	186 to 191	230 to 235	251 to 256	360	2.8	Industrial Supply	Active
16W023	Armstrong #6	Armstrong Cork	10/5/66	303	260	140 to 160	240 to 260	N/A	N/A	N/A	510	7.1	Industrial Supply	Active
16W019	Armstrong #1A	Armstrong Cork	4/15/64	340	238	120 to 145	223 to 238	N/A	N/A	N/A	448	4.9	Industrial Supply	Active
16W005	Armstrong #4	Armstrong Cork	1/19/60	290	285	130 to 140	165 to 180	235 to 245	260 to 265	N/A	632	N/G	Industrial Supply	Abandoned
16W009	16W009	Keebler	10/9/89	N/G	300	150 to 165	175 to 195	250 to 265	280 to 290	N/A	270	11.25	Industrial Supply	Active
16W008	Keebler #1	Keebler	9/1/53	370	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	Industrial Supply	Abandoned?
16W018	Kraft #1	Riverwood	3/27/46	310	244	60 to 70	160 to 170	212 to 217	N/A	N/A	411	8.93	Industrial Supply	Active
16W007	Kraft #2	Riverwood	9/30/68	354	183	100 to 120	135 to 160	178 to 183	N/A	N/A	285	8.63	Industrial Supply	Active
16W027	Kraft #3	Riverwood	9/10/79	315	290	150 to 190	200 to 210	270 to 280	N/A	N/A	250	2.84	Industrial Supply	Active

[1]: Groundsurface elevations are approximate
N/G: Not Given
N/A: Not Applicable
All screen depths given below landsurface.
Specific Capacity in gallons per minute per foot drawdown.
Yield in gallons per minute.

shallow aquifer is comprised primarily of clean sands and silty sands, but contains frequent discontinuous clay intervals and some clayey sand.

- Confining clay and interbedded sand and clay units: This unit is comprised of a distinctive red and pink 12 ft thick clay unit overlying an approximately 60 ft thick sequence of interbedded sand and clay. These strata are encountered between 60 and 140 ft bls (elevations 250 to 180 ft msl). The clay and interbedded sand and clay units may form a confining unit or semi-confining unit to the deeper water producing aquifer zones.

- Tuscaloosa sand aquifer(s): The Tuscaloosa sand aquifer(s) consist of three or more primary water-bearing sands or sequences of interbedded sand and clay separated by clay. This includes a shallow interval, from approximately 130 to 160 ft bls (elevations of 177 to 152 ft msl), and deeper aquifers between approximately 180 ft bls and the base of the Tuscaloosa at approximately 280 ft bls.

The 1998 field investigation results validate the above model. The continuity of the MNOP Confining Unit has been more thoroughly characterized, as have the hydraulic properties of the Water Table Aquifer.

The groundwater flow direction in the shallow Water Table Aquifer, within the MNOP, is generally in a south-southeast direction based on synchronous water levels taken on December 3, 1998. The potentiometric surface map (Figure 3-11) shows a predominant flow direction to the southeast across the AIP, becoming more southerly in the lower terrace, in the Landfill vicinity. Data from CPT pushes on Armstrong World Industries property, indicate that west of the southwest quadrant of the AIP, a low permeability zone exists within the Water Table Aquifer, that may influence the direction of flow in that vicinity. Depth to the water table varies from essentially 0 ft bls in the Rocky Creek swamp, to 58 ft bls at MW-29, upgradient of the AIP. Water table elevations, range from 319.5 ft msl at MW-28, upgradient of the AIP, to 274.3 ft msl at MW-19, in the Rocky Creek swamp, resulting in a gradient of approximately 45 ft over 3,100 lateral ft (0.015).

By comparing structure contours of the top of the MNOP Confining Unit, with the water table surface, a map of the thickness of the Water Table Aquifer was generated (Figure 3-12). This map shows that the aquifer thickens in a southeasterly direction. In three of four quadrants of the AIP (southwest, northwest, northeast), the thickness of the aquifer is 15 ft or less. This establishes that for the majority of the site, the monitoring well network, equipped with screen lengths of 10 ft, is adequate. In the southeast quadrant of the site, the Water Table Aquifer thickens to a maximum of

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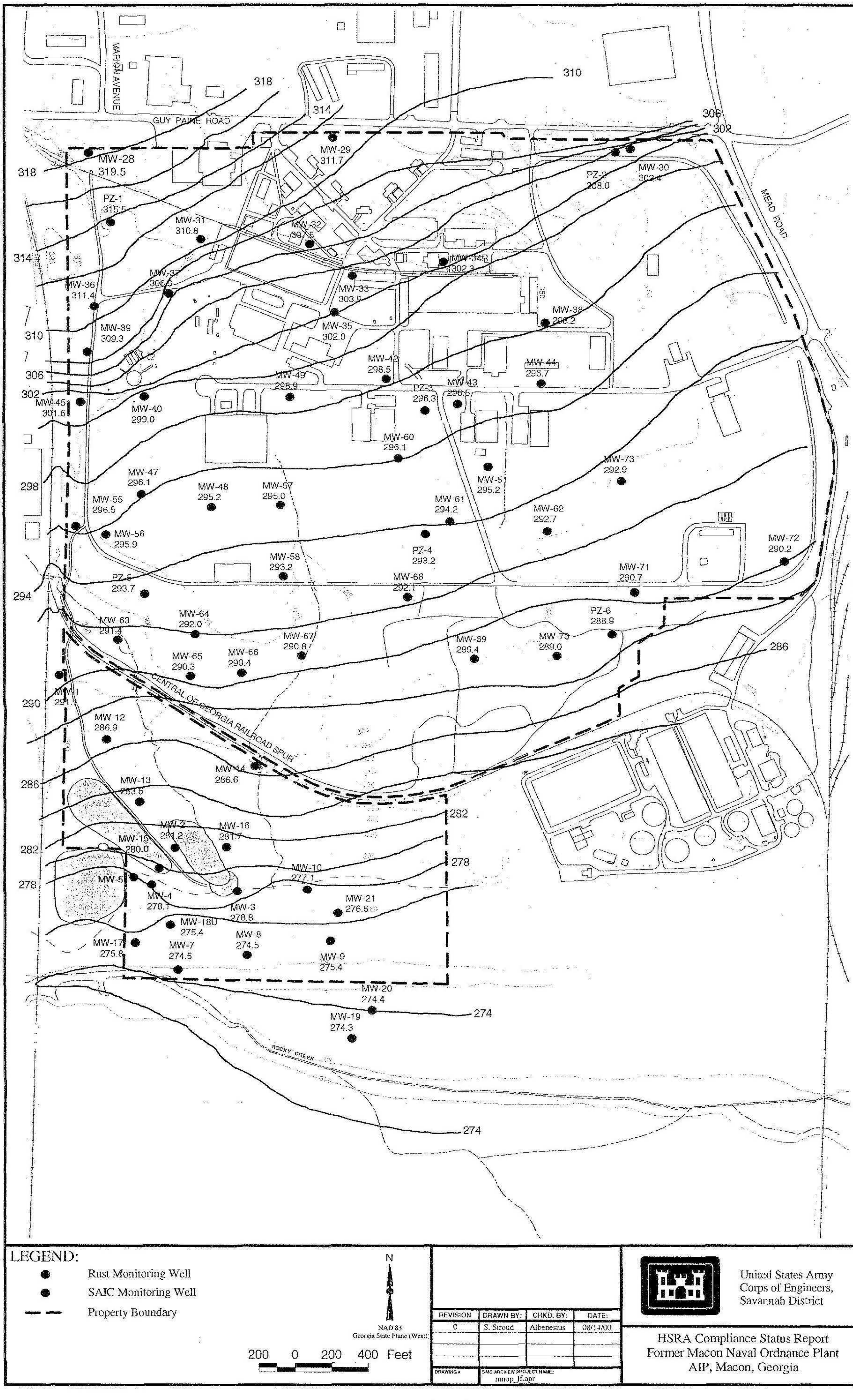

Figure 3-11. Water Table Surface (12/03/98)

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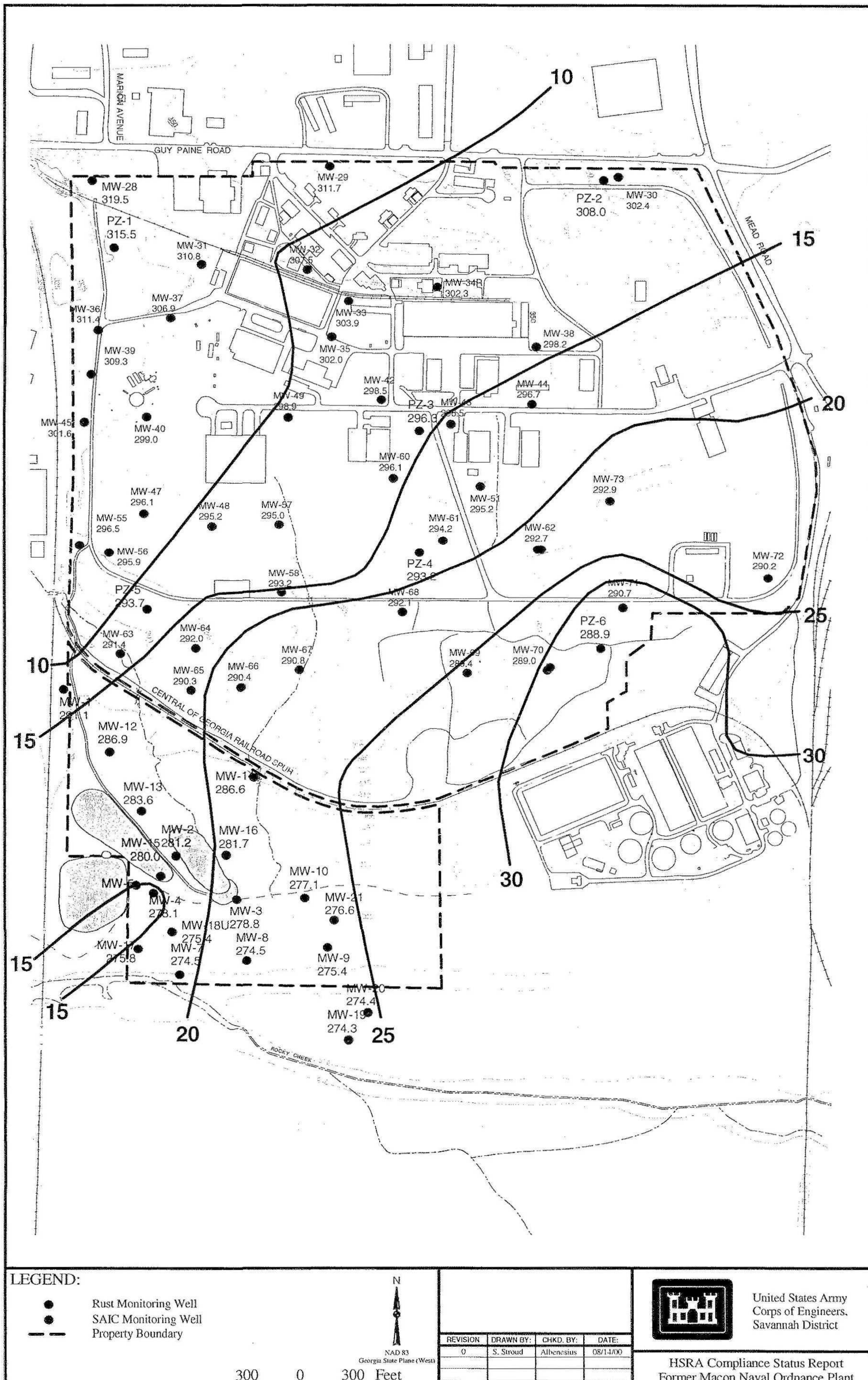

Figure 3-12. Water Table Aquifer Thickness

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approximately 30 ft. In this quadrant, wells screened in the top 10 ft will not monitor all or most of the aquifer thickness.

3.1.3.1 Hydraulic Conductivity

As part of the Project Action Plan study (Rust 1994), Rust reported an average hydraulic conductivity of 3.02 ft per day (ft/day) (1.1×10^{-3} centimeters per second (cm/sec)) for the Water Table Aquifer. SAIC conducted slug tests on twenty new Water Table Aquifer wells at the AIP site. Rising head and falling head tests were conducted and the data were analyzed using the Bouwer and Rice solution (1976), modified by Bouwer (1989). The tested wells are distributed across the AIP so the data set provides a valid representation of the entire site. For 16 of the 20 wells, a significant portion (>0.5 ft) of the well screen extends up into the unsaturated zone. For these wells, the falling head test results were determined to be invalid due to the condition of groundwater flowing into the unsaturated gravel pack during the falling head process.

For four of the wells, the screens were either completely submerged below the water table surface, or nearly so. For these wells, both rising head and falling head test data were considered valid and in those four cases, the agreement between rising head and falling head test results was very good.

Hydraulic conductivity (K) estimates for the 20 wells range from 0.05 to 127.0 ft/day with an average result of 19.69 ft/day. A bar graph of the slug test results (Figure 3-13) reveals that the data set is skewed by the highest result. Removing the lowest and highest data points results in a more uniform distribution with a range of 0.54 to 61.2 ft/day and an average of 14.8 ft/day.

Hydraulic conductivity estimates in ft/day were posted on a map of the AIP (Figure 3-14). The distribution of K provides some insight into the observed patterns of groundwater contamination at the AIP. The area represented by K>10 ft/day excludes the westernmost portion of the site and the northeast quadrant. This is consistent with the mapping of groundwater contamination which shows that TCE plumes are not discernable in the northeast quadrant or across the western property boundary. Table 3-2 provides estimates of hydraulic conductivity for all of the tested wells. Appendix H contains the slug test plots.

3.1.3.2 Vertical Head Relationships

By comparing structure contours of the top of the MNOP Confining Unit, with the water table surface, a map of the thickness of the Water Table Aquifer was generated (Figure 3-12). This map shows that the aquifer thickens in a southeasterly direction. In three of four quadrants of the AIP

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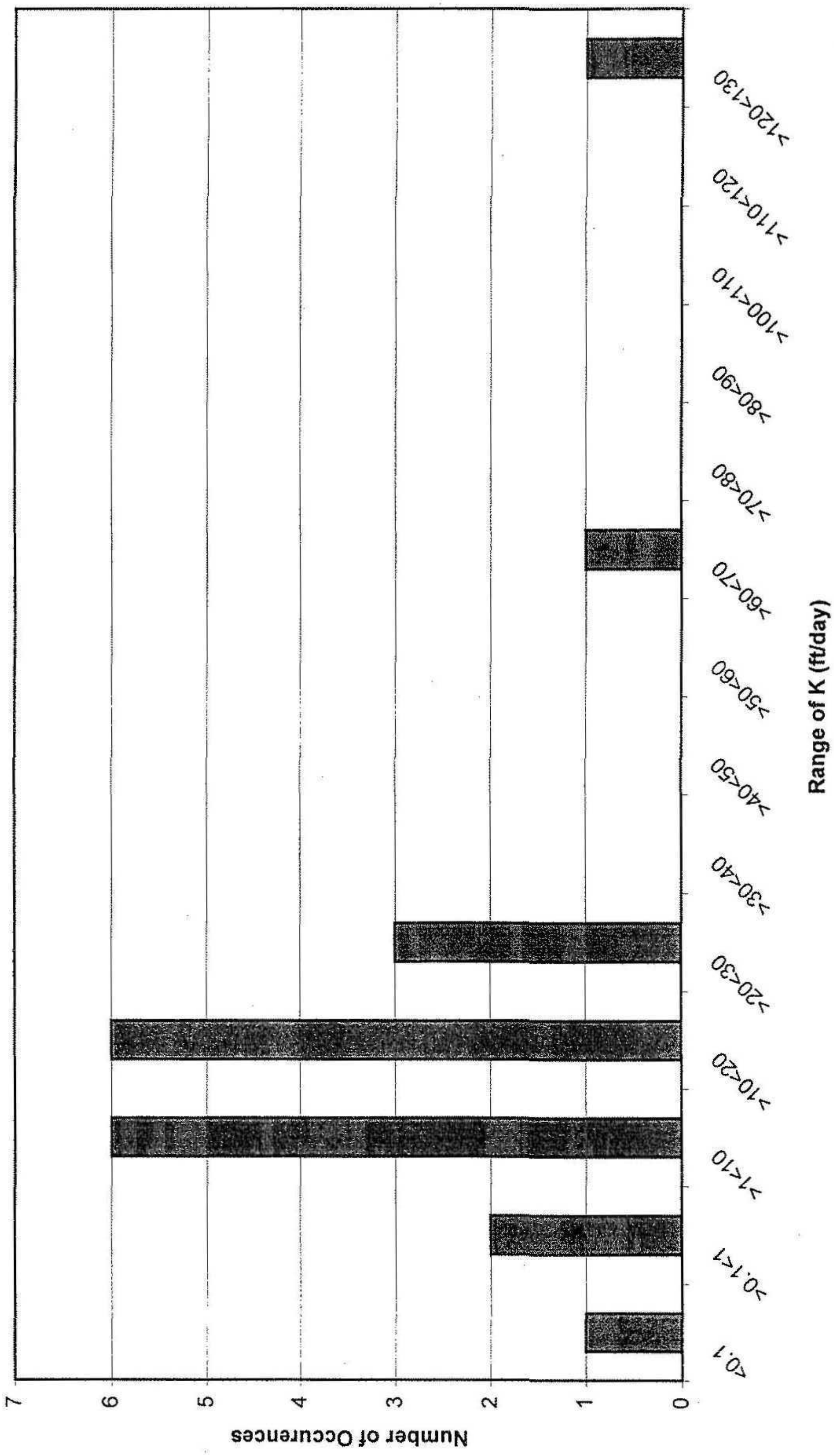

Figure 3-13. Distribution of AIP Slug Test Results

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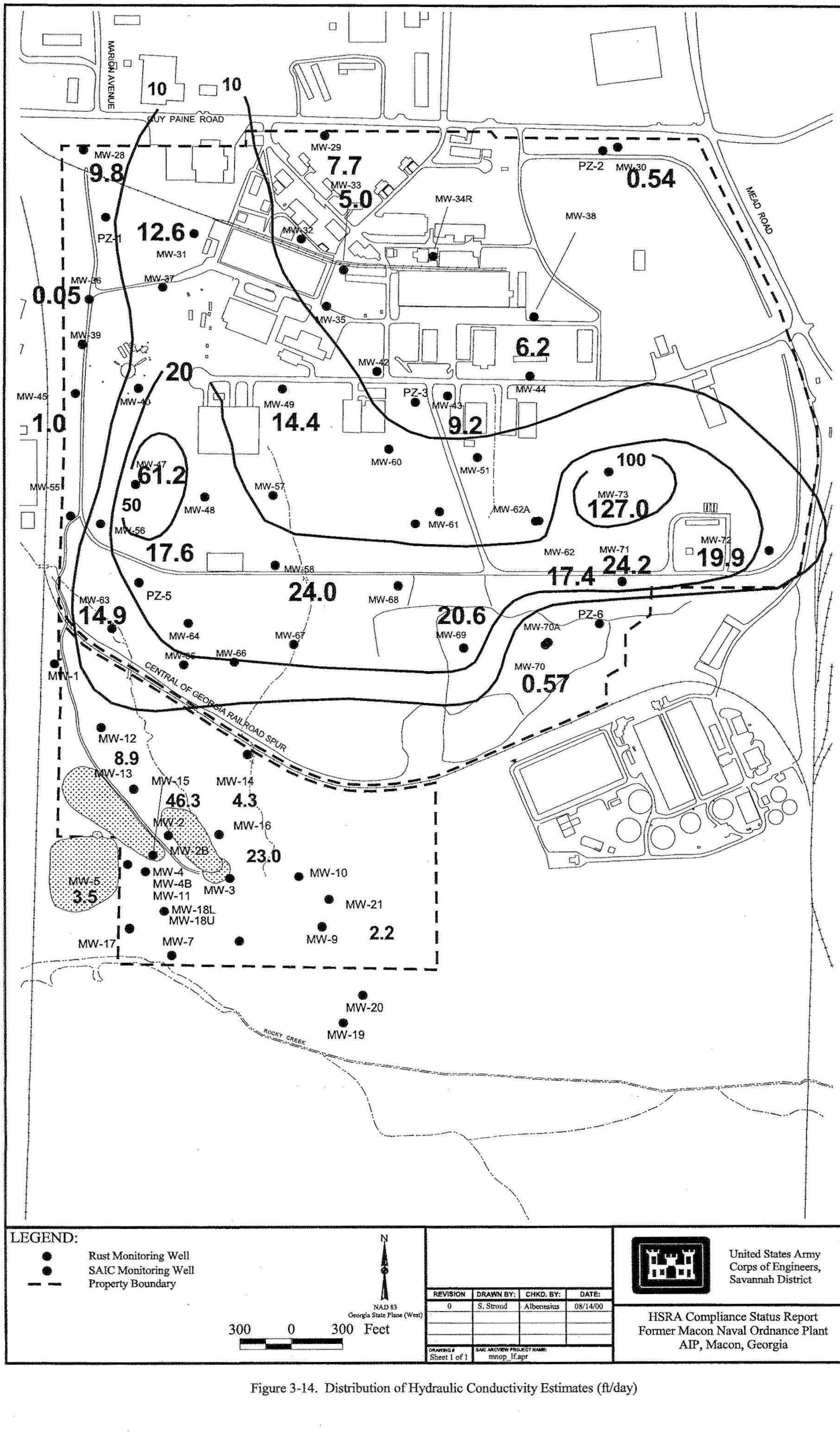

Figure 3-14. Distribution of Hydraulic Conductivity Estimates (ft/day)

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Table 3-2. AIP Monitoring Wells
Hydraulic Conductivity Estimates

Well No.	Ground Surface Elevation (ft msl)	Top of Screen Depth (ft bls)	Top of Screen Elevation (ft msl)	Groundwater Elevation (ft msl)	Rising Head		Falling Head	
					cm/sec	ft/day	cm/sec	ft/day
MW-28	330.3	8.5	321.8	319.5	3.44E-03	9.76	NA	NA
MW-29	369.57	55.5	314.1	311.7	2.72E-03	7.70	NA	NA
MW-30	337.65	33.0	304.7	302.4	1.91E-04	0.54	NA	NA
MW-31	336.89	25.0	311.9	310.8	4.45E-03	12.60	NA	NA
MW-33	347.28	41.0	306.3	303.9	1.76E-03	5.00	NA	NA
MW-36	318.9	7.5	311.4	311.4	1.76E-05	0.05	5.29E-05	0.15
MW-38	353.34	52.5	300.8	298.2	2.20E-03	6.24	NA	NA
MW-43	345.79	46.0	299.8	296.9	3.25E-03	9.21	NA	NA
MW-45	318.09	18.1	300.0	301.6	3.53E-04	1.00	4.23E-04	1.20
MW-47	338.24	39.0	299.2	296.1	2.16E-02	61.20	NA	NA
MW-49	334.92	36.0	298.9	298.9	5.08E-03	14.40	4.48E-03	12.70
MW-56	327.3	28.5	298.8	295.9	6.21E-03	17.60	NA	NA
MW-58	328.8	32.0	296.8	293.2	8.47E-03	24.00	NA	NA
MW-62	327.84	33.0	294.8	292.7	6.14E-03	17.40	NA	NA
MW-63	296.47	3.0	293.5	291.4	5.26E-03	14.90	NA	NA
MW-69	332.9	39.0	293.9	289.37	7.27E-03	20.60	NA	NA
MW-70	318.36	28.6	289.8	290.0	2.01E-04	0.57	7.06E-05	0.20
MW-71	306.31	13.0	293.3	290.7	8.54E-03	24.20	NA	NA
MW-72	308.88	16.3	292.6	290.2	7.02E-03	19.90	NA	NA
MW-73	321.65	28.4	293.3	292.9	4.48E-02	127.00	NA	NA
Min					**1.76E-05**	**0.05**	**5.29E-05**	**0.15**
Max					**4.48E-02**	**127.00**	**4.48E-03**	**12.70**
Mean					**6.95E-03**	**19.69**	**1.26E-03**	**3.56**

(southwest, northwest, northeast), the thickness of the aquifer is 15 ft or less. In the southeast quadrant of the site, the Water Table Aquifer thickens to a maximum of approximately 30 ft. Two new wells were installed in the southeast quadrant, in 2000, paired with existing wells. The new wells (MW-70A and –62A) are screened at the base of the Water Table Aquifer. The existing wells (MW-70 and MW-62) are screened at the top of the aquifer. Water levels in these wells indicate that there is a negligible vertical gradient within the aquifer in the southeast quadrant of the AIP.

There are no monitoring wells screened within the Tuscaloosa Aquifer at the AIP so a comparison of heads between the Water Table Aquifer and the Tuscaloosa Aquifer is not possible. However, well clusters at the MNOP Landfill include wells screened in both aquifers and at these locations there is a significant drop in head across the MNOP Confining Unit.

3.1.3.3 Geotechnical Test Results

Three types of geotechnical tests were conducted on AIP geologic samples. For each well boring, if a low permeability layer was encountered, a sample was collected for analysis of moisture content, liquid limit, and plasticity index. Within the same boring, a coarse grained sample, preferably within the targeted screen zone, was collected for grain size analysis. If no low permeability layer was encountered in the boring, then samples from four separate intervals of coarse grained material were collected for grain size analysis. During the coring phase of the investigation, a clay sample was removed from AIP corehole CH-6 and sent for analysis of vertical permeability, dry density, and moisture content. This corehole was located in the southeast quadrant of the site. The sample was collected from a depth of 90 ft bls. Sample test results are included in Table 3-3.

In 20 of the 39 AIP well borings, a fine grained, or low permeability, layer was encountered and analyzed for moisture content, liquid limit, and plasticity index. Moisture content in these samples ranged from 8.3 to 31.8 percent with a mean of 17.7 and a median value of 16.3 percent. Liquid limit ranged from 30 to 67 with a mean value of 45, and a median value of 41. Plasticity index ranged from 9 to 40 with a mean value of 24 and a median value of 20. The characteristics of these fine grained sediments are very similar to those observed in samples of fine grained sediments from Landfill borings.

For the coarse grained sediments, percent sand ranged from 36 to 96 with a mean value of 80 and a median value of 85. Percent fines ranged from 0 to 64 with a mean of 19 and median of 14. Gravel content ranged from 0 to 15 percent with a mean of 1.4 and a median value of 0.

Table 3-3. Geotechnical Sampling Results

Sample ID	Depth (ft)	Dry Density (pcf)	Moisture (%)	Permeability (cm/s)	Particle Size			Atterberg Limits	
					Gravel (%)	Sand (%)	Fines (%)	LL	PI
CH-06	90	116.9	14.7	2.55E-08					
MW-28-01	5-7				0	84	16		
MW-28-02	10-12				0	88	12		
MW-28-03	14-16				1	79	20		
MW-28-04	18-20				0	89	11		
MW-29-01	15-17				2	67	31		
MW-29-02	30-32				0	90	10		
MW-29-03	50-52				0	76	24		
MW-29-04	64-66				2	88	10		
MW-30-01	15-17		14.2					30	13
MW-30-02	35-37				1	86	13		
MW-31-01	0-2		10.3					37	20
MW-31-02	12-14				12	67	21		
MW-32-01	25-27				1	85	14		
MW-32-02	30-32				0	88	12		
MW-32-03	40-42				0	90	10		
MW-32-04	45-47				1	88	11		
MW-33-01	40-42				1	81	18		
MW-33-02	44-46				1	87	12		
MW-33-03	46-48				3	86	11		
MW-33-04	48-50				15	76	9		
MW-34-01	20-22				0	95	5		
MW-34-02	34-36		13.5					34	16
MW-35-01	10-12				0	44	56		
MW-35-02	15-17				7	44	49		
MW-35-03	40-42				0	87	13		
MW-35-04	49-51				1	87	12		
MW-36-01	0-2				0	59	41		
MW-36-02	5-7				0	61	39		
MW-37-01	0-2		13.1					41	25
MW-37-02	29-31				1	86	13		
MW-38-01	30-32		15.3					32	9
MW-38-02	40-42		13.6					43	22
MW-38-03	50-52				4	83	13		
MW-38-04	57-59				4	96	0		
MW-39-01	5-7		31.7					32	13
MW-39-02	15-17				3	87	10		
MW-40-01	5-7				1	74	25		
MW-40-02	15-17				0	36	64		
MW-40-03	20-22				0	78	22		
MW-40-04	34-36				0	93	7		
MW-42-01	15-17				0	70	30		
MW-42-02	30-32				0	86	14		
MW-42-03	45-47				2	87	11		
MW-42-04	55-57				2	90	8		
MW-43-01	25-27				0	78	22		
MW-43-02	35-37		17.6						
MW-44-01	20-22				0	81	19		
MW-44-02	30-32				0	80	20		
MW-44-03	45-47				0	88	12		
MW-44-04	57-59				1	91	8		
MW-45-01	5-7				0	76	24		
MW-45-02	10-12				0	85	15		
MW-45-03	15-17				0	85	15		
MW-45-04	22-24				1	87	12		
MW-47-01	25-27				0	82	18		

Table 3-3. Geotechnical Sampling Results (Continued)

Sample ID	Depth (ft)	Dry Density (pcf)	Moisture (%)	Permeability (cm/s)	Particle Size			Atterberg Limits	
					Gravel (%)	Sand (%)	Fines (%)	LL	PI
MW-47-02	32-34		26.5					55	29
MW-48-01	10-12				2	82	16		
MW-48-02	20-22				0	86	14		
MW-48-03	35-37				0	81	19		
MW-48-04	45-47				2	84	14		
MW-49-01	5-7		16.2					53	31
MW-49-02	41-42.5				0	93	7		
MW-51-01	15-17				9	55	36		
MW-51-02	25-27				1	77	22		
MW-51-03	35-37				0	79	21		
MW-51-04	52-54				0	90	10		
MW-55-01	10-12				0	77	23		
MW-55-02	27-29		31.8					43	19
MW-56-01	15-17		12					31	14
MW-56-02	25-27				0	85	15		
MW-57-01	10-12				0	55	45		
MW-57-02	25-27				0	78	22		
MW-57-03	30-32				0	61	39		
MW-57-04	43-45				1	94	5		
MW-58-01	34-36		16.3					40	19
MW-58-02	38-40				0	89	11		
MW-60-01	10-12		18.4					57	38
MW-60-02	50-52				1	93	6		
MW-61-01	25-27				0	72	28		
MW-61-02	39-41				0	91	9		
MW-61-03	41-43				0	92	8		
MW-61-04	43-45				1	87	12		
MW-62-01	15-17		18.9					57	35
MW-62-02	42-44				1	93	6		
MW-63-01	5-7				0	62	38		
MW-63-02	11-13		18.9					36	20
MW-64-01	20-22				0	57	43		
MW-64-02	32-34				0	81	19		
MW-64-03	34-36				0	90	10		
MW-64-04	36-38				1	89	10		
MW-65-01	5-7		15.4					67	40
MW-65-02	31-33				1	88	11		
MW-66-01	5-7				0	59	41		
MW-66-02	10-12				0	77	23		
MW-66-03	25-27				0	89	11		
MW-66-04	36-38				3	82	15		
MW-67-01	5-7		19.1					62	36
MW-67-02	24-26				0	93	7		
MW-68-01	47-49		18.4					38	20
MW-68-02	53-55				0	90	10		
MW-69-01	20-22								
MW-69-02	46-48								
MW-70-01	15-17		19.7					62	39
MW-70-02	36-38				0	89	11		
MW-71-01	5-7		13.8						
MW-71-02	19-21				11	63	26		
MW-72-01	0-2		23.7					56	33
MW-72-02	15-17				10	73	17		
MW-73-01	25-27		8.3					36	18
MW-73-02	36-38				0	93	7		
min			8.3		0	36	0	30	9
max			31.8		15	96	64	67	40
average			17.68		1.39	80.08	18.53	44.86	24.24
median			16.3		0	85	14	41	20

4.0 NATURE AND EXTENT OF CONTAMINATION

During the 1996, 1998 and 2000 investigations at the AIP, soil, sediment, surface water, and groundwater were sampled and analyzed for a variety of constituents. Analytical data were validated in accordance with the QAPP of the approved Work Plan (SAIC 2000). While 1996 data is formally documented in Rust (1997), the 1998 and 2000 data are formally documented herein. A QCSR for the 1998 and 2000 data is included as Appendix M. Raw analytical data (1998 and 2000) in tabular form are included in Appendix N. Data summary tables are presented in Appendix O.

4.1 Hazardous Site Response Act Screening Process

The initial step of the nature and extent evaluation is a screening of all the data using the HSRA guidance (GA Rule 391-3-19). The HSRA process identifies various screening concentrations for soil and groundwater as Type I (default residential), Type II (site-specific residential), Type III (default industrial) and Type IV (site-specific industrial). By directly comparing AIP media concentrations against the various screening levels, the potentially significant chemicals are identified. In addition, the screening of individual sample results creates a spatial definition of potentially significant areas of contamination across the AIP. The HSRA screening and data interpretation for the AIP is presented in subsequent sections. The derivation of groundwater and soil HSRA standards is provided in Appendix I.

4.1.1 Potential Receptors at Allied Industrial Park

Prior to implementing the HSRA screen, a qualitative review of the potential receptors and likely environmental exposure was completed. This information helps to logically interpret the HSRA screening results. For example, the Type III and Type IV HSRA standards are the most appropriate standards for screening sites where the land use is industrial and residential land use is not anticipated due to zoning or other factors.

The most likely human receptors at the AIP are industrial workers who maintain jobs on the AIP. If these workers have routine jobs in outside settings, they could be exposed to soil via incidental ingestion, particulate/volatile inhalation, or dermal contact. Human exposure to the water table groundwater is unlikely. Production wells in use at the site are all deeper wells that should not extract groundwater from the Water Table Aquifer. The potential for contaminant migration to the Tuscaloosa aquifer is discussed in Section 5.0 of this report.

Ecological receptors could include a wide variety of small mammals, birds, and reptiles. Ecological receptors are likely limited in the industrial portions of the AIP or in maintained landscaped areas. Where buildings do not exist and oldfield habitat is present, there would be a higher number and diversity of potential ecological receptors. Ecological receptors would potentially be exposed to soil. Ecological exposure to groundwater is not considered a viable exposure route at the AIP.

4.1.2 Soil Data Screening

The field activities and resulting soil data from the AIP were described in Section 2.0. The data are summarized in Appendix O. Each detected analyte was screened versus the appropriate HSRA standards. The HSRA soil standards are derived in Appendix I and may consist of pre-defined screening levels, background concentrations, risk-based concentrations, or the analytical detection limit. Background for soil was taken as the average detected concentration from sample locations ISL-18, ISL-19, ISL-61, and ISL-62 (Figure 2-2). These locations are topographically upgradient of the industrial area of the AIP. Table 4-1 summarizes the soil background.

The results of the HSRA soil screen are discussed in Section 4.2.

4.1.3 Groundwater

The available AIP groundwater data were described in Section 2.0. The data are summarized in Appendix O and the raw data are provided in Appendix N. Each detected analyte was screened versus the appropriate HSRA standards. The HSRA groundwater standards are derived in Appendix I and may consist of pre-defined screening levels, background concentrations, risk-based concentrations, or the analytical detection limit.

The 1996 groundwater were all sampled with DPT technology and had markedly higher metals concentrations than the 1998 and 2000 groundwater samples. Due to this difference, the groundwater data sets were screened in the HSRA process as separate data sets. The background for the 1996 groundwater was taken as sample locations IGW-18, IGW-19, IGW-61, and IGW-62 (Figure 2-4). The 1996 background data are summarized on Table 4-2.

The 1998/2000 background was selected as locations MW-28, MW-29, MW-30, PZ-1, and PZ-2 (Figure 2.5). The 1998/2000 data are summarized in Table 4-3.

The results of the HSRA groundwater screen are discussed in Section 4.3.

Table 4-1. Derivation of Soil Background
Allied Industrial Park
Former Macon Naval Ordnance Plant

Station	Sample Date	Parameter	Result	Units	Qualifier	Average Detect
ISL-18 (1'-2')	1996	Beryllium	0.29	mg/kg	J	
ISL-18 (55'-56')	1996	Beryllium	0.028	mg/kg	J	
ISL-19 (1'-2')	1996	Beryllium	0.34	mg/kg	J	
ISL-19 (70'-71')	1996	Beryllium	0.024	mg/kg	J	
ISL-61 (1'-2')	1996	Beryllium	0.14	mg/kg	J	
ISL-62 (1'-2')	1996	Beryllium	0.16	mg/kg	J	
ISL-62 (15'-16')	1996	Beryllium	0.036	mg/kg	J	0.145429
ISL-19 (1'-2')	1996	Cadmium	0.28	mg/kg	J	
ISL-61 (1'-2')	1996	Cadmium	0.36	mg/kg	J	
ISL-62 (1'-2')	1996	Cadmium	0.21	mg/kg	J	0.283333
ISL-18 (1'-2')	1996	Chromium	18.3	mg/kg		
ISL-18 (55'-56')	1996	Chromium	5.68	mg/kg		
ISL-19 (1'-2')	1996	Chromium	24.3	mg/kg		
ISL-19 (70'-71')	1996	Chromium	1.56	mg/kg		
ISL-61 (1'-2')	1996	Chromium	9.71	mg/kg		
ISL-62 (1'-2')	1996	Chromium	10.7	mg/kg		
ISL-62 (15'-16')	1996	Chromium	8.42	mg/kg		11.23857
ISL-18 (1'-2')	1996	Copper	6.2	mg/kg		
ISL-18 (55'-56')	1996	Copper	1.37	mg/kg		
ISL-19 (1'-2')	1996	Copper	8.67	mg/kg		
ISL-61 (1'-2')	1996	Copper	4.93	mg/kg		
ISL-62 (1'-2')	1996	Copper	3.69	mg/kg		
ISL-62 (15'-16')	1996	Copper	1.59	mg/kg		4.408333
ISL-62 (1'-2')	1996	Hexachlorobutadiene	0.0047	mg/kg	J	0.0047
ISL-18 (1'-2')	1996	Lead	9.4	mg/kg		
ISL-18 (55'-56')	1996	Lead	2.44	mg/kg		
ISL-19 (1'-2')	1996	Lead	10.3	mg/kg		
ISL-19 (70'-71')	1996	Lead	4.89	mg/kg		
ISL-61 (1'-2')	1996	Lead	15.2	mg/kg		
ISL-62 (1'-2')	1996	Lead	5.81	mg/kg		
ISL-62 (15'-16')	1996	Lead	3.07	mg/kg		7.301429
ISL-18 (1'-2')	1996	Mercury	0.13	mg/kg		
ISL-19 (1'-2')	1996	Mercury	0.14	mg/kg		
ISL-61 (1'-2')	1996	Mercury	0.044	mg/kg	J	0.104667
ISL-18 (1'-2')	1996	Nickel	5.23	mg/kg		
ISL-18 (55'-56')	1996	Nickel	4.1	mg/kg		
ISL-19 (1'-2')	1996	Nickel	7.12	mg/kg		
ISL-61 (1'-2')	1996	Nickel	3	mg/kg		
ISL-62 (1'-2')	1996	Nickel	2.28	mg/kg	J	
ISL-62 (15'-16')	1996	Nickel	0.68	mg/kg	J	3.735
ISL-19 (70'-71')	1996	Selenium	0.678	mg/kg		
ISL-61 (1'-2')	1996	Selenium	0.48	mg/kg	J	0.579
ISL-61 (1'-2')	1996	Thallium	0.41	mg/kg	J	0.41
ISL-61 (1'-2')	1996	Trichloroethene	0.0062	mg/kg		0.0062
ISL-18 (1'-2')	1996	Zinc	15.2	mg/kg		
ISL-18 (55'-56')	1996	Zinc	3.04	mg/kg		
ISL-19 (1'-2')	1996	Zinc	20.7	mg/kg		
ISL-19 (70'-71')	1996	Zinc	1.2	mg/kg	J	
ISL-61 (1'-2')	1996	Zinc	16.2	mg/kg		
ISL-62 (1'-2')	1996	Zinc	8.34	mg/kg		10.78

Background = Rust soil samples ISL-18, ISL-19, ISL-61, and ISL-62.

Table 4-2. Derivation of Groundwater Background (1996 Sampling Event)
Allied Industrial Park
Former Macon Naval Ordnance Plant

Station	Sample Date	Parameter	Result	Units	Qualifier	Average Detect
IGW-18	1996	Beryllium	0.21	UG/L	J	
IGW-19	1996	Beryllium	0.24	UG/L	J	
IGW-62	1996	Beryllium	0.31	UG/L	J	
IGW-61	1996	Beryllium	4.83	UG/L		1.3975
IGW-19	1996	Cadmium	2.9	UG/L	J	
IGW-61	1996	Cadmium	12.6	UG/L		7.75
IGW-18	1996	Chromium	204	UG/L		
IGW-62	1996	Chromium	577	UG/L		
IGW-19	1996	Chromium	706	UG/L		
IGW-61	1996	Chromium	1000	UG/L		621.75
IGW-62	1996	Copper	252	UG/L		
IGW-19	1996	Copper	320	UG/L		
IGW-61	1996	Copper	382	UG/L		
IGW-18	1996	Copper	396	UG/L		337.50
IGW-18	1996	Lead	13	UG/L		
IGW-62	1996	Lead	15	UG/L		
IGW-19	1996	Lead	41	UG/L		
IGW-61	1996	Lead	220	UG/L		72.25
IGW-18	1996	Mercury	0.3	UG/L		
IGW-62	1996	Mercury	0.4	UG/L		
IGW-19	1996	Mercury	0.5	UG/L		0.4
IGW-18	1996	Nickel	84.9	UG/L		
IGW-19	1996	Nickel	208	UG/L		
IGW-61	1996	Nickel	229	UG/L		
IGW-62	1996	Nickel	233	UG/L		188.73
IGW-62	1996	Selenium	2.8	UG/L	J	
IGW-61	1996	Selenium	4.6	UG/L	J	3.70
IGW-62	1996	Tetrachloroethene	1.4	UG/L	J	1.4
IGW-62	1996	Thallium	2.9	UG/L	J	2.9
IGW-62	1996	Zinc	205	UG/L		
IGW-61	1996	Zinc	340	UG/L		272.50

Background = DPT samples IGW-18, IGW-19, IGW-61, IGW-62

Table 4-3. Derivation of Groundwater Background (1998 Sampling Event)
Allied Industrial Park
Former Macon Naval Ordnance Plant

Station	Sample Date	Parameter	Result	Units	Qualifier	Average Detect
MW29-GW1	10/27/1998	Chloroform	0.60	ug/L	J	
MW30-GW1	10/27/1998	Chloroform	0.64	ug/L	J	
PZ-2	10/27/1998	Chloroform	0.80	ug/L	J	0.68
MW30-GW1	10/27/1998	Chromium	11.70	ug/L		
MW29-GW1	10/27/1998	Chromium	28.30	ug/L		20.00
MW30-GW1	10/27/1998	Copper	4.10	ug/L		
MW29-GW1	10/27/1998	Copper	4.50	ug/L		4.30
MW29-GW1	10/27/1998	Lead	3.30	ug/L		
MW28-GW1	10/27/1998	Lead	5.20	ug/L		
MW30-GW1	10/27/1998	Lead	7.90	ug/L		5.47
MW28-GW1	10/27/1998	Nickel	1.70	ug/L		
MW29-GW1	10/27/1998	Nickel	26.60	ug/L		
MW30-GW1	10/27/1998	Nickel	30.60	ug/L		19.63
MW30-GW1	10/27/1998	Selenium	2.40	ug/L		2.40
MW29-GW1	10/27/1998	Tetrachloroethylene	0.56	ug/L	J	
MW30-GW1	10/27/1998	Tetrachloroethylene	2.00	ug/L	J	
PZ-2	10/27/1998	Tetrachloroethylene	2.40	ug/L	J	1.653333
MW29-GW1	10/27/1998	Zinc	19.30	ug/L		
MW30-GW1	10/27/1998	Zinc	75.20	ug/L		
MW28-GW1	10/27/1998	Zinc	110.00	ug/L		68.17

Background Wells = MW-28, MW-29, MW-30, PZ-1, and PZ-2

4.1.4 Sediment

Sediment data were screened using the HSRA soil standards. Sediment data are summarized in Appendix O. Raw sediment data are presented in Appendix N. The results of the HSRA screen for sediment samples is provided in Section 4.4.

4.1.5 Surface Water

A limited number of AIP surface water data were collected and are summarized in Appendix O. The raw surface water data are presented in Appendix N.

The HSRA rule does not specifically develop standards for surface water. However, the Georgia Water Quality Standards (GA code Chapter 391-3-6) were used to screen all of the detected analytes. The results of the surface water screening are discussed in Section 4.5.

4.2 Soil Screening Results

Both surface and subsurface soils were collected during 1996, 1998, and 2000. Sampling activities are detailed in Section 2.0. HSRA standards for soil are derived in Appendix I.

The screening of all analytical detections for soil is provided in Appendix J (Table J-1). Table 4-4 provides the specific results that exceeded any HSRA standard. As seen on Table 4-4 there are very few analytes and locations that exceeded Type I HSRA standards. Only one compound (TCE) exceeded the Type 2 and Type 3 HSRA standards. This constituent only exceeded standards at location ISL-4 (depth 1-3 ft) and sample location ISL-117-02 (4-6 ft). Location ISL-117 is in the vicinity of the highest plume concentrations of TCE (see Figure 2-3). All sample locations, however, complied with Type 4 HSRA soil standards.

4.3 Groundwater Screening Results

Groundwater was sampled during 1996, 1998, and 2000. Sampling activities are detailed in Section 2.0. HSRA standards for groundwater are derived in Appendix I.

The groundwater data sets were evaluated separately to facilitate the interpretation of inorganic results. The 1996 data set were collected via DPT technology and had markedly higher inorganic results than the 1998/2000 sampling events. Most the groundwater samples represent the upper portions of the Water Table Aquifer. Production wells AWL-6 and GHW-1 represent the underlying

Table 4-4. Sample Locations That Exceed HSRA Soil Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sample ID	Date	Parameter	Qualifier	AIP Result	Units	Type 1 Standard	Status	Type 2 Standard	Status	Type 3 Standard	Status	Type 4 Standard	Status
ISL-117-02	06/05/1998	1,2-Dichloroethylene		0.853	mg/kg	0.53	AIP > Type 1	2.66	<	--	--	--	--
ISL-8 (9'-11')	1996	Antimony	J	4.2	mg/kg	4	AIP > Type 1	5.66	<	--	--	--	--
ISL-7 (0'-2')	1996	Cadmium		2.27	mg/kg	2	AIP > Type 1	11.76	<	--	--	--	--
ISL-8 (0'-2')	1996	Cadmium		2.32	mg/kg	2	AIP > Type 1	11.76	<	--	--	--	--
ISL-44 (1'-2')	1996	Chromium		181	mg/kg	100	AIP > Type 1	117321.43	<	--	--	--	--
ISL-4 (1'-3')	1996	Tetrachloroethene	J	0.8	mg/kg	0.5	AIP > Type 1	0.964	<	--	--	--	--
ISL-4 (1'-3')	1996	Trichloroethene	J	1.2	mg/kg	0.5	AIP > Type 1	1.15	AIP > Type 2	0.5	AIP > Type 3	2.22	<
ISL-8 (9'-11')	1996	Trichloroethene	J	0.55	mg/kg	0.5	AIP > Type 1	1.15	<	--	--	--	--
ISL-117-02	06/05/1998	Trichloroethylene		1.7	mg/kg	0.5	AIP > Type 1	1.15	AIP > Type 2	0.5	AIP > Type 3	2.22	<
ISL-11 (0'-2')	1996	Zinc		218	mg/kg	100	AIP > Type 1	5837.91	<	--	--	--	--
ISL-54 (0.5'-2')	1996	Zinc		326	mg/kg	100	AIP > Type 1	5837.91	<	--	--	--	--
ISL-55 (1'-2')	1996	Zinc		538	mg/kg	100	AIP > Type 1	5837.91	<	--	--	--	--

"<" = AIP concentration is less than the HSRA soil standard.
"--" = No comparsion was initiated because Type 1, Type 2, or Type 3 standard was met.

Tuscaloosa Aquifer. Also, 1998 CPT sample IGW-67-02 was taken from a depth of 98 feet and represents a sandy interval within the MNOP Confining Unit. The monitoring wells installed during 2000 (MW-62A and MW-70A) represent the lower portion of the Water Table Aquifer in the southeast quadrant of the AIP.

4.3.1 1996 Groundwater Screening

The 1996 data set consisted of Water Table Aquifer samples collected via DPT methods. The complete 1996 groundwater data set is screened versus HSRA standards in Appendix J (Table J-2). Table 4-5 provides the specific results that exceeded any HSRA standard. As seen on Table 4-5, there were numerous inorganic and organic constituents that exceeded Type 1 and 3 RRS. However, when screened versus the Type 2 and 4 groundwater standards, there are significantly fewer chemicals that exceeded.

Since the AIP will likely remain an industrial area, this nature and extent interpretation will focus on the constituents and areas that exceeded the Type 4 groundwater standard (site-specific industrial). The inorganics that exceeded the Type 4 groundwater standards include arsenic, lead, and mercury. These stations are identified on Table 4-5 and are graphically shown on Figure 4-1. As shown in the figure, the distribution of stations is random and does not indicate a clear plume of inorganic contamination. Rather these 1996 detections of inorganics are more likely a result of the DPT methods used in the sampling.

The organic constituents in the 1996 data set that exceed the Type 4 groundwater standards include 1,1-DCE (IGW-9), a,a-dimethylphenethylamine(IGW-15), cis-1,2-DCE (IGW-9), TCE (13 stations) and vinyl chloride (IGW-9). The TCE contamination at the site is clearly a concern with the maximum 1996 detection of TCE (62,000 ug/L at IGW-9) three orders of magnitude higher than the Type 4 standard (40 ug/L). A plume map of the TCE concentrations across the AIP was developed using all data (1996, 1998, and 2000) and is presented on Figure 4-2. The Type 1, 2, 3, and 4 groundwater standards appear as different color lines Figure 4-3. Even with just single stations exceeding the Type 4 standard, 1,1-DCE, cis-1,2-DCE, and vinyl chloride are a concern at the AIP because they are degradation products of TCE and the reported detections coincide with the maximum TCE results.

4.3.2 1998 and 2000 Groundwater Screening

The 1998 and 2000 data set consisted of CPT groundwater samples as well as monitoring well samples. The complete 1998/2000 groundwater data set is screened versus HSRA standards in Appendix J (Table J-3). Table 4-6 provides the specific results that exceeded any HSRA standard.

Table 4-5. 1996 Sample Locations That Exceed HSRA Groundwater Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sample ID	Date	Parameter	AIP Result	Qual	Units	Type 1 & 3 Standard	Status	Type 2 Standard	Status	Type 4 Standard	Status
IGW-9	1996	1,1-dichloroethene	7.8	J	ug/L	7	AIP > Type 1	1.00	AIP > Type 2	1.22	AIP > Type 4
IGW-9	1996	1,2,4-trimethylbenzene	2.3	J	ug/L	1	AIP > Type 1	3.53	<	--	--
IGW-15	1996	2,6-dinitrotoluene	12		ug/L	10	AIP > Type 1	15.64	<	--	--
IGW-15	1996	a,a-dimethylphenethylamine	14		ug/L	10	AIP > Type 1	10.00	AIP > Type 2	10.00	AIP > Type 4
IGW-25	1996	Antimony	25	J	ug/L	6	AIP > Type 1	6.26	AIP > Type 2	40.88	<
IGW-43	1996	Antimony	28	J	ug/L	6	AIP > Type 1	6.26	AIP > Type 2	40.88	<
IGW-11	1996	Arsenic	76	J	ug/L	50	AIP > Type 1	5.00	AIP > Type 2	5.00	AIP > Type 4
IGW-61	1996	Beryllium	4.83		ug/L	4	AIP > Type 1	31.29	<	--	--
IGW-21	1996	bis(2-ethylhexyl)phthalate	48	J	ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-26	1996	bis(2-ethylhexyl)phthalate	32	J	ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-30	1996	bis(2-ethylhexyl)phthalate	32	J	ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-60	1996	bis(2-ethylhexyl)phthalate	44	J	ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-63	1996	bis(2-ethylhexyl)phthalate	54		ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-10	1996	Cadmium	27.6		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-17	1996	Cadmium	24.8		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-2	1996	Cadmium	9.78		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-24	1996	Cadmium	25.7		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-27	1996	Cadmium	18		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-30	1996	Cadmium	10.7		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-61	1996	Cadmium	12.6		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-63	1996	Cadmium	11.9		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-8	1996	Cadmium	16.6		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-9	1996	Cadmium	12.1		ug/L	7.75	AIP > Type 1	7.82	AIP > Type 2	51.10	<
IGW-14	1996	Chloromethane	4.7	J	ug/L	3	AIP > Type 1	27.92	<	--	--
IGW-12	1996	Chromium	1620		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-17	1996	Chromium	999		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-19	1996	Chromium	706		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-2	1996	Chromium	1930		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-21	1996	Chromium	1980		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-22	1996	Chromium	1790		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-23	1996	Chromium	1200		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-24	1996	Chromium	740		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-25	1996	Chromium	3220		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-26	1996	Chromium	871		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-27	1996	Chromium	1310		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-28	1996	Chromium	1290		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-29	1996	Chromium	719		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-3	1996	Chromium	1050		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-30	1996	Chromium	967		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-36	1996	Chromium	1580		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-39	1996	Chromium	871		ug/L	621.75	AIP > Type 1	23464.29	<	--	--

Table 4-5. 1996 Sample Locations That Exceed HSRA Groundwater Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample ID	Date	Parameter	AIP Result	Qual	Units	Type 1 & 3 Standard	Status	Type 2 Standard	Status	Type 4 Standard	Status
IGW-40	1996	Chromium	786		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-41	1996	Chromium	1340		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-42	1996	Chromium	949		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-43	1996	Chromium	3460		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-45	1996	Chromium	1010		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-46	1996	Chromium	1470		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-47	1996	Chromium	1280		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-49	1996	Chromium	630		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-5	1996	Chromium	1490		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-52	1996	Chromium	627		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-53	1996	Chromium	893		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-54	1996	Chromium	675		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-55	1996	Chromium	2770		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-57	1996	Chromium	689		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-58	1996	Chromium	2470		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-59	1996	Chromium	1160		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-6	1996	Chromium	1020		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-61	1996	Chromium	1000		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-63	1996	Chromium	864		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-9	1996	Chromium	1110		ug/L	621.75	AIP > Type 1	23464.29	<	--	--
IGW-24	1996	cis-1,2-dichloroethene	44		ug/L	2	AIP > Type 1	156.43	<	--	--
IGW-28	1996	cis-1,2-dichloroethene	11		ug/L	2	AIP > Type 1	156.43	<	--	--
IGW-8	1996	cis-1,2-dichloroethene	5.4	J	ug/L	2	AIP > Type 1	156.43	<	--	--
IGW-9	1996	cis-1,2-dichloroethene	6300	J	ug/L	2	AIP > Type 1	156.43	AIP > Type 2	1022.00	AIP > Type 4
IGW-53	1996	Copper	3510		ug/L	1300	AIP > Type 1	625.71	AIP > Type 2	4088.00	<
IGW-16	1996	Lead	150		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-17	1996	Lead	180		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-2	1996	Lead	82		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-45	1996	Lead	90		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-5	1996	Lead	110		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-52	1996	Lead	75		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-53	1996	Lead	140		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-58	1996	Lead	204		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-61	1996	Lead	220		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-8	1996	Lead	121		ug/L	72.25	AIP > Type 1	72.25	AIP > Type 2	72.25	AIP > Type 4
IGW-17	1996	Mercury	2.2		ug/L	2	AIP > Type 1	0.40	AIP > Type 2	0.85	AIP > Type 4
IGW-27	1996	Mercury	3.4		ug/L	2	AIP > Type 1	0.40	AIP > Type 2	0.85	AIP > Type 4
IGW-61	1996	Mercury	3.2		ug/L	2	AIP > Type 1	0.40	AIP > Type 2	0.85	AIP > Type 4
IGW-10	1996	Methylene Chloride	12		ug/L	5	AIP > Type 1	54.07	<	--	--
IGW-63	1996	Methylene Chloride	31	J	ug/L	5	AIP > Type 1	54.07	<	--	--
IGW-8	1996	Methylene Chloride	11	J	ug/L	5	AIP > Type 1	54.07	<	--	--

Table 4-5. 1996 Sample Locations That Exceed HSRA Groundwater Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample ID	Date	Parameter	AIP Result	Qual	Units	Type 1 & 3 Standard	Status	Type 2 Standard	Status	Type 4 Standard	Status
IGW-9	1996	Methylene Chloride	11	J	ug/L	5	AIP > Type 1	54.07	<	--	--
IGW-12	1996	Nickel	498		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-19	1996	Nickel	208		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-2	1996	Nickel	489		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-21	1996	Nickel	479		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-22	1996	Nickel	518		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-23	1996	Nickel	309		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-25	1996	Nickel	875		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-26	1996	Nickel	392		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-27	1996	Nickel	480		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-28	1996	Nickel	447		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-29	1996	Nickel	248		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-3	1996	Nickel	267		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-30	1996	Nickel	258		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-36	1996	Nickel	360		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-39	1996	Nickel	250		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-40	1996	Nickel	209		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-41	1996	Nickel	261		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-42	1996	Nickel	255		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-43	1996	Nickel	606		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-45	1996	Nickel	205		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-46	1996	Nickel	453		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-47	1996	Nickel	194		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-5	1996	Nickel	263		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-52	1996	Nickel	208		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-53	1996	Nickel	443		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-55	1996	Nickel	891		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-57	1996	Nickel	200		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-58	1996	Nickel	606		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-59	1996	Nickel	326		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-6	1996	Nickel	368		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-60	1996	Nickel	214		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-61	1996	Nickel	229		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-62	1996	Nickel	233		ug/L	188.73	AIP > Type 1	312.86	<	--	--
IGW-63	1996	Nickel	377		ug/L	188.73	AIP > Type 1	312.86	AIP > Type 2	2044.00	<
IGW-10	1996	Trichloroethene	17		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-12	1996	Trichloroethene	30		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	<
IGW-13	1996	Trichloroethene	18		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-14	1996	Trichloroethene	340		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-17	1996	Trichloroethene	5100		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-24	1996	Trichloroethene	340		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4

Table 4-5. 1996 Sample Locations That Exceed HSRA Groundwater Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample ID	Date	Parameter	AIP Result	Qual	Units	Type 1 & 3 Standard	Status	Type 2 Standard	Status	Type 4 Standard	Status
IGW-26	1996	Trichloroethene	6.5		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-27	1996	Trichloroethene	6.5		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-28	1996	Trichloroethene	300		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-29	1996	Trichloroethene	91		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-3	1996	Trichloroethene	7.3		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-30	1996	Trichloroethene	550		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-31	1996	Trichloroethene	20		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-33	1996	Trichloroethene	62		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-34	1996	Trichloroethene	15		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-38	1996	Trichloroethene	53	J	ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-52	1996	Trichloroethene	130		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-53	1996	Trichloroethene	20		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-55	1996	Trichloroethene	110	J	ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-57	1996	Trichloroethene	12		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-63	1996	Trichloroethene	570	J	ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-8	1996	Trichloroethene	11000	J	ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-9	1996	Trichloroethene	62000	J	ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-9	1996	Vinyl Chloride	80	J	ug/L	2	AIP > Type 1	1.00	AIP > Type 2	1.00	AIP > Type 4
IGW-31	1996	Zinc	2710		ug/L	2000	AIP > Type 1	4692.86	<	--	--

"<" = AIP concentration is less than the HSRA groundwater standard.
"--" = No comparsion was initiated because Type 1, Type 2, or Type 3 standard was met.

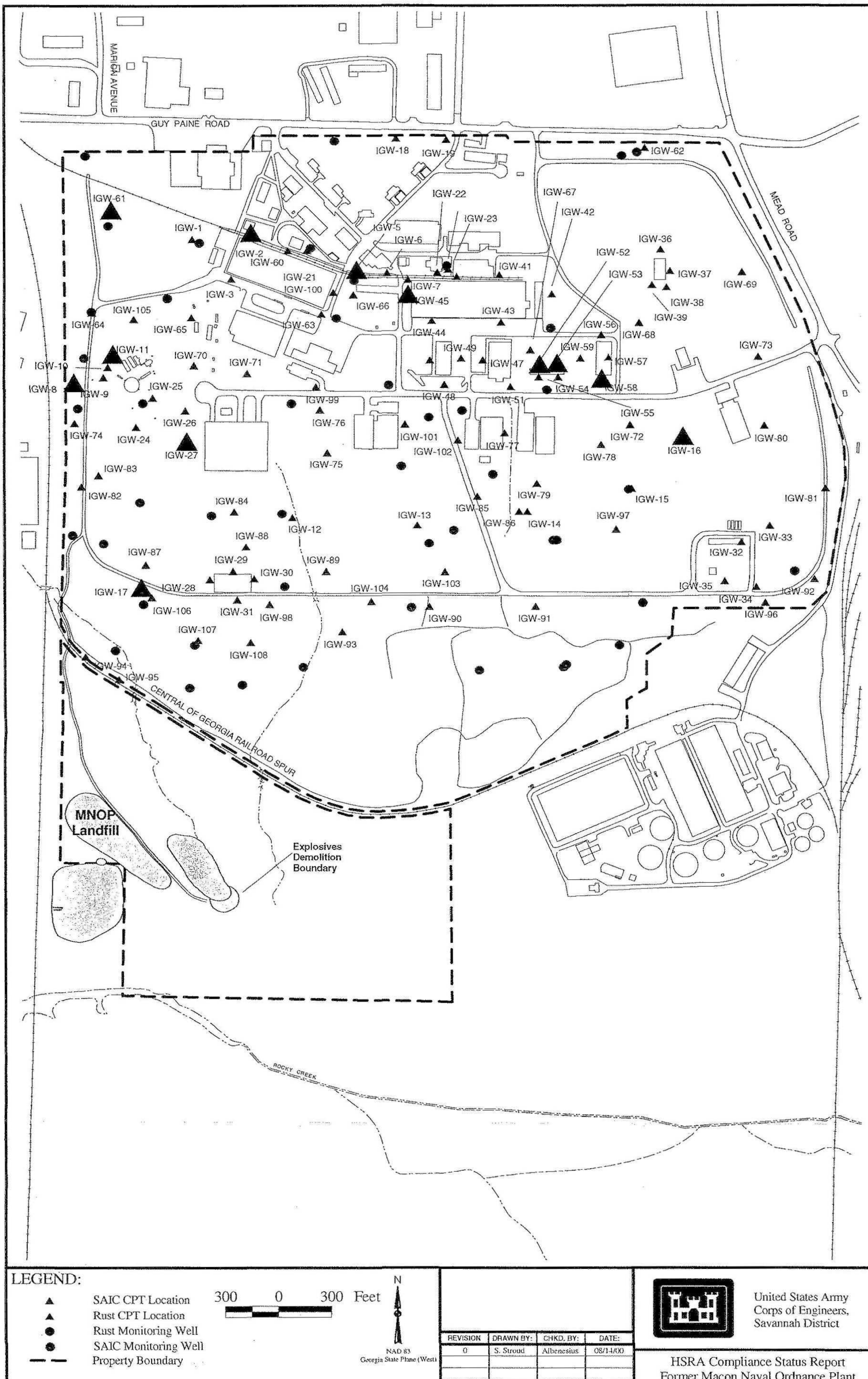

Figure 4-1. AIP Groundwater Stations that Exceed HSRA Standards for Inorganics

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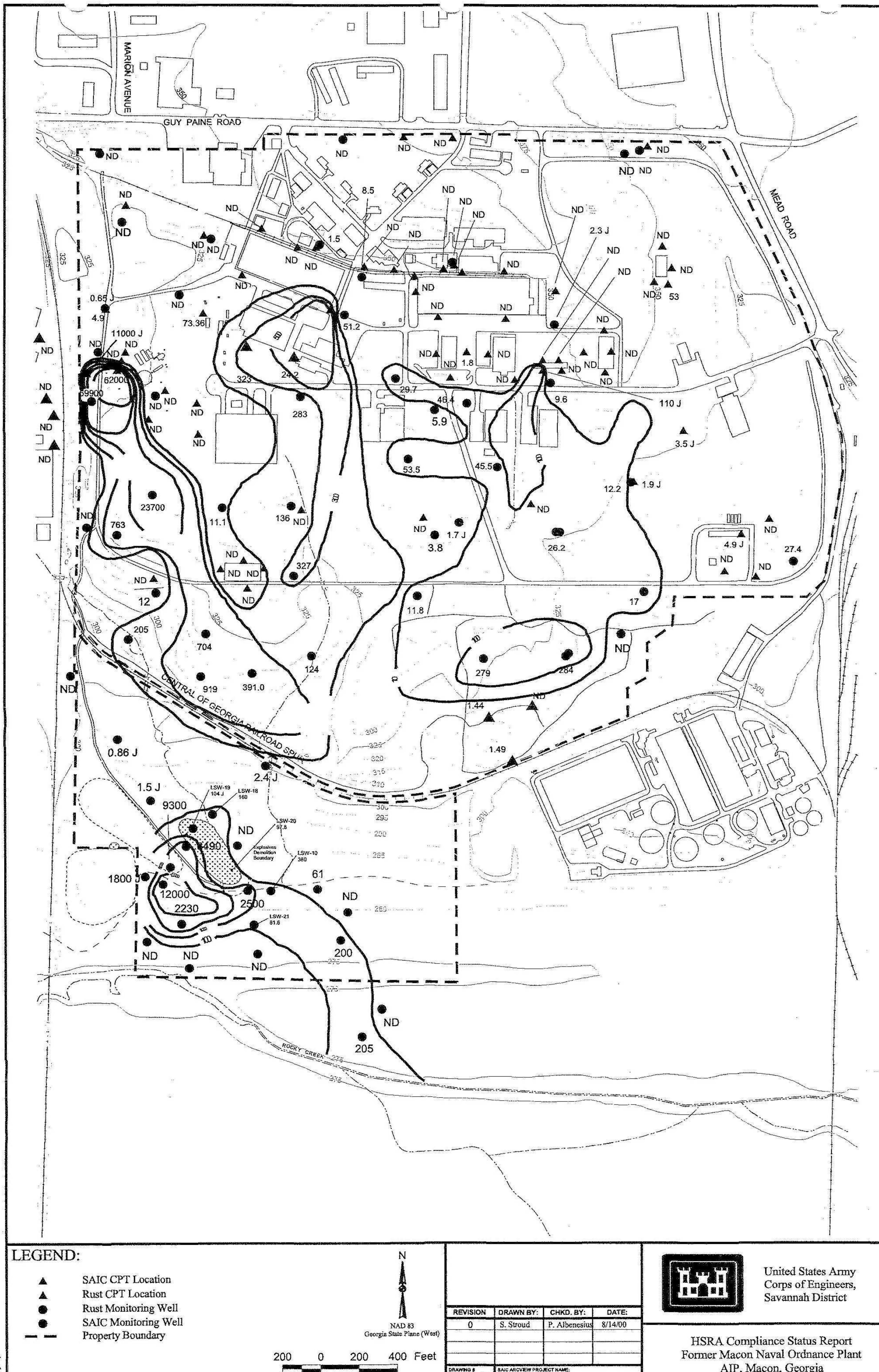

Figure 4-2. Extent of TCE Contamination in the Water Table Aquifer at the Allied Industrial Park and MNOP Landfill

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Figure 4-3. TCE Plume Map with HSRA Standard Demarcations

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Table 4-6. 1998 and 2000 Sample Locations That Exceed HSRA Groundwater Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sample ID	Date	Parameter	AIP Result	Qual	Units	Type 1 and 3 Standard	Status	Type 2 Standard	Status	Type 4 Standard	Status
IGW-70	04/28/1998	1,2-Dichloroethylene	2.4	J	ug/L	2	AIP > Type 1	140.79	<	--	--
IGW-76-01	04/29/1998	1,2-Dichloroethylene	3	J	ug/L	2	AIP > Type 1	140.79	<	--	--
MW47-GW1	11/09/1998	1,2-Dichloroethylene	1260		ug/L	2	AIP > Type 1	140.79	AIP > Type 2	919.80	AIP > Type 4
MW49-GW1	11/04/1998	1,2-Dichloroethylene	7.1		ug/L	2	AIP > Type 1	140.79	<	--	--
MW56-GW1	11/09/1998	1,2-Dichloroethylene	4.7	J	ug/L	2	AIP > Type 1	140.79	<	--	--
MW57-GW1	11/04/1998	1,2-Dichloroethylene	2.1	J	ug/L	2	AIP > Type 1	140.79	<	--	--
MW63-GW1	11/12/1998	1,2-Dichloroethylene	80.7		ug/L	2	AIP > Type 1	140.79	<	--	--
MW-64-GW1	11/12/1998	1,2-Dichloroethylene	12.1		ug/L	2	AIP > Type 1	140.79	<	--	--
MW-65-GW1	11/12/1998	1,2-Dichloroethylene	11.5		ug/L	2	AIP > Type 1	140.79	<	--	--
MW-66-GW1	11/12/1998	1,2-Dichloroethylene	83.9		ug/L	2	AIP > Type 1	140.79	<	--	--
IGW-100	04/27/1998	bis(2-Ethylhexyl)phthalate	67	J	ug/L	6	AIP > Type 1	60.83	AIP > Type 2	204.40	<
IGW-66	04/28/1998	bis(2-Ethylhexyl)phthalate	52.7	J	ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-99	04/28/1998	bis(2-Ethylhexyl)phthalate	29.7	J	ug/L	6	AIP > Type 1	60.83	<	--	--
MW32-DP	10/28/1998	bis(2-Ethylhexyl)phthalate	50		ug/L	6	AIP > Type 1	60.83	<	--	--
MW32-GW1	10/28/1998	bis(2-Ethylhexyl)phthalate	99.6		ug/L	6	AIP > Type 1	60.83	AIP > Type 2	204.40	<
MW35-GW1	11/02/1998	bis(2-Ethylhexyl)phthalate	20		ug/L	6	AIP > Type 1	60.83	<	--	--
MW62-GW1	11/04/1998	bis(2-Ethylhexyl)phthalate	51.8		ug/L	6	AIP > Type 1	60.83	<	--	--
IGW-76-01	04/29/1998	Carbon Tetrachloride	6.9		ug/L	5	AIP > Type 1	1.07	AIP > Type 2	4.34	AIP > Type 4
MW35-GW1	11/02/1998	Chloroethane	3	J	ug/L	1	AIP > Type 1	293.68	<	--	--
IGW-70	04/28/1998	cis-1,2-Dichloroethylene	2.4	J	ug/L	2	AIP > Type 1	156.43	<	--	--
IGW-76-01	04/29/1998	cis-1,2-Dichloroethylene	3	J	ug/L	2	AIP > Type 1	156.43	<	--	--
MW45-GW1	11/09/1998	Methylene Chloride	1200	J	ug/L	5	AIP > Type 1	54.07	AIP > Type 2	119.23	AIP > Type 4
MW47-GW1	11/09/1998	Methylene Chloride	521	J	ug/L	5	AIP > Type 1	54.07	AIP > Type 2	119.23	AIP > Type 4
PZ-3	11/05/1998	Trichloroethylene	5.9		ug/L	5	AIP > Type 1	20.77	<	--	--
MW33-GW1	10/28/1998	Trichloroethylene	9		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-78-01	05/06/1998	Trichloroethylene	9.6		ug/L	5	AIP > Type 1	20.77	<	--	--
MW44-GW1	11/04/1998	Trichloroethylene	9.6		ug/L	5	AIP > Type 1	20.77	<	--	--
MW48-GW1	11/05/1998	Trichloroethylene	11.1		ug/L	5	AIP > Type 1	20.77	<	--	--
MW68-GW1	11/06/1998	Trichloroethylene	11.8		ug/L	5	AIP > Type 1	20.77	<	--	--
PZ-5	11/12/1998	Trichloroethylene	12		ug/L	5	AIP > Type 1	20.77	<	--	--
MW73-GW1	11/04/1998	Trichloroethylene	12.2		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-72-01	04/16/1998	Trichloroethylene	13.3	J	ug/L	5	AIP > Type 1	20.77	<	--	--
MW71-GW1	11/06/1998	Trichloroethylene	17		ug/L	5	AIP > Type 1	20.77	<	--	--
IGW-206-01	2000	Trichloroethylene	24.6		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	<
MW62-GW1	11/04/1998	Trichloroethylene	26.2		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	<
MW72-GW1	11/03/1998	Trichloroethylene	27.4		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	<
MW42-GW1	11/03/1998	Trichloroethylene	30		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	<
MW42-DP	11/03/1998	Trichloroethylene	31		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	<
MW51-GW1	11/03/1998	Trichloroethylene	45.5		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW43-GW1	11/03/1998	Trichloroethylene	46.4		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW35-GW1	11/02/1998	Trichloroethylene	51		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW60-GW1	11/04/1998	Trichloroethylene	53.5		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4

Table 4-6. 1998 and 2000 Sample Locations That Exceed HSRA Groundwater Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant (Continued)

Sample ID	Date	Parameter	AIP Result	Qual	Units	Type 1 and 3 Standard	Status	Type 2 Standard	Status	Type 4 Standard	Status
IGW-89-01	04/30/1998	Trichloroethylene	54.7		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-70	04/28/1998	Trichloroethylene	61.3		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW-72-01	06/13/2000	Trichloroethylene	91.2		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW-70A-01	06/13/2000	Trichloroethylene	104	J	ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW67-GW1	11/06/1998	Trichloroethylene	124		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW57-GW1	11/04/1998	Trichloroethylene	136		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-77-01	04/24/1998	Trichloroethylene	144		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-76-01	04/29/1998	Trichloroethylene	179		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW63-GW1	11/12/1998	Trichloroethylene	205		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW69-GW1	11/11/1998	Trichloroethylene	279		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW49-GW1	11/04/1998	Trichloroethylene	283		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW70-GW1	11/11/1998	Trichloroethylene	284		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
IGW-205-01	2000	Trichloroethylene	323		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW58-GW1	11/06/1998	Trichloroethylene	327		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW-62A-01	06/13/2000	Trichloroethylene	371		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW-64-GW1	11/12/1998	Trichloroethylene	704		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW56-GW1	11/09/1998	Trichloroethylene	763		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW-65-GW1	11/12/1998	Trichloroethylene	919		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW-66-GW1	11/12/1998	Trichloroethylene	3910		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW47-GW1	11/09/1998	Trichloroethylene	23700		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW45-GW1	11/09/1998	Trichloroethylene	59900		ug/L	5	AIP > Type 1	20.77	AIP > Type 2	40.30	AIP > Type 4
MW63-GW1	11/12/1998	Vinyl chloride	3	J	ug/L	2	AIP > Type 1	1.00	AIP > Type 2	1.00	AIP > Type 4

"<" = AIP concentration is less than the HSRA soil standard.
"--" = No comparsion was initiated because Typ1, Type 2, or Type 3 standard was met.

As seen on Table 4-6, there are noticeable differences from the 1996 data set. Specifically, no inorganic constituents exceeded Type I groundwater standards. There were over 20 monitoring well samples that were analyzed for metals. This result supports the position that the numerous inorganic detections from the 1996 data set were due to sampling methodology rather than actual hydrogeologic conditions.

The 1998/2000 data set, however, substantiates and further defines extent for many of the organic chemicals. Organic constituents that exceed Type 4 groundwater standards include 1,2-DCE (MW-47), carbon tetrachloride (IGW-76), methylene chloride (MW-45 and MW-47), TCE (25 stations) and vinyl chloride (MW-63). As with the 1996 data set, the TCE contamination documented in the 1998/2000 sampling at the site is clearly the greatest concern with the maximum 1996 detection of TCE (59,900 ug/L at MW-45) three orders of magnitude higher than the Type 4 standard (40 ug/L). A plume map of the TCE concentrations across the AIP was developed using all data (1996, 1998, and 2000) and is presented on Figure 4-2. The Type 1, 2, 3, and 4 groundwater standards appear as different color lines on the figure. 1,2-DCE and vinyl chloride are a concern at the AIP because they are degradation products of TCE.

As seen in Figure 4-2, the lateral extent of the TCE plumes has been effectively defined. There are three distinct plume areas on the AIP. Interpretation of these plumes is provided in Section 5.0. There are geologic factors (see Section 3.0 and Section 5.0) that are preventing the western migration of the westernmost TCE plume. As documented in Section 3.0 and Section 5.0, groundwater flow is south toward the Landfill and the nearby bottomland swamp. The westernmost plume has the highest concentrations and covers a larger area. A large portion of the western plume exceeds the Type 4 HSRA groundwater standard. The middle plume represents a much smaller area where Type 4 standards are exceeded (Figure 4-2). The vertical extent of contamination is briefly discussed in Section 4.3.3 and covered in more detail in Section 5.0.

4.3.3 Production Wells and Deep Groundwater

During 1998, two production wells on the AIP were sampled for VOCs. No VOCs were detected in the Georgia Hydrate production well (GHW-1; see Figure 2-5 for location). There was a single detection of TCE in Armstrong production well #6 (AWL-6; see Figure 2-5 for location). The detection 1.3 ug/L (j-flagged) is less than the Type 1 standard (5 ug/L).

In addition to these two production wells on the AIP, there was one CPT sample that was pushed below the base of the Water Table Aquifer. CPT sample IGW-67-02 (Figure 2-5) was collected at a depth of 98 feet bls and represents a sandy layer within the MNOP Confining Unit. There were a few low detections (methyl bromide, 2-butanone, and TCE) associated with this sample (See summary table in Appendix O). When screened, none of these detections exceeded the Type I groundwater standard (Appendix J).

In addition to these deep groundwater samples, there were two samples collected during 2000 that represent the bottom of the Water Table Aquifer (MW-70A and MW-62A). Both of these wells were placed within the defined plume in the southeast quadrant of the AIP, but at the base of the Water Table Aquifer. Both of these wells had detections of TCE that exceeded the type 4 HSRA groundwater standards.

While none of the available deep (Tuscaloosa) groundwater samples from the AIP had organic concentrations that exceeded the Type 1 HSRA standards, there were several organic detections. Groundwater samples from the Tuscaloosa Aquifer at the Landfill also exhibited low concentrations of TCE. When considered in tandem with the high TCE concentrations from the lower portions of the Water Table Aquifer (MW-62A and MW-70A), these detections suggest that migration from the Water Table Aquifer may be occurring to some degree and that the vertical extent of the TCE plume may not yet be fully documented. Further discussion of contaminant transport is provided in Section 5.0.

4.4 Sediment

Sediment samples consisted of four samples taken from stations in the middle drainage feature that leads from the Politex property to Rocky Creek (see Figure 2-6). A summary of sediment data is presented in Appendix O. The raw data are presented in Appendix N.

The HSRA screen of sediment consisted of screening against the soil HSRA standards. The HSRA screening of sediment is provided in Appendix J. No detected analytes exceeded the Type I soil standards. There were no detections of TCE or its associated degradation products in sediment. There were no detections of any PCBs.

4.5 Surface Water

Two surface water stations were sampled in the middle drainage feature that leads from the Politex property to Rocky Creek (see Figure 2-6). Both filtered and unfiltered samples were collected to assess the potential for PCB contamination associated with particulate matter. A summary of surface water results is provided in Appendix O. The raw data are provided in Appendix N. The middle drainage was sampled in order to ascertain if the TCE plume was expressing into the drainage feature.

The detected analytes are screened versus the Georgia Water Quality Standards (Ch 391-3-6) in Table 4-7. No constituents exceed the standards. Carbon disulfide was the only volatile compound detected. There were no detections of TCE or any of its degradation products in surface water.

4.6 Summary of Hazardous Site Response Act Screen

The available soil, groundwater, surface water, and sediment data from the AIP were screened to assess the compliance with HSRA standards.

AIP soil is currently in compliance with Type 4 HSRA standards. Only two locations exceeded Type 2 standards (ISL-4 and ISL-117-02). Thus, a limited remedial action could potentially bring the AIP into compliance with Type 2 standards.

Groundwater in the Water Table Aquifer at the AIP does not comply with HSRA standards primarily due to the extensive TCE contamination. The plumes have been laterally defined as seen on Figure 4-2. The areas that exceed the HSRA standards are broad. There are three distinct plume areas on the AIP. Interpretation of the fate and transport and potential source areas of the TCE plumes is provided in Section 5.0.

AIP sediment is in compliance with Type 1 HSRA standards for soil.

AIP surface water is in compliance with the Georgia Surface Water Quality standards.

Table 4-7. Surface Water Detections and Comparison with GA Water Quality Standards
Allied Industrial Park
Former Macon Naval Ordnance Plant

Sample	Collection Date	Parameter	Result	Units	Qualifier	Georgia Standard (ug/L)	AIP Exceeds?
ISW-202-01	03/11/2000	Nickel	3.2	UG/L	J	88	No
ISW-202-01	03/11/2000	Zinc	28.6	UG/L		58	No
ISW-202-01A	03/11/2000	Carbon disulfide	5.1	UG/L		None	No
ISW-202-01A	03/11/2000	Nickel	1.2	UG/L	J	88	No
ISW-202-01A	03/11/2000	Zinc	28.2	UG/L		58	No
ISW-203-01	03/10/2000	Zinc	34.6	UG/L		58	No

GA Water Quality Standards are freshwater, taken from the GA administrative code (Ch 391-3-6)

5.0 CONTAMINANT FATE AND TRANSPORT

The primary groundwater contaminants detected at the AIP include TCE, 1,2-DCE, and vinyl chloride. These constituents are classified as VOCs, and are grouped as chlorinated hydrocarbons. These contaminants have fairly high vapor pressures and low adsorption coefficients, indicating that they are readily transported through soil with a low potential for adsorption to sediments. TCE and related chemicals possess high Henry's Law Constants, which suggest that the concentration of these compounds in surface water may be effectively reduced by evaporation.

The introduction of TCE into groundwater, however, presents a more complex situation in which the chemical concentrations are slowly reduced through biodegradation and a limited amount of volatilization into the vadose zone (for water table aquifers). Biodegradation of chlorinated hydrocarbons occurs primarily as an anaerobic process, where halogens are iteratively stripped from the chemical molecules until a nonhalogenated compound remains. Dehalogenation of TCE, for example, proceeds from TCE to multiple isomers of DCE (1,1-DCE, cis-1,2-DCE, and trans-1,2-DCE), followed by reduction to vinyl chloride and, finally, ethene. However, research has shown that complete dehalogenation in the subsurface is difficult to achieve (Chappelle 1993).

5.1 Horizontal Extent Of Contamination

A map was generated to show the horizontal extent of TCE contamination at the AIP and MNOP Landfill (Figure 5-1). The TCE plumes illustrated on the map show that contamination from the AIP, extends to the south, terminating near the location of the Central of Georgia railroad spur. The western AIP plume shown on the map may discharge to the central drainage (although no TCE was detected in 2000 surface water/sediment sampling) and, ultimately, to Rocky Creek; however, groundwater contamination from the MNOP Landfill is defined as a distinctly separate contaminant plume than those shown for the AIP.

The map illustrates that there are three distinct plumes of groundwater contamination, apparently all originating within the AIP. All three plumes are oriented north to south, generally in the direction of groundwater flow within the Water Table Aquifer. The westernmost plume originates in the vicinity of monitoring well MW-45 where a concentration of 59,900 ppb was measured in 1998. This plume is oriented in a more southeasterly direction than the other two plumes. Soil samples from two stations (ISL-117 and ISL-8) in this area had TCE concentrations that exceeded HSRA soil standards.

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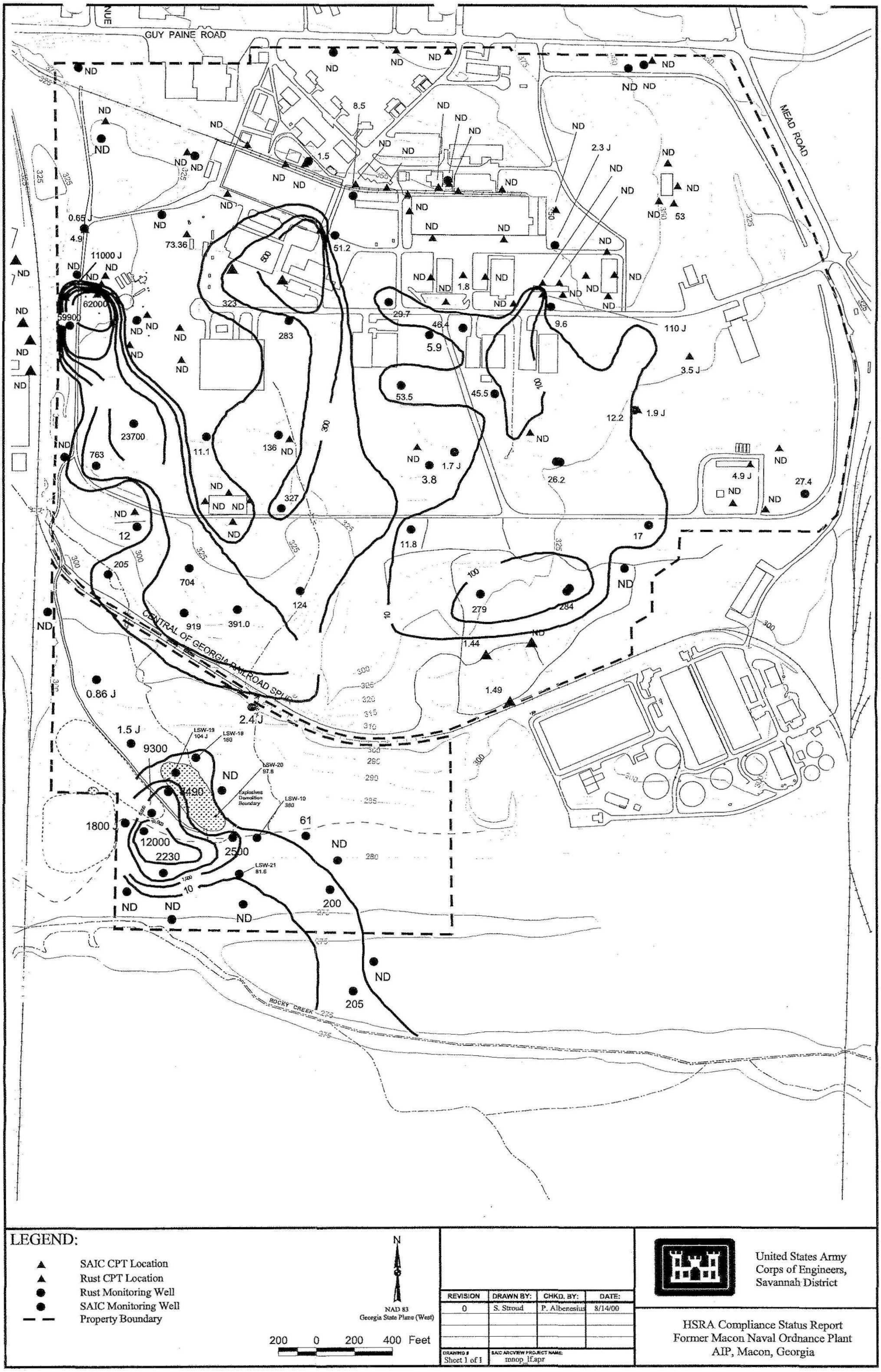

Figure 5-1. Extent of TCE Contamination in the Water Table Aquifer at the Allied Industrial Park and MNOP Landfill

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Cone penetrometer testing on the adjacent property, Armstrong World Industries, revealed that VOC groundwater contamination above the MNOP Confining Unit is not present across the western property boundary. Four CPT groundwater sampling pushes were conducted in a north-south line just west of the AIP/Armstrong boundary. The southernmost push was unsuccessful in collecting groundwater, even after several attempts to move and re-push. The conclusion is that those south most push attempts encountered a very fine grained feature which may account for the plume migrating away from the property boundary in a southeasterly orientation. This is a positive finding in that it indicates that groundwater contamination from the AIP is not migrating onto Armstrong property.

Drawings indicate, and evidence on the ground corroborates, that a waste water treatment facility (WWTF) once existed just east of, and uphill of, the hot spot of the westernmost plume. Aerial photographs (EPA 1999) suggest that the WWTF existed as early as 1951 and was out of operation by 1972.

Moving east from the western boundary, a middle plume is defined. This plume consists of much lower concentrations with the highest measured concentration at IGW-63 of 570 ppb. The apparent source of this plume is in the vicinity of the present day Johns Manville property. Previous investigation by Rust revealed low detections of TCE (ISL-4, 1.2 mg/kg) in soil near the hot spot of this middle plume. Additional soil sampling in 2000 to attempt to better define sources, failed to detect any significant soil contamination. At the 100 ppb concentration, the middle plume coalesces with the western plume. There are a significant number of non-detects separating the upstream nodes of the two plumes, but downgradient of the southern AIP perimeter road, one broad plume migrates all the way to the abandoned central of Georgia railroad spur. The coalesced plume seems to suddenly end at the railroad spur leading to speculation that two surface drainages intercept the contaminated groundwater and convey it to Rocky Creek. Sampling of the westernmost drainage in 1998 and the middle drainage in 2000 did not reveal significant VOC contamination. Therefore, the downgradient edge of the plume may have been accurately characterized at the old railroad spur.

Travel time from the old WWTF to the railroad spur can be easily estimated. The lateral hydraulic gradient for the Water Table Aquifer is 0.015 ft/ft. Using an average hydraulic conductivity of 14.8 ft/day and an effective porosity of 0.30 for coarse sands, the groundwater velocity can be calculated using the following equation:

$$V = {}^{KI}\!/_{n_e} \frac{(14.8 \text{ ft/day})(0.015 \text{ ft/ft})}{0.30}$$

Multiplying by 365 days/year yields 270 ft/year.

The length of the plume from the apparent source to its downgradient limit is approximately 2,500 ft. Dividing by 270 ft/yr, the travel time is between 9 and 10 years. Aerial photographs indicate that the WWTF operated from as early as 1951 and no later than 1972. The lateral definition of the TCE plume does not support the conclusion that the historical WWTF operation is the source of the westernmost plume. Given that the WWTF operation ended by 1972 (allowing 30 years of transport), a broader and more dispersed plume configuration would be expected for highly mobile compounds such as TCE. The highly concentrated and well-defined TCE isopleths (Figure 5-1) indicate the TCE plume is relatively young. These positions are supported when considering the relatively high K values obtained in the area. One possible explanation is potential recent releases from old drains in the industrial areas. These drains could still be in use and could lead to the former WWTF rather than the sanitary sewer.

A third AIP plume is evident in the middle to eastern portion of the site. The apparent source is Building Number 108, which was used as a pelleting facility during MNOP operations. The highest concentration at the upgradient limit of this plume is 144 ppb at IGW-77. The 100 ppb contour defines a very narrow and short plume. The 10 ppb contour describes a much more amorphous shape and a much broader area. Within the plume, and downgradient of the southern AIP perimeter road, concentrations increase to as high as 371 ppb (MW-62A). This suggests that this eastern plume is perhaps an old plume and that a slug or pulse of TCE contamination has migrated a significant distance downgradient and is presently at higher concentrations than any remaining soil source.

During the 2000 investigation, two new monitoring wells were installed at locations MW-62 and MW-70. These monitoring wells were installed to investigate the lower portion of the Water Table Aquifer in an area where it exceeds 30 ft in thickness. At MW-70A, the measured TCE concentration was 104 ppb. At the same location, MW-70 contained 284 ppb of TCE. At MW-62A, TCE was measured at 371 ppb and at the same location, MW-62 contained 26.2 ppb. This finding is revealing in that it shows that in at least some cases the higher concentrations of TCE are in the lower portion of the aquifer and that the shape of the plume as depicted is not entirely accurate, begging more data from the lower part of the aquifer.

At one location, MW-72, separate from any plumes and near the easternmost boundary of the AIP, TCE was detected (27.4 ppb) in 1998 above the MCL. In 2000, MW-72 was resampled to investigate the possibility that the 1998 detection was an anomaly. The 2000 result was 91.2 ppb. MW-72 is surrounded by non-detects from CPT screening level data. It is located just east of the Georgia Hydrate Plant, and next to an old truck scale.

5.2 Vertical Extent of Contamination

The migration of TCE in the subsurface is not restricted to horizontal transport in the Water Table Aquifer. Vertical migration is also an important consideration. There are two scenarios for discussion in the context of vertical migration of contamination. The first is vertical migration within the Water Table Aquifer and the second is vertical migration within and across the MNOP Confining Unit.

Two well clusters, MW-62/-62A and MW-70/-70A, are located in the southeastern quadrant of the AIP, where the Water Table Aquifer is thickest. Based on water level measurements, there is a barely discernable head difference of 0.02 ft at MW-62/-62A in a downward direction and a slight difference of 0.15 ft at MW-70/-70A, in an upward direction. Therefore, there is no evidence of any hydraulic mechanism for the downward migration of contamination within the Water Table Aquifer. The vertical distribution of TCE within the aquifer may be more affected by water chemistry and subsurface structure than groundwater hydraulics. Figure 5-2 is a cross section showing groundwater elevation and TCE concentrations at the MW-62/-62A and MW-70/70A well clusters.

There are no wells at the AIP screened in the Tuscaloosa Aquifer. However, a CPT groundwater sample was collected from a sandy layer within the MNOP Confining Unit at location IGW-67. The sample was collected from a depth of 98 ft under 12 ft of continuous clay and clayey material. A trace amount of TCE was detected in this sample (2 ppb). IGW-67 is located just outside of the 10 ppb isopleth for the middle TCE plume.

Data from wells screened in the Tuscaloosa Aquifer at the MNOP Landfill indicate that migration through the MNOP Confining Unit is possible (SAIC 2000). Similar conditions would be expected at the AIP.

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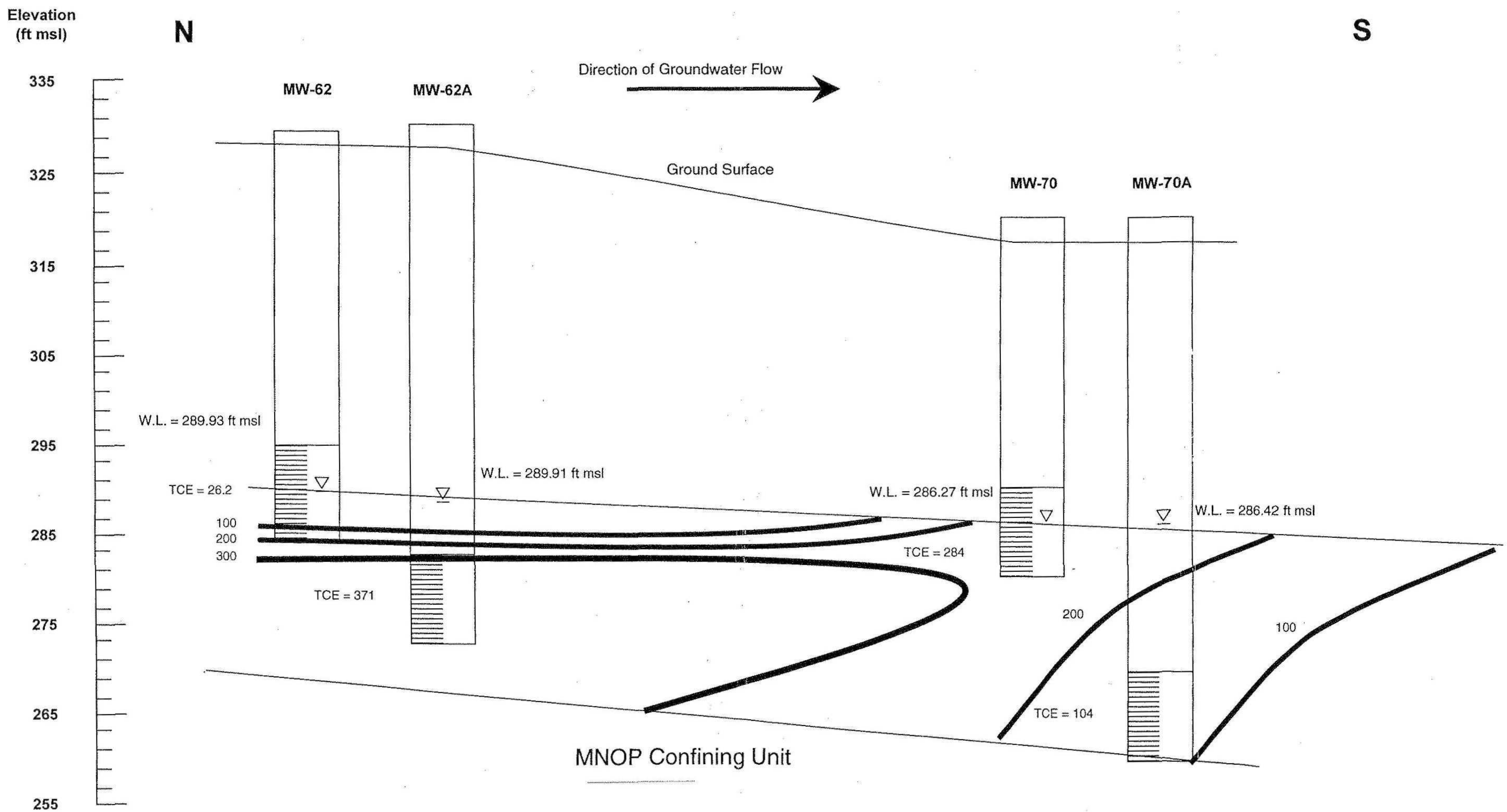

Figure 5-2. Contaminant Cross-Section for MW-60/MW-60A and MW-70/MW-70A Well Clusters

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Environmental investigations of the AIP were conducted in 1996, 1998 and 2000. These investigations included the collection of soil, groundwater, surface water, and sediment for chemical analyses. In addition, numerous soil borings, coreholes, and soil samples were taken to characterize the local hydrogeologic conditions. The data resulting from these investigations were compiled, presented, and interpreted in this HSRA compliance status report. The primary concern at the AIP is the existing TCE contamination in the Water Table Aquifer. This contamination is areally extensive and is migrating toward the Rocky Creek floodplain. There is evidence that vertical migration to the bottom of the Water Table Aquifer and also to the underlying Tuscaloosa Aquifer may be occurring. Results and interpretations for the AIP are presented in subsequent sections.

6.1.1 Soil

The HSRA screening of AIP soil samples identified relatively few constituents that exceeded Type 1 HSRA standards. Only TCE exceeded the Type 2 HSRA standards. TCE exceeded the standards only at locations ISL-4 and ISL-117. All soil samples were in compliance with Type 4 HSRA standards.

The limited number of constituents and sample locations that exceeded HSRA standards is indicative of the relatively low impact associated with this medium. No clear source areas were found in relation to the TCE plume. Given the few stations that exceeded the HSRA standards, a limited soil removal could potentially bring the AIP into compliance with the Type 2 (residential) HSRA standards.

6.1.2 Groundwater

The primary concern with groundwater at the AIP are the TCE plumes across the site. Other constituents that exceeded HSRA standards were limited to one or two stations whereas TCE exceeded HSRA standards at many stations. The lateral extent of the TCE plumes has been defined (see Figure 4-2). There are three distinct plumes of groundwater contamination identified by the 1998 and 2000 investigations all originating within the AIP. All three plumes are oriented north to south, generally in the direction of groundwater flow within the Water Table Aquifer. These plumes of contamination are generally associated with areas of increased hydraulic conductivity identified in the hydrogeologic investigation (Section 3.0). A majority of the plume concentrations do not comply with any of the HSRA standards.

The vertical extent of the plume is considered well characterized in the northern portions of the AIP, where the Water Table Aquifer is thin (< 15 feet thick). However, current data indicate the southeastern quadrant of the AIP has a greater water table thickness (> 30 feet thick). Monitoring wells installed during the 2000 field investigation were screened near the base of this thicker water table area. Results from these wells indicate significant TCE contamination exists at the base of the Water Table Aquifer. Results from the underlying Tuscaloosa Aquifer at the MNOP Landfill indicate that TCE contamination has migrated across the MNOP Confining Unit, south of the AIP. Similar hydrologic conditions would be expected at the AIP.

The presence of the elevated organic concentrations at the base of the Water Table Aquifer and TCE concentrations in the Tuscaloosa Aquifer at the MNOP Landfill indicate the vertical extent of groundwater contamination at the AIP may not be completely defined. There is a high degree of concern over potential vertical migration since the Tuscaloosa Aquifer is the source of several operating industrial production wells on and adjacent to the AIP. Although local production wells are reportedly only used as a source of industrial process water, contamination in a significant regional aquifer system should be cause for concern.

6.1.3 Surface Water and Sediment

Samples of surface water and sediment in the central drainage feature indicate it is not impacted by any AIP related constituents. There were no detections of TCE in the drainage feature. This indicates the water table plume is not expressing into this feature during periods of low water table, although it is possible that groundwater could intersect this drainage feature during periods of high water table. Given the minimal number of constituents and concentrations documented in surface water and sediment, these media are not considered a concern. No PCBs were detected in sediment, indicating this area is not a source for Rocky Creek PCB contamination.

No sediment results exceeded the HSRA Type 1 soil standards. No surface water result exceeded the Georgia Water Quality Standards.

6.2 Recommendations

The investigation results confirm the presence of groundwater contamination across the AIP. Groundwater does not comply with any HSRA standards. Soil complies with Type 4 standards. Sediment complies with Type 1 standards and surface water complies with water quality standards.

The following recommendations are based on these observations:

1. No further action is required for sediment and surface water.

2. In the corrective action plan, consideration should be given to the removal or treatment of soil associated with location ISL-4 and ISL-117. Removal/treatment of the locations would facilitate the AIP soil compliance with Type 2 HSRA standards.

3. The vertical extent of groundwater contamination in the southern portion of the TCE plume is only defined to a limited extent. This area should be further defined in subsequent investigations.

4. Any subsequent groundwater investigations should focus on TCE and its degradation products, particularly in the lower portions of the Water Table Aquifer and the underlying Tuscaloosa Aquifer.

5. Consideration should be given to eliminating the use of production wells located on the AIP, or in routine monitoring of nearby production wells to determine impacts, if any, from AIP groundwater contamination.

6. Periodic, routine (annual or semi-annual) monitoring of AIP wells should be implemented to further study the rate of migration and natural attenuation of contaminated groundwater.

7. A program should be considered to grout up or otherwise cause to be inoperable, any remaining drains or culverts associated with the old WWTF.

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HSRA Compliance Status Report
DERP-FUDS Project No. I04GA081302
Former Macon Naval Ordnance Plant
Allied Industrial Park (HSI #10308)
Macon, Georgia

Prepared For

U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT

Contract No. DACA21-95-D-0022
Delivery Order 017

Volume II - Appendices

August 2000

SAIC

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APPENDIX A
Field Notes

RECORD

Allied Industrial Park

Book #1

Macon Naval Ordnance Plant Landfill

1. Soil Gas pp. 1-17
2. Coring pp. 25-59
Cone Penetrometer pp 61-135
Slug Tests pp. 137-15[illegible]

IGW-69	43	43
IGW-68	$\overset{D}{55}$ + 65	65
IGW-73	$\overset{D}{20}$ + 32	32
IGW-72	13 + $\overset{R}{13}$ + 11 + 14.5 + 58	109.5
IGW-80	30	30
IGW-81	$\overset{D}{21}$ + 26	26
IGW-92	$\overset{R}{13}$ + 26	39
IGW-96	20	20
IGW-67-01	55	~~55~~
IGW-67-02	100	100
IGW-79-01	55	
IGW-79-02	85 + 29	114
IGW-77-01	55	
No Sample IGW-77-02	69	69
No Sample IGW-78		
	908	647.50

No Sample IGW-97

F

Macon Naval Ordnance Plant and
Allied Industrial Park HSRA Investigation.
PW Albenesius - Principal Investigator.
February 27, 1998

0900 PW Albenesius and Bruce Kristiansen don hip waders and enter Rocky Creek swamp just downstream of I-75.
Photos # 1 and #2 are discarded drums in swamp behind Masters Economy Inn on Pio Nono.
Photo # 3 looking across I-75. Chain link fence separates swamp from the interstate. Sewer manhole in middle of photo. Interstate berm in background. We are at the extreme upstream end of the study area.
Photo # 4 is looking downstream but still apparently in the swamp. My back is against the interstate fence. Background of the photo shows floating trash.
Photo #5 Drum located in area of what we believe to be the main Channel. We have been walking alongside I-75 from the backside of Masters Inn (to the south ?).
We have walked ~ 1000 FT.
Photo # 6 is looking upstream in what appears to be the main channel. We are adjacent to an interstate sign that says "Neon Daringly Bare".

Not Used 2/27/98 DWA

14

Photo # 7. Adjacent to main channel at point where it crosses under the I-75. Interstate bridge in background of photo.
Photo # 8. Main channel! Bridge in background. Same spot (standing) as Photo # 7. Photo # 8 is to the left of # 7.
Finding lots of freshwater ~~poly~~ pelecypods on sandbars. 10-25 mm wide shells.
Photo # 9 Uninvited passenger on PWA's hat
0915 Out of Swamp.
Photos # 10, and # 11. Sewage overflow onto ground behind motel. Woodline is Rocky Creek swamp. White stuff is probably lime to control smell of Sewage.
1400 Photo # 12. Drum in Rocky Creek Swamp. Photo looks North toward MNOP Landfill. Just in swamp adjacent to MNOP Landfill.
Photo # 13 Looking west toward Railroad trestle upstream Rocky Creek. Turbulent flow and flooded banks evident.
Photo # 14. Well MW-7 Looking North toward MNOP Landfill. This well is way out in swamp.
1430 Leaving site.
End 2/27/98

DWA 2/27/98

Not Used 3/6/98 RWA

0745

0755

0800

0820

0850

0910

09

09

March 6, 1998

PW Albenesius and Bruce Krishiansen at AIP to install control phase soil gas collectors

0745 On site. Checked Tom Yocum's office. He was not in yet.

0755 At ISG-5 location to install first soil gas collector. Found suitable location in grassy corner of fenced area that corresponds to RUST DPT boring ISG-63. Started pouring rain so we retreated to rental car.

0800 Waiting for rain to abate.

0820 Reconned several other locations from the car.

0850 Stopped by Tom Yocum's office and let him know we were here.

0910 Rain doesn't look like it is going to abate so we are going to go ahead and start installing collectors. There are two collectors for each location. One has a yellow cap and one has a white cap. One is for VOCs and one is for SVOCs. We will label the vials W and Y to keep track of which is which. I will call Paul Henning of Quadrel labs to determine which color goes with which analyses.

0915 Installing ISG-5 at previously described location on Schuller property. Drizzling.

0930 Installed ISG-6, 101.8 FT from SE corner of Building 107 on a 43° azimuth. Rain has stopped.

Not Used 3/6/98 PWA

09

09

10

10

0945 Installed ISG-8, 25 FT due East of Bldg 108 western flagpole. Rain has Completely stopped.

0955 Installed ISG-7, 60 FT from SW corner of Bldg 108 on 135° azimuth. Some blue sky starting to appear. Installed collectors in grassy area. Each time, we are covering collectors with soil.

1005 Installed ISG-2, 60 FT from NE corner of Bldg 106A, on 149° azimuth, in grassy area. Ambient air temp is 55° F.

1010 Installed ISG-11, 70 FT from SE corner of Bldg 106 A on 217° azimuth in grassy area. At each location we have walked around and attempted to positively identify the RUST sampling location and thus far have not found any grout at surface. Based on many locations we are confident that we are placing soil gas collectors in very near proximity of previous sampling locations.

Note: Ground has been saturated at every location.

1045 Installed ISG-1. In grassy area east of western perimeter road and south of RR. Standing water throughout grassy field. Lone monitoring well w/ SS casing used as reference. ISG-1 installed 40 FT from well on 78° azimuth.

1050 Identified well from Rust report as ISG-1.

1105 Installed ISG 4, 143°, 208 FT from Apex of road intersection where western perimeter road turns east toward AIP.

8

Not Used 3/6/98 PWA

1115 Installed ISG-9 in grassy area between property boundary fence (west) and western perimeter road. Location is 18 FT from N corner of rectangular storm drain junction box on 350° azimuth. Air is still. Temperature increasing.

1130 Installed ISG-17, 50 FT from well PZ-5 on 345° azimuth. Ground is mostly bare with spotty grass and sloped down to drainage south of AIP.
Air temp 70°F.

1145 ISG-13 installed 187°, 20 FT from well PZ-4 in large grassy field.

1200 ISG-14 installed 55 FT from SW corner of chain link fence surrounding metal bldg that I will identify back at the car. Area is grassy and gently sloped. Large drainage incision (to 10' deep) ~ 40 ft west of ISG-14. Azimuth from fence corner is 110°.
Property is Allied Partners?

1215 ISG-18, 145° from SE corner of same chain link fence as above. Forgot tape measure but foot paced at 60 FT. Will verify later.

1225 ISG-12, 38 FT from Center of personnel door located midway along north side of Politex maintenance building on 310°. Located within tire tracks that are probably from RUST DPT rig. Grassy field.

PWA 3/6/98

Not Used 3/6/94 PWA

1250
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1440
1505
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153
15

1240 ISG-10 installed 125 FT from center of 36" diameter electrical access vault on 27°. West of Politex ~ 100 FT in grass field on west side of chain link fence.

1250 Break for lunch

1350 Back on site. Verified distance at ISG-18 at 69.7 FT.

1405 At ISG-16. Location is 157°, 98 FT from SE corner of chain link fence surrounding communications tower. Grassy field is wet with some standing water. Weather conditions now are overcast, still, and 70° F.

1415 At Georgia Hydrate. Moved ISG-3 to correspond with ISL-35 which was more accessible. ISG-3 located. 168°, 80 FT from SW yellow post of Ga Hydrate scale.

1425 ISG-15 installed 30 FT from NE corner of drainage headwall on 38° azimuth. Both ISG-3 and ISG-15 installed in grassy, moist areas.

1440 Parked car and walked into landfill to install LSG-s.

1505 Installed LSG-3, 100 FT on 38° from MW-11. In grassy area.

1520 Installed LSG-1, 277°, 13 FT from well MW-3. On mud bar in swamp.

1530 Installed LSG-2, 210°, 11 FT from well MW-10. On sand bar adjacent to flowing water.

1545 Installed LSG-4 at well MW-9.

DWA 3/6/98

A14

Not Used 3/6/98 PWA

272°, 10 FT. Heavily vegetated high ground patch.

1605 Muddy patch of ~~g~~ high ground 10 FT west of well MW-7. Flags on ISG-4 and ISG-5 are reversed. Bruce will fix when he retrieves. This spot is ISG-5.

1630 Out of swamp. Walked back to car, Put on dry Clothes.

1645 Signed out at Politex.

1700 Off-site

End 3/6/98

March 11, 1998
Oversight: Bruce Kristiansen & Jim Furlow
Recovery of Soil Gas Tubes, Allied Ind. Park

0803 Recovered ISG-1 tubes from field near monitoring well.
0820 Recovered ISG-4 tubes from field south of ISG-1
0830 Recovered ISG-9 from grassy area just east of Armstrong / C.of. Ga. RR track.
0841 Recovered ISG-5 from corner of road intersection next to tarpaper pallet storage area
0850 Recovered ISG-6 from grassy area just east of Bldg. 107. VOC container has mud down in bottom. SVOC tube is clean.
0901 Recovered ISG-8 from grass in front (N. side) of Bldg 108.
0914 Recovered ISG-7 from grass on South side of Bldg 108.
0924 Recovered ISG-2 from grassy area on east side of Bldg 106A.
0942 Recovered ISG-11 from grassy area on South side of Bldg. 106 A.
0955 Recovered ISG-16 from area SE of radio transmission tower.
1004 Recovered ISG-15 from area SE of Harris ~~kaolin~~ hydrated lime JWF transfer station.
1012 Recovered ISG-3 from grassy area South of Harris transfer station.
1026 Recovered ISG-18 from field SE of chain link fence.
1035 Recovered ISG-14 from area south of chain link fence.

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J. W. Furlow 3/11/98

March 11, 1998 – Soil Gas Recovery

1055 Recovered ISG-10 from field west of Politex warehouse.

1107 Recovered ISG-12 from field south of Politex plant/warehouse.

1119 Recovered ISG-13 from north side of model aircraft flying field.

1143 Recovered ISG-17 from slope near landfill access road.

1248 Recovered LSG-3 from lower end of landfill area.

1300 Recovered LSG-1 from swamp near MW-3.

1312 Recovered LSG-2 from swamp near MW-10.

1324 Recovered LSG-4 from swamp near MW-9.

1353 Recovered LSG-5 from swamp near Rock Creek, just west of MW-7. Soil gas tubes were under about 6 inches of water when recovered.

1515 All soil gas tubes in shipping container delivered to Federal Express in Macon for shipment to Quadrel Services, Inc. Shipping No. is 3443142403.

J. W. Furlow
3/11/98

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J. W. Farlow 3/12/98

JWF March 12, 1998

Listing of Photos taken:

A. Pio Nono Rd. going south from Masters Inn*:

1. Exxon Station
2. Pio Nono Collision Center
3. RaceTrac service station
4. Minton Lawn Garden
5. A+M Turbo Diesel + Elec.
6. Tall Paul's Campers
7. Pendleys Starter and Alternator Exchange
8. Raffield Tire Master
9. Macon Feed & Seed
10. Houston Auto Auction
11. Metrac Inc.
12. Conoco Service station
13. Amoco service station at Magnolia Court

B. JWF ~~JF~~ Broadway going north from Pio Nono:

14. Tomlin Starter, Alternator and Battery Service
15. Yancey Bros. Co.
16. Armstrong Industrial World
17. Fina Service station
18. Purina Mills

C. Houston Ave. going south from Guy Paine Rd.

19. Purser Truck Sales
20. Auto Tech of Macon
21. Pepsi-Cola of Macon
22. Federal Express

D. Guy Paine Rd going east from Broadway

23. Armstrong Industrial World
24. Hertz Equipment Rental
25. Stephens Oil Co.

* See Plat Maps for locations

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J. W. Furlow 3/12/98

March 12, 1998

26. A.C. White / United Van Lines
27. Macon Apparel Corp.

Camera #2:

A. Allied Industrial Park
1. Schuller
2. Blair Moving and Storage
3. Politex
4. PB&S Chemical
5. General Industrial Polymers
6. Macon Water Authority – Rocky Creek Wastewater Treatment Facility
7. Riverwood International
8. Tenn. Littrell – Georgia Hydrate

B. Mead Rd, going north from Guy Paine Rd
9. General Chemical
10. Georgia Army National Guard Maintenance Shop
11. Keebler

C. ~~12.~~ Guy Paine Rd, going west from Mead
12. Alleghany Rubber, Inc.
13. Georgia Fence Wholesale, Inc.

J. W. Farlow
3/12/98

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J. W. Farlow 3/16/98

March 16, 1998

1115 Met up with Phil Albenesius at Allied Industrial Park. Went to Admin. Bldg., talked to Tom Yocum about storage space, underground utilities, logistics of project.

1145 Called Georgia Power Co. "Call Before You Dig" service to request underground utility clearance on 10 locations within A.I.P. Given ticket no. 6174411 for reference.

1215 Reviewed maps showing compilation of industries around A.I.P. Bruce Kristiansen on site.

1415 Called Georgia Power Co. "Call Before You Dig" service again (phone # 1-800-282-7411) to give them my pager number. Given new ticket number of 6175149.

1620 Alliance Env. crew arrives at A.I.P. with drill rig, support truck and trailer of drums.

1630 Begin setting up decon pad on vacant lot.

1740 J. Furlow, P. Albenesius, B. Kristiansen off site for the day. Drill crew still setting up.

J. W. Furlow 3/16/98

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J. W. Furlow 3/17/83

March 17, 1998 Weather: cool, cloudy
Technical Oversight: Jim Furlow, Bruce Kristiansen
Drilling subcontractor: Alliance Environmental
Driller: Marty Proctor; Helpers: Ben Grim, Gerry McCain
Work Location: CH-4 (between Buildings 106 & 107)

0700 J. Furlow at decon area. Some of drill crew on site.
0730 All crew members on site.
0739 Crew begins deconning equipment
0810 Crew still deconning tools. PID calibrated.
0845 Drill rig and all drilling tools deconned. Moving drill rig to core hole CH-4 location.
0850 Hand augering CH-4 location to depth of 5 feet.
0905 CH-4 location hand augered to depth of 5 feet. Moving drill rig onto CH-4 site.
1000 Drill ~~rr~~ JWF rig set up, ready to go on CH-4.
1010 J. Furlow conducts Pre-Drilling Site Safety and Health orientation at CH-4 for all site personnel.
1048 Begin core drilling on CH-4. Drill bit and core barrel length is 12 feet. Drill rod lengths are all 10 feet. Lengths of all checked with tape measure.
1250 Break for lunch
1345 Coring resumed.
1350 Georgia Power Co representative on site to check out 9 remaining core hole locations. Bruce Kristiansen taking Ga. Power rep. around to other locations.
1500 PID not working; called rental company, they will send one out this afternoon
1655 Coring ended for day on CH-4. Cored depth 76'.
1724 Drill crew off site for day.
1738 J. Furlow and B. Kristiansen off site for day. J. W. Furlow 3/17/98

March 18, 1998 Weather: Cool, cloudy

Technical Oversight: Jim Furlow, Bruce Kristiansen

Drilling subcontractor: Alliance Environmental

Driller: Marty Proctor; Helpers: Gerry McCain, Ben Grim

Work Location: CH-4

0700 J. Furlow and B. Kristensen on site

0705 Drill crew on site.

0710 J. Furlow conducted tailgate safety meeting for all site personnel

0720 Crew cranks up drill rig to resume coring on CH-4.

0734 Resume coring from 76 feet - Run no. 9.

0753 Cored to 86 feet - Run 9.

0810 Begin Run # 10 from 86'-96'.

0835 Cored to 96' - Run 10.

0902 Begin coring on Run #11 - 96'-106'

0917 Run # 11 cored to 106'

0934 Begin coring on Run # 12 - 106'-116'

0948 Run # 12 cored to 116'

1006 Begin coring on Run # 13 - 116'-126'

1030 Coring stopped due to minor hydraulic leak; crew working to repair leak. Run # 13 cored to 126'.

1035 Bell South representative on site to check out coring locations - Bruce Kristiansen taking him around to other core hole locations.

1112 Begin coring on Run # 14 - 126'-130'

1120 Run # 14 cored to 130'. Coring of CH-4 completed. Drill crew tripping tools out of hole.

1250 Drill crew setting up to grout hole up to ground surface.

1305 Crew running tremie pipe in hole to 110' bls.

1312 Crew mixing grout.

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J. W. Fowler 3/18/98

March 18, 1998

1320 9 sacks of cement, ½ sack of Quick-Gel, 100 gal. of water mixed. Begin pumping grout down tremie pipe.

1332 Second batch of grout mixed: 70 gal. of water, 6 sacks of cement, ½ sack of Quick-Gel. Begin pumping grout down tremie pipe.

1336 Grout recirculated to ground surface. Crew cleaning out pump and lines. Total of 15 sacks (94-16. sacks) of cement pumped.

1345 Crew pulling drill pipe out of hole.

1430 Drill pipe out of hole, demobilizing equipment to decon pad.

1450 Crew deconning drill tools.

1542 Decon completed; moving to CH-1 location.

1555 Drill rig and support truck at CH-1 location.

1600 Drill crew hand augering CH-1 location to depth of 5 feet. No obstructions encountered.

1610 Crew setting up drill rig and support truck on CH-1.

1700 Drill rig set up, ready to go. Drill crew off site for the day. J. Furlow & B. Kristiansen off site for the day.

J.W. Furlow
3/18/98

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J. W. Furlow 3/19/98

March 19, 1998 Weather: Cloudy, cool

Technical Oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Gerry McCain, Ben Grim

Location: CH-1, in NW part of A.I.P.

0700 J. Furlow, B. Kristiansen and drill crew on site.
J. Furlow conducts tailgate safety meeting.
0722 Begin coring on CH-1 location. Cleaning out hole.
0730 Begin core run #1, 5'-15'. P.I.D calibrated.
0816 Core run #1 completed, 5'-15'
0828 Begin core run #2, 15'-25'
0908 Run #2 cored to 25'
0922 Begin core run #3, 25'-35'
0950 Run #3 cored to 35'
1000 Begin core run #4, 35'-45'
1007 Run #4 cored to 45'
1014 Begin core run #5, 45'-55'
1038 Run #5 cored to 55'
1050 Begin core run #6, 55'-65'
1110 Run #6 cored to 65'
1124 Begin core run #7, 65'-75'
1142 Run #7 cored to 75'
1204 Begin core run #8, 75'-85'
1218 Run #8 cored to 85' - crew taking break for lunch.
1300 Crew starting back to work.
1310 Begin core run #9, 85'-95'
1333 Run #9 cored to 95'
1354 Begin core run #10, 95'-105'
1402 Run #10 cored to 105'
1413 Begin core run #11, 105'-115'
1430 Run #11 cored to 115'
1452 ~~Run #~~ JWF Begin core run #12, 115'-123'
1500 Run #12 cored to 123'. Coring of CH-1
location ended at depth of 123' bls.

March 19, 1998

1510 Drill crew preparing to move to CH-2 location. Mixing grout to grout up CH-1. Tremie pipe in hole.

1515 7 sacks of cement, 1/3 sack of Quick-Gel, 60 gal. of water mixed. Pumping first batch of grout.

1525 8 sacks of cement, 1/3 sack of Quick-Gel, 70 gal of water mixed. Pumping second batch of grout.

1530 Good grout return to surface. Crew pulling tremie pipe out of hole.

1535 Crew cleaning out pump, hoses and drill rods.

1640 Moving drill rig and support truck to CH-5 location, after deconning drill tools.

1645 Deconning drill tools.

1700 J. Furlow off site

J. W. Furlow
3/19/98

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J. W. Fuller 3/20/98

March 20, 1998 Weather: Cool, cloudy

Technical Oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Ben Grim, Gerry McCain

Location: CH-5, south of Politex warehouse

0700 J. Furlow, B. Kristiansen, drill crew on site.

0715 Moving drill rig and support truck to CH-5 location behind Politex warehouse.

0725 J. Furlow conducts tailgate safety meeting.

0730 Crew begins setting up rig on CH-5.

0745 P.I.D. calibrated.

0811 Begin coring on CH-5 - cleaning hole out to 5'.

0817 Begin core run # 1 - 5'-15'

0854 Run #1 cored to 15'

0908 Begin core run # 2 - 15'-25'

0934 Run # 2 cored to 25'

0945 Begin core run # 3, 25'-35'

0957 Run # 3 cored to 35'

1005 Begin run # 4, 35'-45'

1019 Run # 4 cored to 45'

1030 Begin run # 5, 45'-55'

1046 Run # 5 cored to 55'

1056 Begin run # 6, 55'-65'

1115 Run # 6 cored to 65'

1130 Begin run # 7, 65'-75'

1146 Run # 7 cored to 75'

1207 Break for lunch

1312 Begin core run # 8, 75'-85'

1328 Run # 8 cored to 85'

1338 Begin run # 9, 85'-95'

1348 Run # 9 cored to 95'

1404 Begin run # 10, 95'-100'

1409 Run # 10 cored to 100'

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J. W. Fowler 3/20/98

March 20, 1998

1424 Begin run #11, 100'–107'

1430 Core run #11 drilled to 107'. T.D. of hole is 107'. Alan Shirey of Corps of Engineers on site.

1500 Drill crew running tremie pipe in hole, preparing to grout hole up to ground surface.

1516 Crew mixes 5 sacks of cement, 50 gal. of water, 1/3 sack of bentonite. Pumping grout.

1518 Grout pumped. Mixing second batch of grout.

1522 Second batch of grout mixed: 5 sacks of cement, 50 gal. of water, 1/3 sack of bentonite.

1523 Pumping second batch of grout. Good grout return to ground surface.

1525 Crew pulling tremie pipe and outer casing from hole.

1550 All drill pipe out of hole. Crew pumping grout to fill hole up to ground surface.

1600 Alan Shirey off site. Drill crew preparing to move, going to decon pad.

1620 J. Furlow off site to Federal Express office.

J. W. Furlow
3/20/98

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J. W. Furlow 3/21/98

March 21, 1998 Weather: Cloudy, cold

Technical Oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Gerry McCain, Ben Grim

Location: CH-2, just east of 102 Admin. Bldg.

0700 J. Furlow, B. Kristiansen, drill crew all at decon pad. Crew refueling rig, taking on water.

0725 Moving rig and support truck to CH-2 location.

0730 J. Furlow conducts tailgate safety meeting.

0735 Hand augering CH-2 location.

0748 P.I.D. calibrated.

0800 CH-2 location hand augered to depth of 5 feet; no obstructions. Crew begins setting up drill rig.

0830 Unable to get drill rig onto original CH-2 location due to slope of ground and soft soil conditions. Drill rig became stuck immediately after leaving concrete roadway. Moving to new location on top of hill southeast of 102 Admin. Bldg.

0834 Hand augering new location

0854 New CH-2 location hand augered to depth of 5 feet, no obstructions. Moving drill rig onto location.

0900 Drill rig on location, setting up to drill.

0920 Crew working on hydraulic system to repair leak.

1000 Begin coring on CH-2 location. Cleaning out hand-augered hole.

1008 Begin core run # 1, 5'-15'

1052 Core run #1 drilled to 15'

1101 Begin core run # 2, 15'-25'

1128 Run # 2 cored to 25'

1134 Begin core run # 3, 25'-35'

1148 Run #3 cored to 35'

1152 Begin run # 14, 35'-45'

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J. W. Furlow 3/21/98

March 21, 1998

1200 Run # 4 cored to 45'

1220 Break for lunch

1314 Resume coring, run # 5, 45'-55'

1322 Run # 5 cored to 55'

1331 Begin run # 6, 55'-65'

1340 Run # 6 cored to 65'

1348 Begin run # 7, 65'-75'

1359 Run # 7 cored to 75'

1412 Begin run # 8, 75'-85'

1434 Run # 8 cored to 85'

1445 Begin run # 9, 85'-95'

1500 Run # 9 cored to 95'

1518 Begin run # 10, 95'-105'

1530 Run # 10 cored to 105'

1556 Begin run # 11, 105'-115'

1605 Run # 11 cored to 125'

1624 Begin run # 12, 115'-125'

1637 Run # 12 cored to 125'

1650 Core drilling ended for day at depth of 125' bls.

1700 J. Furlow, B. Kristiansen and drill crew off site for the day.

J. W. Furlow
3/21/98

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J. W. Furlow 3/22/98

March 22, 1998 Weather: cloudy, cold

Technical Oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Ben Grim, Gerry McCain

Location: CH-2

0700 J. Furlow, B. Kristiansen, drill crew on site at CH-2 location. J. Furlow conducts tailgate safety meeting.

0710 P.I.D. calibrated. Drill crew servicing rig.

0723 Tripping in to resume coring CH-2

0732 Begin core run #13, 125'-135'

0754 Run #13 cored to 135'

0815 Drill rig engine running rough and cutting off; crew shuts down to find problem.

0940 Drill rig engine running again; tripping in for core run #14.

0948 Begin core run #14, 135'-145'

1012 Run #14 cored to 145'

1028 Begin core run #15, 145'-155'

1040 Run #15 cored to 155'. T.D. of boring. Crew tripping out drill rods.

1050 Crew running tremie pipe in hole, preparing to grout hole up to ground surface.

1057 Mixing first batch of grout: 7 sacks of cement, 1/3 sack of Quick-Gel, 60 gal. of water.

1101 Pumping first batch of grout down tremie pipe.

1105 First batch of grout pumped.

1111 Second batch of grout mixed: 8 sacks of cement, 1/3 sack of Quick Gel, 70 gal. of water.

1112 pumping second batch of grout.

1115 Good recirculation of grout to ground surface.

1120 Crew tripping outer casing out of hole, cleaning grout out of lines.

1153 Crew mixing small batch of grout to top off hole.

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J. W. Fowler 3/22/98

March 22, 1998

1158 3- sack batch of grout mixed and pumped into hole. Crew cleaning equipment.

1210 Break for lunch.

1300 Crew moving drill rig to decon pad.

1320 Crew picking up full drums from previous drill sites, moving them to staging / decon area.

1617 All drums moved to drum staging area and labeled. Drill tools deconned, ready to go.

1618 Drill crew off site. J. Furlow, B. Kristiansen off site.

J. W. Furlow
3/22/98

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J. W. Fulton 3/23/98

March 23, 1998 Weather: Clear, cool

Technical Oversight: Jim Furlow, Bruce Kristianson

Driller: Marty Proctor; Helpers: Ben Grim, Gerry Mccain

Location: CH-3, CH-6

0700 J. Furlow, drill crew at decon pad, preparing to move on to CH-3 location in South Macon Park.

0720 Moving to CH-3 site.

0725 J. Furlow conducts tailgate safety meeting.

0730 Begin setting up rig and support truck on CH-3.

0756 P.I.D. calibrated.

0810 Hand augering to depth of 5 feet - no obstructions encountered.

0830 Begin Core run #1 - 5'-15'

0842 Run #1 cored to 15'

0847 Begin run #2, 15'-25'

0859 Run #2 cored to 25'

0901 Begin run #3, 25'-35'

0908 Run #3 cored to 35'

0930 Begin run #4, 35'-45'

0938 Run #4 cored to 45'

0946 Begin run #5, 45'-55'

0958 Run #5 cored to 55'

1006 Begin run #6, 55'-65'

1015 Run #6 cored to 65'

1025 Begin run #7, 65'-75'

1034 Run #7 cored to 75'

1104 Begin run #8, 75'-85'

1120 Run #8 cored to 85'

1132 Begin run #9, 85'-95'

1140 Run #9 Cored to 95'. T.D. of Boring.

1800 Break for lunch.

1220 Drill crew runs tremie pipe in hole, preparing to grout.

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J. a. Furlow 3/23/98

March 23, 1998

1233 First batch of grout mixed: 7 sacks of cement, 60 gal. of water, 1/3 sack of Quick-Gel.

1235 First batch of grout pumped down tremie pipe.

1247 Tremie pipe out of hole. Pulling outer drill pipe from hole.

1304 Drill pipe out of hole, tremie pipe back in hole. Crew mixing second batch of grout: 2 sacks of cement, 18 gal. of water, 3 lb. Quick-Gel.

1307 Second batch of grout pumped. Good recirculation of grout to ground surface.

1310 Crew cleaning out hoses and pump.

1320 Crew moving rig, closing drums, cleaning site.

1335 Drill rig and support truck demobilized off CH-3 location.

1342 Drill rig and support truck at decon pad, crew preparing to decon drill tools.

1415 Crew brings full drums over from CH-3 site, stores them in drum storage area.

1505 Drill crew setting up rig and support truck on CH-6 location. Hand augering to depth of 5 feet.

1520 Drill rig and support truck on CH-6 location. Preparing to core.

1552 Begin coring on CH-~~3~~ 6 JWF. Cleaning out hole 0'-5'

1553 Begin core run #1, 5'-15'

1615 Run #1 cored to 15'

1623 Begin core run #2, 15'-25'

1635 Run #2 cored to 25'

1640 Begin core run #3, 25'-35'

1651 Run #3 cored to 35'. End of coring for day.

1700 All personnel off site for the day.

JW Fowler 3/23/98

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J. W. Fowler 3/24/58

March 24, 1998 Weather: cool, cloudy

Technical oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Ben Grim, Gerry McCain

Location: CH-6, in SE area of A.I.P.; CH-7

0702 J. Furlow, B. Kristiansen on site at CH-6.

0708 Drill crew on site

0710 J. Furlow conducts tailgate safety meeting

0719 P.I.D. calibrated

0733 Begin core run #4, 35'-45'

0749 Run #4 cored to 45'

0755 Begin core run #5, 45'-55'

0805 Run #5 cored to 55'

0814 Begin core run #6, 55'-65'

0830 Run #6 cored to 65'

0837 Begin core run #7, 65'-75'

0848 Run #7 cored to 75'

0855 Work stopped due to rain.

0907 Work resumed; rain stopped

0912 Begin core run #8, 75'-85'

0924 Run #8 cored to 85'

0936 Begin core run #9, 85'-93'

0950 Run #9 cored to 93' T.D. of boring is 93' bls.

0955 Crew preparing to grout up boring. Tremie pipe in hole.

1009 First batch of grout mixed: 7 sacks of cement, 1/4 sack of Quick-Gel, 70 gal. of water

1010 Pumping first batch of grout

1014 First batch pumped. ~~Mixing second batch of grout~~ JWF. Crew pulling outer drill pipe from hole.

1030 Crew cleaning grout out of pump and hoses, preparing to move.

1105 Drill rig and support truck off site to decon pad.

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J. W. Furlow 3/24/93

March 24, 1998

1230 Drill rig on site at CH-7 location.
Rig stuck in soft ground where location
was originally staked.
1300 Unable to pull drill rig out with support
truck. John Rader has gone to get a wrecker.
1350 Wrecker on site.
1424 Drill rig unstuck. Moving to new location
about 100 feet southeast of original location.
1430 Hand augering new location to depth of 5 feet.
1440 CH-7 location hand augered to depth of 5 feet,
no obstructions encountered.
1510 Begin coring on CH-7
1512 Begin core run #1, 5'-15'
1529 Run #1 cored to 15'
1534 Begin core run #2, 15'-25'
1542 Run # 2 cored to 25'
1548 Begin run # 3, 25'-35'
1556 Run # 3 cored to 35'
1605 Begin core run #4, 35'-45'
1618 Run # 4 cored to 45'
1627 Begin core run #5, 45'-55'
1650 Run # 5 cored to 49' because of hard
material (siltstone) encountered in hole.
1700 Work on CH-7 ended for the day
1718 J. Furlow and B. Kristiansen off site
for the day. Drill crew servicing the rig.

J. W. Furlow
3/24/98

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J.W. Fulton 3/25/91

March 25, 1998 Weather: Clear, cool

Technical oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Ben Grim, Gerry McCain

Location: CH-7, CH-10

0702: J. Furlow & B. Kristiansen on site at CH-7

0710 Drill crew on site. Begin servicing rig

0720 J. Furlow conducts tailgate Health & Safety meeting.

0729 P.I.D. calibrated. Crew preparing to resume coring from depth of 49' bls.

0740 Crew tripping drill tools in hole to resume coring.

0755 Resume coring run # 5 from 49'

0810 Run # 5 cored to 55'

0820 Begin core run # 6, 55'-65'

0836 Run # 6 cored to 65'

0844 Begin core run # 7, 65'-75'

0858 Run # 7 cored to 75'

0910 Begin core run # 8, 75'-80'

0920 Run # 8 cored to 80'

0933 Begin core run # 9, 80'-87'

0940 Run # 9 cored to 87'. T.D. of boring is 87'

0945 Tremie pipe in hole. Crew preparing to grout up boring to ground surface.

0955 First batch of grout mixed: 6 sacks of cement, 1/4 sack of Quick-Gel, 70 gal. of water. Begin pumping first batch of grout.

0958 First batch pumped. Good recirculation of grout to ground surface. Crew pulling tremie pipe.

1005 Tripping outer casing out of hole.

1115 Drill rig and support truck off site at CH-7. Going to decon pad to decon tools.

1157 Drill tools deconed. Moving to CH-10

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J. W. Furlow 3/25/98

March 25, 1998

1220 CH-10 location hand augered to depth of 5 feet; no obstructions encountered. Crew setting up to drill.

1306 Coring 0'-5' to clean out hole.

1311 Begin core run #1 on CH-10, 5'-15'

1319 Run #1 cored to 15'

1324 Begin core run #2, 15'-25'

1330 Run #2 cored to 25'

1335 Begin core run #3, 25'-35'

1356 Core run #3 drilled to 35'

1423 Begin core run #4, 35'-45'

1430 Run #4 cored to 45'

JWF 1438 Begin core run #5, 45'-55'

1450 Run #5 cored to 55'

1455 Begin core run #6, 55'-65'

1511 Run #6 cored to 65'. Total depth of hole: 65'.

1530 Crew mixing first batch of grout: 6 sacks of cement, 70 gal. water, 1/4 sack of Quick-Gel.

1535 First batch mixed. Pumping grout down tremie pipe.

1538 Good recirculation of grout to ground surface. Pulling tremie pipe out of hole.

1545 Pulling outer casing from hole.

1630 All equipment packed up, ready to demobilize off CH-10 location.

1635 Drill rig and support truck at decon pad.

1645 J. Furlow off site.

J. W. Furlow
3/25/98

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J. W. Furlow 3/26/98

March 26, 1998 Weather: Clear, cool

Technical Oversight: Jim Furlow, Bruce Kristiansen

Driller: Marty Proctor; Helpers: Ben Grim, Gerry McCain

0702 J. Furlow, B. Kristiansen, drill crew all at decon pad.

0705 J. Furlow conducts tailgate safety meeting

0720 Drill crew cordoning off drums, preparing to finish up remaining work before demobilizing to Ohio.

0730 J. Furlow off site to Bibb Co. Courthouse for maps.

0930 J. Furlow back on site; drill crew has topped off all boreholes. Depths to grout were as follows:

Hole #	Depth to grout
CH-3	15'
CH-7	20'
CH-4	1'
CH-2	25'
CH-1	3'
CH-6	7'
CH-10	4'
CH-5	5'

A total of 15 sacks of cement were used to top off the above holes. Drill crew now packing up all tools and equipment, preparing to demobilize.

Total number of drums used: 88 (16 for soil, 72 for drilling fluid).

Total number of core boxes used: 82

1105 Drill crew off site, demobilizing to Ohio.

1115 Bruce Kristiansen off site.

1120 J. Furlow off site. J. W. Furlow 3/26/98

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J. W. Furlow 4/15/98

April 15, 1998 Weather: Cloudy, warm

Technical Oversight: Jim Furlow

CPT Contractor: Fugro

CPT Operator: Ed Escoclea; Helpers: Jeff Cahn, Mark Decker

1115 Conducted Pre-Entry Health & Safety orientation for field personnel.

1130 Gathering equipment, calibrating equipment, determining sampling program.

1230 Deconning stainless steel bailers.

1400 Fugro crew has hand augered to depth of 5 feet at locations IGW-68, 69 and 73.

1545 Mobilizing Fugro CPT rig to IGW-69 location.

1552 Fugro crew setting up on IGW-69.

1605 Begin pushing to depth of 43' on IGW-69.

1613 Tool pushed to 43' depth. Opening sampling tool.

1614 Begin collecting groundwater sample from 43'.

1650 Field parameters of sample IGW-69 measured and recorded.

1703 Groundwater sample IGW-69 collected from depth of 43'. Fugro crew preparing to grout up boring.

1809 J. Furlow off site for day.

J. W. Furlow
4/15/98

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J.W. Fowler 4/16/98

April 16, 1998 Weather: Warm, cloudy

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Ed Escochea; Helpers: Jeff Cahn,
Mark Decker

0720 J. Furlow at SAIC field office

0730 Calibrating PID and Horiba U-10

0755 Moving CPT rig to IGW-68 location

0805 Setting up on IGW-68, just south of baseball field fence.

0815 CPT rig set up on IGW-68. Tailgate Health & Safety meeting conducted.

0818 Begin pushing to depth of 55' bgs on IGW-68.

0835 Groundwater sampling tool pushed to depth of 55'. Beginning to sample.

0850 No water at 55'. Pulling sampling tool out to go back in to depth of 65'.

0905 Begin pushing with clean sampling tool.

0913 Tool pushed to depth of 65' bgs.

0915 Begin groundwater sampling at depth of 65'.

0928 Groundwater sample collected from depth of 65' at IGW-68. Fugro crew preparing to grout up boring and move to next location.

0940 Sample IGW-68-01 delivered to Bruce Kristiansen at SAIC field office

1035 Moving to location IGW-73

1057 Set up on location IGW-73.

1102 Begin pushing to depth of 20' bgs.

1106 Sampling tool pushed to depth of 20'.

1113 No water at depth of 20'.

1122 Clean sampling tool put on push rods. Begin pushing to depth of 32' bgs.

1128 Sampling tool pushed to depth of 32'.

April 16, 1998

1147 Groundwater sample IGW-73-01 collected. Also collected VOC samples for GEL analysis. Sample depth 32' bgs.

1208 Samples IGW-73-01 relinquished to Bruce Kristiansen. Fugro crew deconning equipment.

1330 CPT rig set up on IGW-72 location.

1350 Push rods hit something hard at depth of 13 feet. Pulling out to move forward (south) 10 feet.

1410 New location hand augered to depth of 5 feet. Beginning push on IGW-72-01

1415 Sampling tool hits refusal at 13' bgs. Pulling out to move.

1440 Moved 50' west. Begin pushing sampling tool at new location after hand augering 5'.

1450 Hit something hard (refusal) at depth of 11 feet. Pulling out to move again.

1511 Begin pushing sampling tool at new location.

1515 Sampling tool hit refusal at 14½' bgs. Moving to new location for IGW-72.

1542 Moved to new location, begin pushing sampling tool.

1602 Sampling tool pushed to depth of 58 feet. Opening tool up to sample.

1635 All samples collected from IGW-72-01: Field VOCs, GEL VOCs, GEL Duplicate, USACE Split.

1645 Begin packing samples for shipment to GEL and USACE lab in Marietta Ga. Going to GEL: IGW-73-01 (VOCs); IGW-72-01 (VOCs); IGW-72-01-A (VOC duplicate); trip blank.

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J. W. Furlow 4/16/98

April 16, 1998

Going to USACE lab in Marietta:

IGW-72-01-D (VOC split); trip blank.

1745 All samples iced, packed, shipped by Fed Ex Next Day Priority.

J.W. Furlow
4/16/98

J.W. Furlow
4/16/98

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J.W. Furlow 4/17/98

April 17, 1998 Weather: warm, cloudy

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Ed Escochea; Helpers: Jeff Cahn, Mark Dexter

0720 J. Furlow at Field Office; Bruce Kristiansen having problems recalling data on GC computer.

0800 Photovac HL-200 and Horiba U-10 calibrated.

0930 Four additional locations staked to be hand augered. Problem with computer software still unresolved.

1006 Phil Albenesius says not to take any more samples until software problem can be resolved. He will call back soon.

1142 At direction of P. Albenesius, all personnel off site until next Tuesday.

J. W. Furlow 4/17/98

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J. W. Furlow 4/21/98

April 21, 1998

Bruce Kristiansen and Jim Furlow at SAIC Field office. Bruce K. trying to get computer program for GC up and running. Alan Volesky from Augusta office of SAIC arrives at 1045 AM to help Bruce.

After much working with the computer and GC, Alan V. and Bruce K. concluded that they can run samples now and get usable results. Phil Alberesius said to contact Fugro and have them come on down.

Contacted Fugro at 1730; they will mobilize down from Atlanta tomorrow morning.

J. W. Furlow
4/21/98

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J.W. Furlow 4/22/98

April 22, 1998 Weather: Clear, cool

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Ed Escocea; Helpers: Jeff Cahn, Mark Bender

0720 J. Furlow at SAIC field office. Bruce Kristiansen doing GC calibrations.

0800 Horiba U-10 and Photovac HL-200 calibrated.

0815 J. Furlow off to Home Depot/Wal-Mart to get field supplies.

0830 J. Furlow putting out stakes for direct push groundwater sampling locations.

1110 Fugro crew all on site; preparing to begin sampling.

1202 Fugro rig at IGW-80 location; setting up to push and sample groundwater

1208 Begin pushing to depth of 30' at IGW-80 location.

1218 Sampling tool pushed to depth of 30' bls, opened up to sample groundwater.

1227 Sample IGW-80-01 taken at depth of 30' bls.

1240 Sample IGW-80-01 delivered to field office/lab, relinquished to Bruce Kristiansen.

1300 Fugro rig stuck at IGW-80. Crew working to get rig out.

1314 Rig unstuck. Preparing to move.

1320 CPT rig at IGW-81 location.

1330 Rig ~~set~~ up on IGW-81. Begin pushing to depth of 21' bls.

1337 Sampling tool pushed to 21' and opened up for sampling.

1341 Sampling tool dry. No water at 21';

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J. W. Farlow 4/22/98

April 22, 1998

pulling rods out to go to depth of 26' bls.

1350 Sampling tool pushed back in to depth of 26'.

1352 Begin sampling at IGW-81 at depth of 26' bls.

1358 Groundwater sample IGW-81-01 collected at depth of 26'.

1408 Groundwater sample ~~IGW-81-01~~ JWF 4/22/98 IGW-81-01 delivered to field lab.

1430 Fugro moved to IGW-92. Set up and begin to push.

1435 Refusal at 13' bls at IGW-92. Moving to new location for IGW-92. Hand augering new location before pushing.

1450 Location hand augered to depth of 5', no obstructions.

1505 Begin pushing to depth of 26' at IGW-92 new location.

1517 Sampling tool pushed to depth of 26' at IGW-92 location.

1521 Begin sampling IGW-92

1530 Groundwater sample IGW-92-01 collected from depth of 26' at IGW-92.

1542 Groundwater sample IGW-92-01 relinquished to B. Kristiansen at field lab.

1605 Fugro rig set up on IGW-96, pushed sampling tool to depth of 20' bls. Begin sampling.

1610 Groundwater sample IGW-96-01 collected from depth of 20 feet at IGW-96.

1624 Groundwater sample IGW-96-01 relinquished to B. Kristiansen at field lab.

1730 All borings grouted up. Fugro off site for day. B. Kristiansen off site for day.

1745 J. Furlow off site for the day.

J.W. Furlow 4/22/98

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J. W. Furlow 4/23/98

April 23, 1998 Weather: Clear, cool

Technical Oversight: Jim Furlow

CPT Contractor: Fugro

CPT Operator: Ed Escochea; Helpers: Mark Bender, Jeff Cohn

0715 J. Furlow at SAIC field office. B. Kristiansen calibrating GC.

0730 Photovac HL-200 and Horiba U-10 calibrated. Fugro warming up CPT rig.

0740 Took rinsate blank on bailer to be used at IGW-67.

0755 J. Furlow conducts tailgate safety meeting for all field personnel.

0805 CPT rig at IGW-67 location. Hand augering down.

0815 Hand auger hit concrete 3 feet down. Hand augering another location.

0930 Location IGW-67 hand augered to depth of 5 feet after 6 tries.

0933 Begin pushing to depth of 55 at IGW-67.

0955 Pushed to depth of 55'.

1005 Groundwater sample IGW-67-01 collected from depth of 55'.

1020 Sample IGW-67-01 relinquished to B. Kristiansen at field lab. (1 unp., 2 pres. 40ml.)

1025 Begin pushing to 100 feet at IGW-67 location.

1110 Pushing gets very hard at 80' bls. Very slow going.

1120 Begins pushing much easier at about 90'.

1123 Sampling tool pushed to 100' at IGW-67-02.

1157 Groundwater sample IGW-67-02

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J W Fulton 12/23/92

April 23, 1998
back 2 feet because no water came in at 100 feet.
Samples are 1 40 ml unpreserved vial, 2 40-ml.
preserved vials.
1210 Sample IGW-67-02 relinquished
to B. Kristiansen at field lab. Fugro crew
moving rig to IGW-79 location.
1333 Begin pushing to depth of 45' at
IGW-79.
1402 Sampling tool pushed to depth of 45'
at IGW-79 location.
1406 Begin sampling IGW-79-01.
1408 No water in sampling tool at 45'.
Pulling tools out to push to depth of 55'.
1442 Sampling tool pushed to depth of 55'
at IGW-79-01. Good water in tool.
Begin sampling.
1450 Sample IGW-79-01 collected from
depth of 55'.
1500 Sample IGW-79-01 relinquished
to B. Kristiansen at field lab.
1510 CPT rig pushing to depth of 85'
for sample # IGW-79-02
1534 Sampling tool pushed to depth of 85' bls,
but last foot or so was very hard (to refusal).
Pulling sampling tool back to 83' to attempt
to sample.
1540 No water at 83'. Pulling back to 80'.
1552 No water at 80'. Pulling out to push
deeper than 85'.
1610 P. Albenesius says to not try again to
obtain deeper sample at IGW-79. Sample
IGW-79-02 not collected.
1620 Fugro crew grouting up holes.

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J. W. Furlow 4/23/98

April 23, 1998

1714 B. Kristiansen off site for the day.

J. Furlow deconning stainless steel bailers

1730 J. Furlow off site for the day.

J. W. Furlow 4/23/98

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J. W. Fowler

April 24, 1998 Weather: Clear, cool

Technical Oversight: Jim Furlow

Subcontractor: Fugro

CPT Operator: Ed Escodea; Helpers: Mark Bender,

Jeff Cahn

0720 J. Furlow at SAIC to calibrate instruments.

0740 J. Furlow conducts tailgate safety meeting for field personnel.

0755 Fugro rig mobilized to location IGW-77 to begin sampling.

0804 Begin pushing to depth of 55' at IGW-77.

0835 Pushed to 55' at IGW-77. Begin sampling.

0846 Groundwater sample IGW-77-01 obtained: 1 40 ml vial for field screen, 2 40 ml preserved vials for GEL analysis.

0900 Sample IGW-77-01 relinquished to B. Kristiansen at field lab.

0910 Fugro pushing to depth of 90' at IGW-77.

0925 Refusal of sampling tool at 69' bls.

0935 Pulling tool out to move to IGW-78. No IGW-77-02 sample taken.

1005 Fugro rig set up on IGW-78 location. Begin pushing to depth of 52'. Hit refusal at 7.5'. Moving forward to try again.

1036 Refusal at 9.5'; moving to try again.

1102 Refusal at 9.5'; moving to try again.

1145 Refusal at 9.5'; moving to IGW-97 location per instructions from Phil Albenesius. No sample obtained at IGW-78 location.

1259 Begin pushing to depth of 30' at IGW-97 location.

1312 Refusal at depth of 20' at IGW-97. Rods broke off while attempting to push through

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J. W. Furlow 4/24/98

April 24, 1998

very hard materials starting at depth of 16'.

1320 Fugro crew attempting to recover rods in ground when broken off.

1335 Moving to IGW-85 location. No sample obtained at IGW-97 location.

1345 Begin pushing to depth of 50' at IGW-85 location.

1422 Sampling tool pushed to depth of 50' at IGW-85 location. No problems pushing.

1425 Begin sampling at IGW-85, depth 50'

1432 Sample IGW-85-01 collected from depth of 50'.

1443 Sample IGW-85-01 relinquished to B. Kristiansen at Field lab.

1500 Groundwater samples IGW-67-01 (2 40ml vials), IGW-67-02 (2 40ml vials), IGW-77-01 (2 40ml vials), and two trip blanks, one temperature blank packed in cooler with ice to be shipped to GEL

1510 Sample cooler delivered to Federal Express for Saturday delivery (Reference Fed Ex airbill 803577868770)

1550 All holes grouted up. Fugro off site for the weekend.

1630 J. Furlow and B. Kristiansen off site for the weekend.

J.W. Furlow
4/24/98

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JW Fowler 4/27/98

April 27, 1998 Weather: Clear, warm

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Ed Escochea; Helpers: Jeff Cahn, Mark Decker

0715 J. Furlow at SAIC field office/lab. Bruce Kristiansen calibrating GC.

0730 Photovac HL-200 and Horiba U-10 calibrated.

0740 All Fugro personnel on site. Conducting daily tailgate safety meeting.

0750 Mobilizing CPT rig to IGW-86 location.

0815 CPT rig set up on IGW-86.

0820 Begin pushing to depth of 50' at IGW-86.

0845 Sampling tool pushed to depth of 50'. Begin groundwater sampling at IGW-86.

0855 Groundwater sample IGW-86-01 collected at depth of 50'.

0905 Groundwater sample IGW-86-01 relinquished to B. Kristiansen at SAIC field lab.

0930 Sampling tool pushed to depth of 80 feet at location IGW-86-02.

0934 Begin sampling at IGW-86-02.

0940 Groundwater sample IGW-86-02 collected from depth of 80'.

0950 Groundwater sample IGW-86-02 relinquished to B. Kristiansen at field lab.

1030 Fugro CPT rig set up on IGW-91 location. Begin pushing to 45' depth.

1040 Sampling tool pushed to depth of 45'.

1042 Begin sampling IGW-91-01 at

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J. W. Jaslow 4/27/98

April 27, 1998

1048 Groundwater sample IGW-91-01 collected from depth of 45'.

1055 Groundwater sample IGW-91-01 relinquished to B. Kristiansen at SAIC field lab.

1130 Fugro rig setup on IGW-90-01, pushed to 30'.

1142 Sampling tool pushed to depth of 50' and opened up; no water. Tripping rods out to push deeper.

1253 Begin pushing to depth of 57' at IGW-90.

1310 Sampling tool pushed to depth of 57'.

1330 Groundwater sample IGW-90-01 collected at depth of 57'.

1338 Groundwater sample IGW-90-01 relinquished to B. Kristiansen at field lab.

1453 Begin pushing to depth of 55' at IGW-100 location.

1520 Sampling tool pushed to depth of 55' at IGW-100 location.

1522 Begin sampling at IGW-100-01.

1528 Groundwater sample IGW-100-01 collected; 1 40 ml vial, 1 1-liter amber bottle (SVOCs).

1603 Groundwater sample IGW-100-01 relinquished to B. Kristiansen.

1705 B. Kristiansen off site for the day.

1710 J. Furlow off site for the day.

J. W. Furlow
4/27/98

April 28, 1998 Weather: cool, cloudy

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Ed Escocha; Helpers: Jeff Cahny

Mark Decker

0725 J. Furlow at field office/lab. B. Kristiansen calibrating GC.

0735 Photovac HL-200 and Horiba U-10 calibrated.

0745 J. Furlow conducts daily tailgate safety meeting for field personnel.

0755 Fugro rig set up on IGW-66 location. Begin pushing sampling tool to depth of 55'.

0815 Sampling tool pushed to depth of 55' at IGW-66 location.

0818 Begin sampling at IGW-66.

0900 Groundwater sample IGW-66-01 collected from depth of 55' – 1 40ml vial, 1 1-liter amber bottle (svocs).

0915 Groundwater sample IGW-66-01 relinquished to B. Kristiansen at field lab.

0950 Moving CPT rig to IGW-99 location.

1015 Begin pushing sampling tool to depth of 45' at IGW-99 location.

1034 Sampling tool pushed to depth of 45'.

1038 Bailer lost down in push rods – nylon cord had a break in the roll. Fugro crew trying to fish bailer out of rods.

1057 Unable to fish bailer out. Pulling rods out of hole.

1115 Sampling tool back on bottom at depth of 45'. Begin sampling.

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J. W. Furlow 4/29/58

April 29, 1998 Weather: cloudy, cool
Technical Oversight: Jim Furlow
CPT Subcontractor: Fugro
CPT operator: Jeff Cahn; Helpers: Mark Decker, Tim Chaney

0720 J. Furlow at SAIC field office/lab.
B. Kristiansen running calibration standards on GC.
0730 Photovac HL-200 and Horiba U-10 calibrated.
0740 J. Furlow conducts daily Health & Safety briefing for field personnel.
0800 Went to Politex, got permission from Richard Shaw to do sampling on Politex property
0810 Mobilizing Fugro rig to IGW-76 location.
0838 Begin pushing to depth of 45' at IGW-76.
0856 Sampling tool pushed to depth of 45' at IGW-76.
0859 Begin sampling at 45'.
0910 Groundwater sample IGW-76-01 collected from depth of 45' (1 40 ml vial, 2 40-ml vials, preserved).
0918 Groundwater sample IGW-76-01 relinquished to B. Kristiansen at field lab.
0925 Fugro begins pushing to depth of 90' at IGW-76 location.
1000 Unable to push beyond 59' at IGW-76 location. Begin pulling rods out of hole to move to IGW-75.
1030 Begin pushing to depth of 40' at IGW-75.
1049 Sampling tool pushed to depth of 40' at IGW-75.
1055 Begin sampling at 40' in IGW-75-01.
1104 Groundwater sample IGW-75-01 collected from depth of 40'.
1112 Groundwater sample IGW-75-01 relinquished to B. Kristiansen at field lab.

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J. W. Furlow 4/25/98

April 29, 1998

1250 Begin pushing to depth of 85' at IGW-75.
1323 Sampling tool pushed to depth of 85' at IGW-75.
1333 No water at 85'. Pulling rods out to go to depth of 92' at IGW-75.
1350 Begin pushing again to depth of 92'.
1419 Unable to push sampling tool beyond 68'. Pulling rods out of hole. No deep sample collected at IGW-75.
1430 Moving to IGW-84 location.
1450 Begin pushing to depth of 40' at IGW-84.
1505 Sampling tool pushed to 40' at IGW-84.
1510 Begin sampling at 40'.
1516 Groundwater sample IGW-84-01 collected from depth of 40.
1518 Groundwater sample IGW-84-01 relinquished to B. Kristiansen.
1535 Fugro rig moving onto IGW-88 location
1545 Begin pushing sampling tool to depth of 45' at IGW-88 location.
1600 Sampling tool pushed to depth of 45'
1608 Begin sampling at depth of 45' at IGW-88.
1613 Groundwater sample IGW-88-01 collected from depth of 45' at IGW-88 location.
1627 Groundwater sample IGW-88-01 relinquished to B. Kristiansen at field lab.
1650 J. Furlow and B. Kristiansen off site for the day.

J.W. Furlow 4/29/98

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J.W. Furlow 4/30/98

April 30, 1998 Weather: Cool, raining

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Jeff Cahn; Helpers: Mark Decker, Tim Chaney

0720 J. Furlow at SAIC field office

0730 Photovac HL-200 and Horiba U-10 calibrated.

0740 J. Furlow conducts daily tailgate safety meeting for field personnel.

0800 Begin pushing to depth of 85 feet at IGW-88 location (deep aquifer sample).

0827 Sampling tool hits refusal at depth of 62.5' bls; push rod is bent. No deep sample (02) is collected at IGW-88 location.

0845 Mobilizing CPT rig to IGW-74 location.

0902 Begin pushing to depth of 25' at IGW-74.

0912 Sampling tool pushed to depth of 25' at IGW-74.

0915 Begin sampling at 25 feet at IGW-74.

1023 Groundwater samples collected from depth of 25' at IGW-74: 1 40ml vial (field screening) 2 1-liter amber bottles (sample and GEL duplicate), 1 1-liter amber bottle (USACE split).

1039 Groundwater samples IGW-74-01 relinquished to B. Kristiansen at field lab.

1105 Fugro rig mobilized to IGW-89 location.

1110 Begin pushing to depth of 40' at IGW-89.

1130 Sampling tool pushed to 40' at IGW-89. Begin sampling.

1142 VOC samples collected (1 40ml unpreserved, 2 40-ml preserved).

1214 SVOC sample collected from 40' at IGW-89.

1222 Groundwater sample IGW-89-01

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J.W. Furlow 4/30/98

April 30, 1998

relinquished to B. Kristiansen at field lab.

1315 Begin pushing to depth of 83' (02 sample) at IGW-89 location.

1335 Sampling tool hits refusal at depth of 57' at IGW-89. No deep (02) sample collected at IGW-89.

1355 Moving to IGW-98 location.

1405 Fugro rig set up on IGW-98 location.

1410 Begin pushing sampling tool to depth of 50' at IGW-98.

1430 Sampling tool pushed to depth of 50' at IGW-98.

1435 Begin sampling at 50' in IGW-98

1510 Groundwater sample IGW-98-01 collected from depth of 50' (1 40ml vial for field screen, 1 1-liter amber bottle for SVOCs at GEL)

1517 Groundwater sample IGW-98-01 relinquished to B. Kristiansen at field lab.

1556 Fugro rig set up on IGW-64.

1557 Begin pushing to depth of 15' at IGW-64 location.

1604 Sampling tool pushed to depth of 15' at IGW-64.

1610 Sampling tool dry at 15'. Pulling tool out to push to ~~25'~~ JWF 20'.

1621 Sampling tool pushed to depth of 20'.

1626 Begin sampling at depth of 20' at IGW-64.

1638 Groundwater sample IGW-64-01 collected from depth of 20'. (1 40ml vial for field screen)

1652 Groundwater sample IGW-64-01 relinquished to B. Kristiansen at field lab.

1725 J. Furlow and B. Kristiansen off site for day.

J.W. Furlow 4/30/98

May 1, 1998 Weather: Cool, cloudy

Technical Oversight: J.W. Furlow

CPT Subcontractor: Fugro

CPT Operator: Jeff Cahn; Helpers: Mark Decker, Tim Chaney

0725 J. Furlow at SAIC Field lab.

0735 Photovac HL-200 and Horiba U-10 calibrated.

0740 J. Furlow conducts daily safety meeting for field personnel.

0805 Fugro CPT rig setting up on IGW-82 location.

0813 Begin pushing sampling tool to depth of 30' at IGW-82 location.

0823 Sampling tool pushed to depth of 30'.

0825 Begin sampling at 30' at IGW-82.

0841 Groundwater sample IGW-82-01 collected from depth of 30'.

0857 Groundwater sample IGW-82-01 relinquished to B. Kristiansen at Field lab.

0905 Fugro rig stuck in soft ground while trying to mobilize to IGW-83 location.

1106 Fugro rig unstuck

1115 Rig set up on IGW-87 location

1125 Begin pushing to depth of 35' at IGW-87.

1136 Sampling tool pushed to depth of 35' at IGW-87.

1142 Begin sampling.

1151 Groundwater sample IGW-87-01 collected from depth of 35.'

1154 Groundwater sample IGW-87-01 relinquished to B. Kristiansen. Field crew breaking for lunch.

May 1, 1998

1302 Crew back at IGW-87, preparing to move.

1305 Rig stuck in soft ground.

1430 Rig unstuck, moved to firm ground. All remaining sampling locations are in areas where ground is presently too soft to drive Fugro rig. However, if little or no rain occurs over the weekend, access to these locations (IGW-83, IGW-94, and IGW-95) may be possible.

1525 All off site for the day/weekend.

J. W. Furlow 5/1/98

May 5, 1998 Weather: Clear, cool

Technical Oversight: Jim Furlow

CPT Subcontractor: Fugro

CPT Operator: Jeff Cahn; Helper: Tim Chaney

0710 J. Furlow at field office/lab. B. Kristiansen running standards to calibrate GC.

0725 Photovac HL-200 and Horiba U-10 calibrated

0730 Waiting on Fugro crew to arrive from Atlanta.

1046 Jeff Cahn of Fugro at SAIC field office. Helper not on site yet.

1100 Mobilizing CPT rig to IGW-83 location.

1115 Helper Tim Chaney on site.

1130 CPT rig set up on IGW-83 location.

1134 Begin pushing to depth of 35' at IGW-83.

1147 Sampling tool pushed to depth of 35' at IGW-83.

1155 No water at depth of 35'. Pulling rods out of hole to push deeper.

1205 Pushing back in same hole to depth of 45'.

1218 Sampling tool pushed to depth of 45' at IGW-83.

1225 Begin sampling at depth of 45' at IGW-83.

1233 Groundwater sample IGW-83-01 collected from depth of ~~85~~ JWF 45'.

1247 Groundwater sample IGW-83-01 relinquished to B. Kristiansen at field lab. Fugro CPT rig stuck in soft ground at IGW-83. Fugro crew working to get rig out.

1430 Fugro CPT rig unstuck, off soft ground. Fugro crew going to swap CPT rig for GeoProbe rig for locations IGW-94 and IGW-95.

May 5, 1998

1500 GeoProbe rig set up on IGW-94.
Begin pushing to depth of 17'.
1506 GeoProbe tool hits refusal at 12' bls.
Sampling tool opened up, no water in sampling tool at depth of 12'. Pulling rods out to push deeper at a new location.
1520 GeoProbe sampling tool pushed to depth of 17' at IGW-94 location.
1528 Begin sampling at depth of 17' at IGW-94.
1530 Groundwater sample IGW-94-01 collected from depth of 17' at IGW-94 location.
1551 Groundwater sample IGW-94-01 relinquished to B. Kristiansen at field lab.
1625 GeoProbe sampling tool pushed to depth of 17' at IGW-95 location.
1626 Begin sampling at depth of 17' at IGW-95.
1631 Groundwater sample IGW-95-01 collected from depth of 17'.
1648 Groundwater sample IGW-95-01 relinquished to B. Kristiansen at field lab.
1725 B. Kristiansen off site for day.

J.W. Fulmer
5/5/98

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RWA 05/06/98

May 6, 1998

0740 Phil (PW) Albenesius filling the role of Tech. Oversight / Health and Safety Oversight (Field Manager) today. Jim Furlow is off today.

Bruce K. and Fugro crew are waiting at Bldg 7.

0800 PWA inspects CPT decon area and is not satisfied with the pad construction. Asks CPT crew to re-build the pad. Crew Complies.

Bruce K. briefs PWA on the GC operation.

0830 PWA provides tailgate safety briefing to Fugro Crew, Jeff Cahn and Tim Chaney.

0845 PWA recons and stakes location IGW-78.

0900 PWA called back to field office to take a call from Augusta. Gets trip blanks and bottles, labels, cooler ready for sampling.

0930 Back at decon area. Decon pad rebuilt to the satisfaction of PWA.

0945 At IGW-78. Moved location approx. 100' East of N-S running gravel road. CPT crew is going to push a dummy tip to 20 FT to ~~ensure~~ PWA ensure that shallow refusal won't hamper sampling operations

PWA Calibrates PID. Ambient air 0.7 ppm prior to calibration. Calibrated using 97 ppm span gas. Calibration read up to 99.6 ppm after instrument message said "ready."

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05/06/98 PWA

Ambient air 0.0 ppm after calibration.
Horiba calibration
pH = 4.02
Conductivity = 4.47 mS/cm
turbidity = 0
do = 8.60 mg/l
Temp = 23.0° C
Salinity = 0.23 %

1015 Dummy tip push at IGW-78 was successful. Crew is pushing groundwater sampler. Breathing zone inside truck is 0.0 ppm.

1025 Pushed to 1525 cm. Pulled back to open sampler. Verified w/ rubber glove that sampler opened and water came in. PID reading at open pipe is 0.0 ppm.

1035 Sent bailer down. Filled Horiba Cup. Measured field parameters
pH 4.84 4.60 stable
Cond. 0.179 mS/cm
turb 750 initial → 290 stable
DO 9.10 mg/l
22.5° C Temp
Sal 0.0 %

1045 Filled 3, 40 ml vials. One for field screen and two for GEL. Placed both samples in cooler on ice immediately. Ensured that zero headspace existed in vials.

1050 Crew is tripping out and preparing to move. Will grout at the end of the day.

1052 PWA takes samples to field lab.

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RWA 05/06/98

Turned over custody of samples to Bruce K.

1115 At IGW-97. Moved south and east of previous attempt ~ 50 FT. Fugro will push a dummy tip to 20 FT.

1135 Dummy push successful. Pushing gw sampler to 40 FT. Elevation difference from IGW-97 to IGW-78 or IGW-86 appears to be 10-15 FT. Those two locations were sampled at 50 FT BLS.

1155 40 FT. Pulled sampler open. Verified presence of water with rubber glove. PID at open pipe 0.0 ppm.

1205 Bailing w/ stainless bailer. Field parameters
pH = 6.82. Bogus. Forgot to remove rubber.
Cond. = 0.070 mS/cm
Turb. = 701 ~~mS/cm~~
DO = 8.88 mg/l
Temp = 22.2 °C
Sal = 0.00 %
Filled one 40ml vial for field screen. Filling two 1-liter amber jars for off-site SVOCs.

1215 Breathing zone still 0.0 ppm. Also 0.0 ppm at mouth of large sample bottle.

1235 Samples collected. PWA takes samples to Bruce K. while crew trips out. They will move to IGW-104. Custody of samples turned over to Bruce.

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PWA 05/06/98

1230 PWA to lunch.
1330 Picked up mail at Tom Yocum's office. Filled Eyewash station. It had spilled earlier.
1350 Alan Shirey and Dave Roulo from USACE at field office.
1400 PWA sets up CPT rig at IGW-104. This location is at what appears to be an equivalent elevation to IGW-98 which was sampled at a depth of 50 ft bls. IGW-90, to the east, was sampled at 57 ft. It is discernibly higher topographically than IGW-104.
1410 Pushing to 50 FT.
1430 Stopped at 1529 cm. Verified presence of water w/ rubber glove. Breathing Zone 0.0 ppm. Right at open pipe 0.0 ppm.
1435 Bailing and measuring field parameters.
pH - 5.36 start → 4.90 stable
Cond. - 0.087 mS/cm
* Turb - 160 → 135 (after 1 min.)
DO - 8.75 mg/L
Temp - 23.6°C
Sal - 0.0
1445 Pulled 1-40ml vial sample w/o headspace. PID at sample and at open pipe 0.0 ppm.
* Fines settled out quickly in field parameter sample.
1455 PWA takes sample to Bruce K. Relinquishes custody.
1505 Shows Jeff sample location IGW-103.

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PLWA 05/06/98

USACE personnel visiting Tom yxum.
1515 PWA decons bailer back at field office.
1530 PWA and USACE at IGW-103. Ready to push.
1535 Pushed to 48 FT. Opened sampler. Verified presence of water w/ rubber glove.
1550 At depth. Measured field parameters w/ Horiba.
PID in breathing zone and at open pipe is 0.0 ppm.
pH = 6.7 begin → 5.60 after ~60 sec.
Cond. = 0.039 mS/cm
Turb = 999
DO = 8.70 mg/L
Temp = 24.8° C
Sal = 0.00 %
1600 Collected 40 ml sample. Took sample to Bruce K. and relinquished custody.
1615 Fugro crew is tripping out and then going around to grout the four locations sampled today.
PWA and USACE reconning power-line right of way south of AP looking for new locations. Found a spot for ISG-93 and then added 3 locations: IGW-106 to mimic Rusts IGW-17; ISG-107 and ISG-108 in power line right of way.
1715 Back to Field office. Discuss project with Dave Roulo and Alan

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05/06/98.

Shirey.
1800 Alan and Dave depart.
Jim Furlow called and will not be on-site tomorrow.
PWA decons bailers and Horiba.
1815 PWA calls Jim Furlow.
1830 PWA departs.
End 05/06/98

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05/06/98

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PWA 05/07/98

May 07, 1998

0730 PWA arrives at field office. Wraps deconned bailers in foil. Goes back to Fina for ice for cooler.

0745 Back at office. Calibrate PID.
96.9 – 99.0. Used 97 ppm span gas. Immediate reading on span gas 96.9 and then drift up to 99.0.

Calibrate Horiba
pH 4.0
Cond. 4.48 mS/cm
Turb. 0
DO 8.39 mg/l
Temp 23.7° C
Sal 0.23

0800 ~~P~~ PWA to decon area to find Fugro crew. Crew is steamcleaning drill rod. Jeff Cahn verified the ~~the~~ four locations done yesterday were grouted to ground surface with a cement/bentonite grout. Tremie pipe inserted into holes reached bottom or near bottom in all cases.

0830 Back at office. PWA Conducted safety brief.

0845 Mob to IGW-93 location. PWA took Jeff Cahn around to proposed locations IGW-93, 706, -107, and -108. Determined that all locations required the Geoprobe rig.

0900 Mobilizing the Geoprobe rig.

0915 Geoprobe rig is on IGW-93 in power line right of way ~ 40 ft east of drainage swale, downgradient of IGW-104.

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05/07/98 Phil

pH 5.06 → 5.13 (10 sec.)
Cond. 0.18 mS/cm
Turb 46
DO 9.66 mg/l
Temp 20.6 °C
Sal 0.0.

0945 Sample collected from 35 FT. Screen opened 1 FT (34-35). Field parameters measured and listed above.
PID reading 3 to 4 ppm background. At the open pipe, 5 to 6 ppm (2 ppm > bkgd). Heavy air and heavy blooming vegetation may be affecting PID.
40 ml sample vial filled for field GC analysis.

0950 PWA takes sample to Bruce K. Relinquishes custody of sample. Decon bailer. Calls office to line up Wayne Parker for tommorow.

1020 PWA to IGW-106. Pushed to 25 FT. Opened Screen 24-25 FT. Collected Sample for field parameters and then filled sample vial.
Field parameters
pH 5.84 → 6.13 (after 60 seconds).
Cond. 0.131
Turb 999
DO 9.64 mg/L
Temp 20.0 °C
Sal 0.00 %
PID background was 2-3 ppm. At the open pipe, 5-6 ppm.

PWA

~~In~~ The

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PWA 05/07/98

In the breathing zone 3-4 ppm (0-1 ppm > bkgd). Air is still heavy, overcast skies.

1040 PWA takes groundwater sample to Bruce K while Fugro moves rig to IGW-107. Relinquishes sample, decons bailer.

1100 PWA to IGW-107. Push to 4: FT. Collected field parameters and a 40ml sample.

Field parameters.

pH - 6.17

Cond. - 0.271 mS/cm

Turb -999

DO - 9.07 mg/L

Temp - 21.0 °C

Sal - 0.01 %

Raining during sample collection. PID apparently aspirated some moisture and so couldn't get an accurate measurement. Was reading background > 10 ppm.

Sample collection time was 1145.

1155 PWA took sample to Bruce K and relinquished custody. Updated TCE contours.

1215 PWA breaks for lunch.

1300 Back at field office

1330 Fugro returns. Mobilize geoprobe rig to IGW-108.

1345 Pushing water sampler

1355 Pushed to 45 FT. PID background is 0.0 ppm.

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Phil 05/07/98

1400 Pulled open screen (44-45). PID at open pipe 0.0 ppm.
Collected sample for field parameters.
pH = 6.14 → 5.85 (after 60 seconds).
Cond. = 0.107 mS/cm
Turb = 999 → 490 (after 60 seconds).
DO = 9.95 mg/L
Temp = 22.4° C
Sal = 0.00 %

1410 Collected 40 ml vial sample. Rain quit during lunch. It is now partly cloudy to partly sunny with a light breeze. Air Temp 75° F.

1420 PWA took sample to Bruce K. and relinquished custody. Deconned bailer and Horiba.

1445 PWA met Fugro crew at IGW-105 location.

1450 Setting up to push to 15 ft for gw.

1455 Pushed to 16 FT BLS. Opened screen 15-16 ft. Checked breathing zone and open pipe with PID 0.0 ppm.

1505 Collected sample for field parameters. Water is very turbid and dark yellowish orange.
pH = 6.25 → 6.19 (after 60 sec)
Cond. = 0.064 mS/cm
Turb = 871 → 856 (after 60 sec).
DO = 10.12 mg/l
Temp = 21.3 °C
Sal = 0.00

This water has more fines than other recent samples. Not settling out.

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PWA 05/07/98

1510 Collected 40ml sample for field screen IGW-105-01.
1520 Took sample to Bruce K and relinquished custody.
1530 PWA staking locations from yesterday and for tommorrow.
1645 Fugro is cleaning up from grouting holes.
1700 Wayne Parker on site. Fugro crew stops by and reports that grouting is complete. They are leaving site for today. PWA turns over remaining groundwater sampling to Wayne Parker

End 05/07/98

Intentionally Not Used
PWA 05/07/98

uh 05/08/98

05/08/98

0730 W. Parker @ ~~IGW-102~~ WHP 05/08/98 Field office and calibrates Horiba water Quality checker and PID

0845 FUGRO CPT Truck moves onto location IGW-102 To start push

0900 Start Push 0.0 ppm in BZ

0910 0.0 ppm in BZ

0915 Complete pushing to 55 BLS 0.0 ppm in BZ pull open screen 1 foot.

0917 0.0 ppm @ CPT pipe

0920 Collect sample IGW-102-01
Ph = 4.69 Con = .096
Turb = 905 Temp = 24.6
Sal = 0.00 DO = N/A

0930 CPT Crew pulling Rods

1000 CPT Crew @ location IGW-101 To start pushing

1005 Level Rig and pushing 0.0 ppm in BZ

1010 0.0 ppm in BZ

1020 0.0 ppm in BZ

1030 Completed pushing to 55 BLS

1035 pull screen open to 54

1040 Collect sample 0.0 ppm @ pipe
Ph = 4.92 Con = .097 Turb = 490
DO = N/A Temp = 24.2
Sal = 0.00

1350 CPT Crew mixing grout to abandon holes IGW-101 and 102

05/08/98

1545 W. Parker Completes Checking all CPT Holes for Complete grouting. All CPT Holes Had grout TO Surface

WP 05/08/98

7ILB 10/05/98

Slug Tests
MW-18U
MW-18L

05 Oct 98

0800 Depart Augusta

1055 Meet with Jim Furlow, Bruce Kristiansen, Mike Gilchrist at Landfill. Get keys for wells and office from Jim Furlow.

1145 Return to field office. Fill 5' slug with Foster Dixiana FX-50 Filter Sand.

1205 Set up at MW-29. Jim Furlow arrives to discuss slug test strategy. We decide that Mike Gilchrist will help S.S. slug test Landfill wells due to health and safety issues concerning working alone. Will meet MG. at Landfill @ ~1245

1315 Set up at MW-18DU

Water level @ 2.90 ft bTOC

Tag bottom @ 9.19 ft bTOC

$$\begin{array}{r} 9.19 \\ -\ 2.90 \\ \hline 6.29 \text{ ft} \end{array}$$

Transducer set @ ~0.5 ft from bottom

Bottom of slug @ 8.0 ft bTOC

1340 Hermit Test # 01 MW-18U Falling Head Test

Reference = 0

1410 Hermit reading = 1.018 ft H_2O

Note: may have bumped transducer with slogging while starting test.

Water level @ 2.90 ft bTOC

Test is complete.

1420 Hermit Test #02 MW-18U Rising Head Test

1423 MW-18L water level @ ~~2.04~~ 2.04 ft bTOC

Tag bottom @ 20.01 ft bTOC

1437 MW-18U Rising Head Test complete

1445 Hermit Test #03 MW-18L Falling Head Test

Bottom of slug @ 10 ft bTOC

Reference = 0

Transducer @ ~1 ft from bottom

PLLB 10/06/98

Slug tests
MW-18U
MW-18L
MW-15

05 Oct 98

1500 Stop test #03
Hermit test #03 is not valid.
1505 Hermit Test #04 MW-18L Falling Head Test
Reference = 0
All settings are same as test #03.
1526 MW-18L Falling Head Test complete
Hermit Test #05 MW-18L Rising Head Test
Reference = 0
All settings are same as test #04.
1550 Hermit Test #06 MW-18U Falling Head Test
Note: Tests #01-03 are not valid.
Reference = 0
All Settings are same as test #01.
1605 Hermit Test #08 MW-18U Rising Head Test
Reference = 0
All settings are same as test #02
Note: Test #07 is invalid.
1638 Set up at MW-15
Water level @ 6.91 ft bTOC
Tag bottom @ 17.51 ft bTOC
Transducer set @ ~ 1 ft from bottom
Bottom of slug @ 15 ft bTOC
1654 Hermit Test # ~~08~~ 09 MW-15 Falling Head Test
~~1715~~ 1713 Probe connected to wrong channel on
1717 datalogger. Test #09 invalid.
~~1717~~ Hermit Test #10 MW-15 Falling Head Test
1738 Delete Hermit Test #01
1740 Hermit Test #01 MW-15 Rising Head Test
1802 At field office unloading equipment.
1810 Depart site.

10/06/98

PILB [signature] 10/06/98

Slug Tests
MW-21
MW-16
MW-12

06 Oct 98

~~0800~~ 0700 Arrive at field office. Receive H+S briefing from J.F.

0755 At Landfill preparing to mobilize to MW-21.

0856 At MW-21

Water level @ 3.01 ft bTOC

Tag bottom @ 11.13 ft bTOC

Transducer @ ~0.5 ft from bottom

Bottom of slug @ 9 ft bTOC

	11.13
	3.01
	8.12 ft

0915 Hermit Test # 01 MW-21 Falling Head Test

0948 Hermit Test # 02 MW-21 Rising Head Test

0956 Stop MW-21 Rising Head Test.

1024 At MW-16

Water level @ 3.52

Tag bottom @ 9.00 ft bTOC

Transducer @ ~0.25 ft from bottom

Bottom of slug @ 7.5 ft bTOC

	9.00
	3.52
	5.48 ft

1029 BK and JF just finished developing at MW-16. Will wait ~10 min for well to recover.

1044 Not enough water in well to submerge entire slug.

1047 Hermit Test # 03 MW-16 Falling Head Test

1105 Hermit Test # 04 MW-16 Rising Head Test

1127 Stop MW-16 Rising Head Test.

1158 At MW-12

Water level @ 4.98 ft bTOC

Tag bottom @ 18.54 ft bTOC

Transducer @ ~1 ft from bottom

Bottom of slug @

	18.54
	4.98
	13.56 ft

1202 Hermit Test # 05 MW-12 Falling Head Test

1228 Hermit Test # 06 MW-12 Rising Head Test

1242 Stop MW-12 Rising Head Test

PHB 10/06/98

Slug tests
MW-17
MW-14

06 oct 98

1407 At MW-17

Tag bottom @ 19.57 ft bTOC

Water level @ 9.11 ft bTOC (taken @ 1510)

Transducer @ ~ 1 ft from bottom

Bottom of slug @ 16 ft bTOC

19.57
9.11
10.46 ft

1410 Waiting for well to recover after pulling out bailer left in well.

1440 Well recovering @ a rate of ~~0.25~~ ~0.025 ft/min

1455 Will let well recover so that well screen is submerged and then perform slug test. No well construction data, but assume 10 ft screen.

1513 Hermit Test # 07 MW-17 Falling Head Test

1532 Stop MW-17 Falling Head Test
Well recovery is very slow. Abandon attempts at slug testing until we speak with PWA for guidance.

1607 At MW-14

Water level @ 6.32

Tag bottom @ 11.34 ft bTOC

Transducer @ ~ 3 in. from bottom.

Bottom of slug @ 9.5 ft

11.34
6.32
5.02 ft.

1612 Not enough water in well to submerge entire slug.

1620 Hermit Test # 08 MW-14 Falling Head Test

1634 Hermit Test # 09 MW-14 Rising Head Test

1730 At field office unloading equipment.

1740 Depart site

06 oct 98

PILB 10/07/98

Slug Tests
MW-29,
MW-31, MW-28
MW-30, MW-36

07 Oct 98

0715 At field office loading equipment.

0745 At MW-29

Water level @ 59.61 ft bTOC — 68.04 − 59.61 = 8.43 ft

Tag bottom @ 68.04 ft bTOC

Transducer @ ~ 1 ft from botom

Bottom of slug @ 65.50 ft bTOC

0810 Hermit Test #01 MW-29 Falling Head Test

0825 Hermit Test #02 MW-29 Rising Head Test

0855 At MW-~~28~~ 31

water level @ 27.39 ft bTOC — 37.55 − 27.39 = 10.16 ft

Tag bottom @ 37.55 ft bTOC

Transducer @ ~ 1 ft from bottom

Bottom of slug @ ~~[illegible]~~ 34.00 ft bTOC

0915 Hermit Test #03 MW-31 Falling Head Test

0935 Hermit Test #04 MW-31 Rising Head Test

1000 At MW-28

Water level @ 11.46 ft bTOC — 20.09 − 11.46 = 8.63

Tag bottom @ 20.09 ft bTOC

Transducer @ ~ 0.5 ft from bottom

Bottom of slug @ 17.00 ft bTOC

1022 Hermit Test #05 MW-28 Falling Head Test

1036 Hermit Test #06 MW-28 Rising Head Test

1057 At MW-30

water level @ 37.04 — 45.38 − 37.04 = 8.34

Tag bottom @ 45.38 ft bTOC

Transducer @ ~ 0.5 ft from bottom

Bottom of slug @ 43.00 ft bTOC

1113 Hermit Test # 07 MW-30 Falling Head Test

1141 Hermit Test # 08 MW-30 Rising Head Test

1201 At field office downloading Hermit.

1421 At MW-36

Water level @ 9.04 — 20.02 − 9.04 = 10.98 ft

Tag bottom @ 20.02 ft bTOC

PILB 07 Oct 98

Slug Test
MW-36,
MW-47, MW-56,

07 Oct 98

(MW-36) Transducer @ ~ 1 ft from bottom
Bottom of slug @ 17.00 ft bTOC

1434 Hermit Test #01 MW-36 Falling Head Test
1500 Hermit Test #02 MW-36 Rising Head Test
1543 At MW-47
Water level @ 43.81 ft bTOC   51.30
Tag bottom @ 51.30 ft bTOC   −43.81
Transducer @ ~ 0.5 ft from bottom   7.49 ft
~~Slug~~ Bottom of slug @ 49.00 ft bTOC
1610 Hermit Test #03 MW-47 Falling Head Test
1625 Hermit Test #04 MW-47 Rising Head Test
1644 At MW-56
Water level @ 33.21 ft bTOC   41.02
Tag bottom @ 41.02 ft bTOC   33.21
Transducer @ ~ 0.5 ft ~~of~~ from bottom   7.81
Bottom of slug @ 39.50 ft bTOC
1700 Hermit Test #05 MW-56 Falling Head Test
1718 Hermit Test #06 MW-56 Rising Head Test
1725 Test complete.
1745 Depart site

07 Oct 98

PILB 10/08/98

Slug Tests 45
MW-63, MW-~~56~~, MW-58
MW-~~70~~71

080ct98

0815 At field office loading equipment.

0820 At MW-63

Water level @ 6.92 ft bTOC — 15.46

Tag bottom @ 15.46 ft bTOC — 6.92

Transducer @ ~ 1 ft from bottom — 8.54 ft

Bottom of slug @ 13.50 ft

0844 Hermit Test #01 MW-63 Falling Head Test

0859 Hermit Test #02 MW-63 Rising Head Test

0925 At MW-~~56~~45

Water level @ 18.03 ft bTOC — 30.59

Tag bottom @ 30.59 ft bTOC — 18.03

Transducer @ ~ 1 ft from bottom — 12.56 ft

Bottom of slug @ 27.00 ft bTOC

0958 Hermit Test #03 MW-45 Falling Head Test

1005 Hermit Test #04 MW-45 Rising Head Test

1034 At MW-58

Water level @ 37.56 ft bTOC — 44.58

Tag bottom @ 44.58 ft bTOC — 37.56

Transducer @ ~ 0.25 ft from bottom — 7.02 ft

Bottom of slug @ 43.00 ft ~~from~~ bTOC

1050 Hermit Test #~~05~~07 MW-58 Falling Head Test

1105 Hermit Test #06 MW-58 Rising Head Test

1133 PWA onsite from ~ 1055 - 1130

~~Note MW-56 Falling Head Test not valid Datalogger did did not start.~~ 10/08/98

1139 At MW-~~70~~71

Water level @ 17.38 ft bTO — 25.50

Tag bottom @ 25.50 ft bTOC — 17.38

Transducer @ ~ 1 ft from bottom — 8.12 ft

Bottom of slug @ 23.50 ft bTOC

1203 Hermit Test #05 MW-71 Falling Head Test

1215 Hermit Test #08 MW-71 Rising Head Test

10/08/98

PILB 10/08/98

Slug Tests
MW-69, MW-61, MW-62
MW-73,

08 Oct 98

1246 At MW-69
Water level @ 45.19 ft bTOC
Tag bottom @ 51.49 ft bTOC — 51.49
Transducer @ ~~[illegible]~~ bottom — 45.19
Bottom of slug @ 50.50 ft bTOC — 6.30

1257 Hermit Test #09 MW-69 Falling Head Test
1315 Hermit Test #10 MW-69 Rising Head Test
1358 At field office downloading datalogger
1435 At MW-61. PWA onsite.
Water level @ 42.03 ft bTOC — 50.48
Tag bottom @ 50.48 ft bTOC — 42.03
Transducer @ ~ 1 ft from bottom — 8.45 ft
Bottom of slug @ 48.00 ft bTOC

1503 Hermit Test #01 MW-61 Falling Head Test
1515 Hermit Test #02 MW-61 Rising Head Test
1538 At MW-~~73~~ 62 PWA gone.
Water level @ 36.80 ft bTOC — 46.20
Tag bottom @ 45.20 ft bTOC — 36.80
Transducer @ ~ 1 ft from bottom — 10.40
Bottom of slug @ 42.00 ft bTOC

1557 Hermit Test #03 MW-~~73~~ 62 Falling Head Test
1615 Hermit Test #04 MW-62 Rising Head Test
1634 At MW-73 — 39.16
Water level @ 29.98 ft bTOC — ~~40.77~~
Tag bottom @ 40.77 ft bTOC — 29.98
— 10.79
Transducer @ ~ 1 ft from bottom
Bottom of slug @ 38.00 ft bTOC

1650 Hermit Test #05 MW-73 Falling Head Test
1705 Hermit Test #06 MW-73 Rising Head Test
1712 Datalogger terminates test. Data looks to be complete. Mobilize to MW-72
1719 At MW-72
Water level @ 19.50 ft bTOC

A142

DLB [illegible] 10/08/98

Slug Tests
MW-72

08 Oct 98

(MW-72) Tag bottom @ 28.74 | 28.74
Transducer @ ~1 ft from bottom | 19.50
Bottom of slug @ 26.00 ft bTOC | 9.24

1735 Hermit Test #07 MW-72 Falling Head Test
1748 Hermit Test #08 MW-72 Rising Head Test
1815 Depart site.

08 Oct 98

PILB 10/09/98

slug Tests
MW-43, MW-38
MW-49, MW-33

09 Oct 98

0842 At MW-43
Water level @ 50.96 ft bTOC — 58.44
Tag bottom @ 58.44 ft bTOC — 50.96
Transducer @ 0.5 ft from bottom — 7.48
Bottom of slug @ 57.00 ft bTOC
0858 Hermit Test #09 MW-43 Falling Head Test
0912 Hermit Test #10 MW-43 Rising Head Test
0938 Downloading datalogger.
1018 At MW-38
Water level @ 57.19 ft bTOC — 65.03
Tag bottom @ 65.03 ft bTOC — 57.19
Transducer @ ~0.5 ft ~~b~~ from bottom — 7.84
Bottom of slug @ 63.00 ft bTOC
1029 Hermit Test #03 MW-38 Falling Head Test
1042 Hermit Test #04 MW-38 Rising Head Test
1106 At MW-49 after obtaining permission from Politex to enter fenced area.
Water level @ 37.70 ft bTOC — 48.52
Tag bottom @ 48.52 ft bTOC — 37.70
Transducer @ ~1 ft from bottom — 10.82
Bottom of slug @ 46.00 ft bTOC
1119 Hermit Test #05 MW-49 Falling Head Test
1132 Hermit Test #06 MW-49 Rising Head Test
1145 While attempting to check data, datalogger abruptly ~~ended~~ ended test. Check of data show that test was complete.
1206 At MW-33 (flush mount) after getting socket from drillers.
water level @ 42.92 ft bTOC — 51.18
Tag bottom @ 51.18 ft bTOC — 42.92
Transducer @ ~0.5 ft from bottom — 8.26
Bottom of slug @ 49.00 ft bTOC
1222 After datalogger blinked out on previous

P.I.B 10/09/98

Slug Tests MW-33
MW-70

09 Oct 98

test clock was not reset. Datalogger
will not take reading if clock is not
set ∴ MW-33 Falling Head Test is invalid.
Since MW-33 is a water table well, will
not redo falling head test. Hermit Test #01
is invalid.

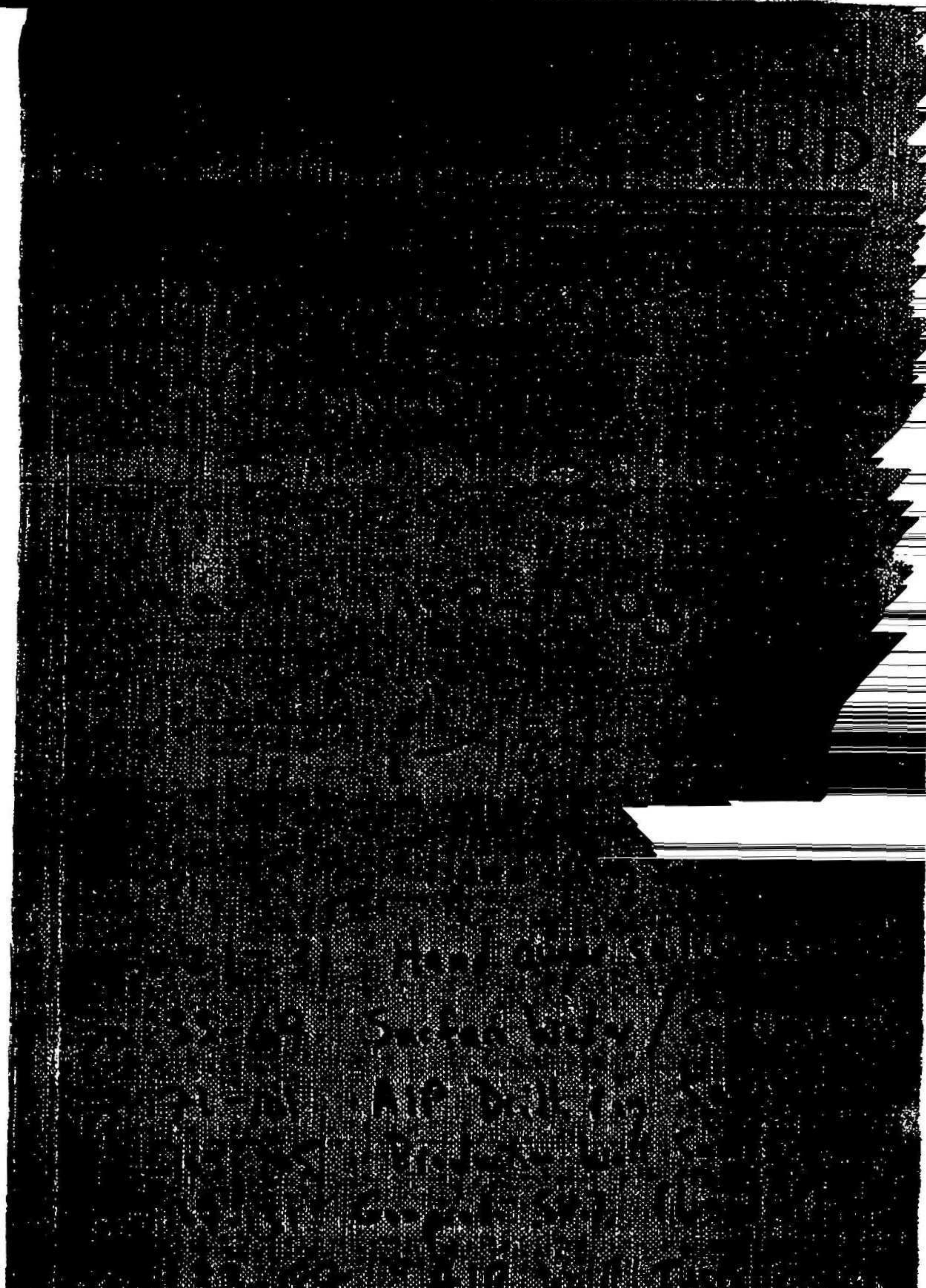
1228 Hermit Test #02 MW-33 Rising Head Test

1301 At MW-70

Waterlevel @ 30.78 ft bTOC 41.00
Tag bottom @ 41.03 ft bTOC 30.78
Transducer @ 1 ft from botom 10.25
Botton of slug @ ~~39.00~~ 38.00 ft bTOC

1312 Hermit Test #07 MW-70 Falling Head Test
1332 Hermit Test #08 MW-70 Rising Head Test
1423 Depart site.

10/09/98



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START

May 12, 1998 Weather: Clear, warm
Field Team: Jim Furlow, Bruce Kristiansen
Project: AIP Hand Augering

0715 J. Furlow and B. Kristiansen at SAIC field office, sorting out sample containers, custody chains, etc.
0940 PID calibrated.
1030 J. Furlow and B. Kristiansen at Hand Auger location ISL-64.
1035 Surface soil sample ISL-64 collected (2 125ml. jars for VOAs).
1044 Sampling team at ISL-65 location.
1050 Soil sample ISL-65 collected (2 VOA jars)
0'-0.5', Coarse grained dark brown, slightly clayey sand
0.5'-1.0' Fine grained light brown, very clayey sand.
1057 Sample team at ISL-78.
1100 Soil sample ISL-78 collected (2 VOA jars).
0'-1': Medium brown, silty to slightly clayey sand
1114 Sampling team at ISL-92 location
1118 Soil sample ISL-92 collected (2 VOA jars)
0'-1' Sand: dark orange brown, fine to med. grained clayey.
1122 Sampling team at ISL-105 location.
1130 Soil samples ISL-105, ISL-105A and ISL-105D collected. ISL-105 was 2 VOA jars, ISL-105A was ~~one~~ 2 VOA jars (Duplicate) and ISL-105D was one VOA jar for CDE (split).
0'-0.5 Sand: medium to dark brown, fine grained, slightly silty.
0.5-1.0 Sand: dark brown, fine grained, clayey.
1250 Sampling team at ISL-104 location
1300 Soil sample ISL-104 collected

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J. W. Finder 5/12/98

May 12, 1998
(2 VOA jars).
0'-0.5' Sand: dark brown, fine grained, silty
0.5'-1.0' Sand: medium brown, fine grained, clayey
1306 Sampling team at ISL-93 location
1310 Soil sample ISL-93 collected from 0'-1' (2 VOA jars)
0'-1' Sand: dark red-brown, fine to medium grained, clayey.
1320 Sampling team at ISL-100 location
1325 Soil sample ISL-100 collected 0'-1' (2 VOA jars)
0'-0.5' Sand: dark brown, fine grained, silty.
0.5'-1.0' Clay: red-brown, medium grained, sandy to very sandy.
1330 Sampling team at ISL-101 location
1335 Soil sample ISL-101 collected (2 VOA jars)
0'-1' Sand: dark red-brown, fine to medium grained, silty, clayey
1342 Sampling team at ISL-103 location
1350 Soil sample ISL-103 collected (1 VOA)
0'-0.5' Sand: dark brown, fine grained, silty.
0.5-1.0 Sand: dark orange brown, fine grained, silty
1400 Back to field office to decon tools.
1440 Chain of custody for above samples relinquished to secure cooler / GEL.
1510 Cooler delivered to Fed Ex for shipment.
1600 J. Furlow off site for day.

J. W. Furlow 5/12/98

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J. W. Fuller 5/13/98

May 13, 1998 Weather: Clear, warm
Field Team: Jim Furlow, Bruce Kristiansen
Project: AIP Hand Auger Soil Sampling

0720 Conduct Daily Tailgate safety meeting.
0725 Photovac HL-200 calibrated.
0740 Sampling team at ISL-94 location.
0750 Soil sample ISL-94 collected (1 VOA jar).
0'-1' Sand: dark red-brown, fine to medium grained, clayey.
0758 Sampling team at ISL-102 location.
0803 Soil sample ISL-102 collected (1 VOA jar).
0'-1' Sand: dark brown, fine grained, silty.
0812 Sampling team at ISL-66 location
0820 Soil samples ISL-66 (1 VOA jar), ISL-66A (1 VOA jar) and ISL-66D (1 VOA jar) collected.
0'-1' Sand: dark brown, fine grained, silty, slightly clayey; with 1" lens of dark red clay.
0839 Sampling team at ISL-67 location.
0845 Soil Sample ISL-67 collected (1 VOA jar)
0'-1' Sand: dark brown, fine grained, silty.
0850 Sampling team at ISL-68 location.
0855 Soil sample ISL-68 collected (1 VOA jar)
0'-1' Sand: dark brown to dark red-brown, fine grained, clayey to very clayey.
0900 Back to field office to decon sampling tools.
0950 Sampling team at ISL-71 location.
0955 Soil sample ISL-71 collected (1 VOA jar, 1 SVOC jar)
0'-0.5' Sand: dark brown, fine grained, silty
0.5'-1.0' Sand: dark red-brown, fine to medium grained, clayey.

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J. W. Furlow 5/13/98

May 13, 1998

1005 Sampling team at ISL-69 location.

1015 Soil samples ISL-69, ISL-69-A and ISL-69-D collected (1 VOA jar and 1 SVOC jar for each sample).

0'-0.5' Sand: dark brown, fine grained, silty.

0.5'-1.0' Clay: dark red-brown, sandy, contains small pebbles.

1025 Sampling team at ISL-70 location.

1035 Soil sample ISL-70 collected (1 VOA jar, 1 SVOC jar)

0'-0.3' Rock fill

0.3'-1.0' Clay: dark red-brown, sandy, stiff. Heavy petroleum odor, PID reads 48 ppm at ground surface.

1046 Sampling team at ISL-79 location.

1050 Soil sample ISL-79 collected (1 VOA jar)

0'-0.8' Sand: light to dark brown, fine grained, silty.

0.8'-1.0' Clay: dark red-brown, sandy, stiff

1057 Sampling team at ISL-84 location.

1100 Soil sample ISL-84 collected (1 VOA jar)

0'-1' Sand: dark brown, fine grained, silty, becomes clayey at bottom.

1115 Back to SAIC field office to decon sampling tools.

1235 Rinsate sample collected (3 40 ml. vials) from auger head to be associated with soil sample at ISL-80 location.

1245 Sampling team at ISL-80 location.

1250 Soil sample ISL-80 collected (1 VOA jar).

0'-1' Sand: dark brown, fine grained, silty.

1300 Sampling team at ISL-81 location.

1305 Soil sample ISL-81 collected (1 VOA jar,

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J.W. Furlow 5/13/98

May 13, 1998

1 SVOC jar).

0'-1' Sand: dark red-brown, fine to medium grained, silty, becomes very clayey at bottom.

1310 Sampling team at ISL-85 location.

1315 Soil sample ISL-85 Collected (1 VOA jar).

0'-1' Sand: dark brown to dark red-brown, fine grained, silty; becomes very clayey at bottom

1325 Sampling team at ISL-82 location

1330 Soil sample ISL-82 Collected (1 VOA jar)

0'-1' Sand: dark brown, fine grained, silty, clayey.

1335 Sampling team at ISL-113 location.

1340 Soil sample ISL-113 collected (1 VOA jar, 1 SVOC jar).

0'-1' Sand: dark red-brown, medium to coarse grained, clayey to very clayey

1400 Sampling team to field office to decon sampling tools.

1445 Packing samples to ship to labs

1540 Samples packed, ready to go to Fed Ex.

1555 All samples shipped to GEL and USACOE.

J W Fowler
5/13/98

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May 14, 1998 Weather: Clear, warm

Project: AIP Hand Auger Soil Sampling

Field Sampling Team: J. Furlow, B. Kristiansen

0715 Conduct Daily Tailgate Health + Safety meeting.

0725 Photovac HL-200 PID calibrated.

0744 Sampling team at ISL-72 location.

0750 Soil sample ISL-72 collected (1 VOA jar, 1 SVOC jar).

0'-0.2' Sand: dark brown, fine grained, silty.

0.2-1.0 Clay: dark red-brown, sandy, stiff

0756 Sampling team at ISL-73 location

0800 Soil sample ISL-73 collected (1 VOA jar, 1 SVOC jar).

0'-1' Sand: dark brown to black, fine grained, silty, with abundant coal fragments.

0805 Sampling team at ISL-74 location

0810 Soil samples ISL-74 (1 VOA jar, 1 SVOC jar) and ISL-74-A (1 VOA jar, ~~1 SVOC jar~~ Discarded JDF 5/14/98) collected.

0'-1' Sand: light brown, fine grained, silty

0826 Sampling team at ISL-89 location

0830 Soil sample ISL-89 collected (1 VOA jar, 1 SVOC jar)

0'-0.5' Sand: dark brown to black, fine grained, silty

0.5'-1.0' Sand: red-brown, fine grained, silty, clayey

0838 Sampling team at ISL-86 location.

0845 Soil sample ISL-86 collected (1 VOA jar).

0'-0.3' Crusher run/gravel fill

0.3-1.0 Clay: dark red-brown, sandy, stiff.

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J. W. Fuller 5/14/98

May 14, 1998
0855 Back to field office to decon sampling tools.
1007 Sampling team at ISL-95 location.
1015 Soil sample ISL-95 collected (1 VOA jar)
0'-1' Clay: dark red-brown, sandy, stiff, medium plasticity.
1017 Sampling team at ISL-96 location
1020 Soil sample ISL-96 collected (1 VOA jar)
0'-0.3' Sand: Dark brown, fine grained, silty.
0.3'-1.0' Clay: dark red-brown, sandy, stiff, low plasticity.
1027 Sampling team at ISL-114 location
1030 Soil sample ISL-114 collected (1 VOA jar, 1 SVOC jar).
0'-0.5' Sand: dark brown, fine grained, silty
0.5'-1.0' Clay: orange-brown, stiff, sandy, medium plasticity
1037 Sampling team at ISL-91 location.
1040 Soil sample ISL-91 collected (1 VOA jar).
0'-1' Clay: orange-red, sandy, stiff, medium plasticity
1044 Sampling team at ISL-90 location
1050 Soil sample ISL-90 collected (1 VOA jar)
0'-0.4' Sand: dark brown, fine grained, silty.
0.4'-1.0' Clay: red-brown, sandy, stiff, medium plasticity
1100 Sampling team at field office to decon sampling tools.
1228 Sampling team at ISL-76 location.
1235 Soil sample ISL-76 collected (1 VOA jar)
0'-1' Clay: dark red-brown, sandy, silty, stiff, low plasticity

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J. W. Fowler 5/14/98

May 14, 1998

1237 Sampling team at ISL-77 location

1240 Soil samples ISL-77 (1 VOA jar) and ISL-77-A (1 VOA jar) collected.

0'-1' Sand: dark brown, fine grained, silty, slightly clayey.

1245 Sampling team at ISL-75 location.

1250 Soil sample ISL-75 collected (1 VOA jar)

0'-0.7' Clay: dark red-brown, sandy, silty, medium plasticity.

0.7'-1.0' Sand: dark brown, fine grained, silty.

1258 Sampling team at ISL-88 location.

1305 Soil sample ISL-88 collected (1 VOA jar)

0'-0.7' Sand: dark red-brown, fine to medium grained, silty

0.7'-1.0' Clay: dark orange, sandy, silty, stiff, medium plasticity.

1310 Sampling team at ISL-83 location.

1315 Soil sample ISL-83 collected (1 VOA jar)

0'-1' Sand: dark brown, fine grained, silty, slightly clayey.

1328 Sampling team back to field office to decon sampling tools.

1420 All samples packed up and delivered to Fed Ex for shipment to GEL.

J.W. Furlow 5/14/98

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J. W. Furlow 5/14/98

17

May 15, 1998

Project: AIP Hand Auger Soil Sampling

Field Sampling Team: Jim Furlow, Bruce Kristlange

0720 Conduct daily Tailgate Health & Safety briefing

0730 Photovac HL-200 PID calibrated

0755 Sampling team at ISL-87 location

0800 Soil sample ISL-87 collected (1 VOA jar).

0'-0.3' Sand: dark brown, fine grained, silty.

0.3'-1.0 Clay: dark red-brown, sandy to very sandy, stiff, low plasticity.

0803 Sampling team at ISL-98 location

0805 Soil sample ISL-98 collected (1 VOA jar)

0'-0.3' Sand: dark brown, fine grained, silty

0.3'-0.6' Clay: dark red with white mottling, sandy, stiff, medium plasticity

0.6'-1.0' Sand: dark brown to red-brown, fine grained, silty.

0815 Sampling team at ISL-99 location.

0820 Soil sample ISL-99 collected (1 VOA jar)

0-0.5' Sand: medium brown, fine grained, silty

0.5-1.0' Clay: dark red-brown, sandy, stiff, medium plasticity

0823 Sampling team at ISL-97 location

0825 Soil sample ISL-97 collected (1 VOA jar).

0'-0.5' Sand: dark red-brown, fine grained, silty, clayey.

0.5'-1.0' Sand: dark brown, fine grained, silty

0840 Sampling team at ISL-107 location.

0845 Soil Sample ISL-107 collected (1 VOA jar)

0'-1' Sand: dark gray to white, fine to medium grained, silty.

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J. W. Furlow 5/15/98

May 15, 1998

0850 Back to field office to decon sampling tools.

09~~45~~ JWF Sampling team at ISL-108 location.

0950 Soil sample ISL-108 collected (1 VOA jar)

0'-1' Sand: dark orange-brown, fine grained, silty, clayey

0956 Sampling team at ISL-106 location.

JWF 5/15/98 ~~1000~~ 1005 Soil sample ISL-106 collected (1 VOA jar)

0'-0.5' Sand: dark brown, fine grained, silty

0.5'-1.0' Clay: dark orange-brown, sandy, soft, medium plasticity.

1015 Sampling team back at field office to decon sampling tools.

1150 J. Furlow and B. Kristiansen off site to ship samples. Sampling of AIP Industrial Area completed.

J.W. Furlow
5/15/98

June 1, 1996

Went to Muop, met with B. Kristianson prepared for drill rig soil sampling.

Alliance drilling crew and surveying crew arrived on site in early afternoon. J. Furlow took surveying crew on tour of site and pointed out numerous locations to be surveyed in, including all core holes. Drill crew set up decon pad and deconned drill tools in preparation for startup of soil sampling. J. Furlow gave Pre-entry Health and Safety orientation to drill crew and survey crew. No surveying work or drilling was done on 6/1/98.

J. W. Furlow 6/1/98

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J.W. Furlow 6/2/98

June 2, 1998 Weather: Clear, warm

~~0705~~ TUE Project: AIP Drill Rig Soil Sampling

Drilling subcontractor: Alliance Environmental

Driller: Mike Coleman Helper: Richard Mooney

Technical oversight: Jim Furlow / Bruce Kristiansen

0705 Drill crew at SAIC field office

0710 Photovac HL-200 calibrated

0715 J. Furlow conducts daily Tailgate Health & Safety briefing.

0735 Drill rig / sampling team at ISL-125 location. Drill crew setting up to begin sampling with CME continuous sampler.

0805 Drill rig kill switches tested (2); one works, other does not.

0810 Both drill rig kill switches working; wire was loose on second switch. Crew rigging up to drill.

0857 Begin drilling / sampling at ISL-125 location.

0920 Soil sample ISL-125-01 collected from 0-2.5' section.

1140 Phil Albenesius on site.

1235 Soil Samples ISL-125-02 and ISL-125-03 collected. ISL-125-02 collected from depth of 6.5'-9' because of headspace reading of 134 ppm (high for boring). ISL-125-03 collected from depth of 29'-31.5', just above water table. Water table depth is 30.2' bls.

1245 Boring ISL-125 completed.

1400 Drill rig & drill tools deconned between borings.

1405 Drill crew setting up on location ISL-123.

1415 Begin drilling / sampling on ISL-123.

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J.W. Tucker 6/2/98

June 2, 1998

1425 Soil sample ISL-123-01 collected from depth of 0'-2'.

1550 ~~1715~~ JWF Soil sample ISL-123-02 collected from depth of 9'-11.5' (PID reading of 246 ppm in headspace)

1715 Soil sample ISL-123-03 collected from depth of 24-26.5' bls (1 ft above water table)

1725 Soil boring ISL-123 completed to depth of 29' bls. Bottom of hole is dry; no water.

1800 Field sampling team back to SAIC field office.

1855 P. Albanesius off site.

1847 J. Furlow off site

J. W. Furlow
6/2/98

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J.W. Furlow 6/3/98

June 3, 1998 Weather: Clear, hot

Project: Drill rig soil sampling

Subcontractor: Alliance Environmental

Driller: Mike Coleman; helper: Richard Moony

Sampling Team: Jim Furlow, Bruce Kristiansen

0720 J. Furlow conducts daily Tailgate Health + Safety briefing

0730 Photovac HL-200 PID calibrated.

0735 J. Furlow and B. Kristiansen at ISL-123 location. ISL-123 boring is dry; no water at bottom of hole.

0750 Drill crew at ISL-123 with water for mixing grout.

0800 Drill crew mixing grout for boring ISL-123.

0811 Soil boring ISL-123 grouted up to ground surface with 5 sacks of cement grout. Grout weight was 13.5 lbs/gal.

0817 Moving to soil boring ISL-125 to grout.

0840 Soil boring ISL-125 grouted up to ground surface with 7 sacks of cement grout. Grout weight was 13.4 lbs./gal.

0852 Drill crew going to decon drill rig and tools.

0935 Drill crew back, loading drums up. Moving to ISL-122 location.

1005 Drill rig at ISL-122 location. Hand augering to depth of 3 feet to check for utilities.

1015 Soil sample ISL-122-01 collected from depth of 0'-2.5'

1026 Drill rig set up over hand augered hole (3'). Crew preparing to start drilling/sampling by hollow stem auger (4.25" ID) and standard split spoons.

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J. W. Furlow 6/3/98

June 3, 1998

1029 Begin drilling on ISL-122 location.
1035 P. Albenesius on site at ISL-122.
1220 John Render of Alliance Environmental on site
1305 John Render off site.
1500 Soil boring ISL-122 completed to depth of 44' bls. Soil samples JWF ISL-122-02 taken at depth of 20'-22' bls (1230 pm) (pid reading of 16 ppm); Soil sample ISL-122-03 taken at depth of 40'-42' bls (1430 pm). Water level measured inside augers at 41.5' bls.
1505 Drill crew pulling augers out of boring.
1540 Drill crew mixing grout to abandon soil boring ISL-122.
1605 Soil boring ISL-122 grouted up to within 4 feet of ground surface with 7 sacks of cement grout; grout mix was 13.2 lbs/gal. Hole will be topped off to ground surface tomorrow morning.
1645 Sampling crew back at SAIC field office to pack and ship samples.
1800 Soil samples collected 6/2/98 and 6/3/98 (ISL-125, ISL-123, ISL-122) delivered to Fed Ex for shipping to GEL.
1830 J. Furlow, P. Albenesius, B. Kristiansen off site for day.

J.W. Furlow
6/3/98

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J. W. Zeller 6/4/98

June 4, 1998 Weather: Clear, wa

Project: AlP Soil sampling by drill rig
Subcontractor: Alliance Environmental
Driller: Mike Coleman; Helper: Richard Moony
Sampling Team: Jim Furlow, Bruce Kristiansen

0715 All field personnel at SAIC office
0720 J. Furlow conducts daily Tailgate Health & Safety meeting.
0730 Photovac HL-200 PID calibrated.
0740 Drill rig at ISL-121 location. Hand auguring to depth of 3 feet. No obstructions encountered.
0750 Soil sample ISL-121-01 collected from 0'-2' interval.
0755 Both kill switches on drill rig tested and in good operating condition. Drill crew setting up to begin drilling on ISL-121 location.
0800 Begin drilling on ISL-121.
0830 PID not working right. Drilling stopped while JF and BK clean/recalibrate PID.
0840 PID recalibrated with new bottle of gas, working right now. Drilling resumed from 8 feet bls.
1100 Soil samples ISL-121-03, ISL-121-03-D and ISL-121-03 A collected from depth of 36'-38' bls. Water level at 37.7' bls. Soil sample ISL-121-02 taken from depth of 20'-22' bls, at 0950 6/4/98. Headspace reading 12 ppm.
1115 Soil boring ISL-121 completed. Drill crew pulling tools out of hole.
1130 Drill crew deconning rig and tools
1200 Soil boring location ISL-126 hand augered to depth of 4 feet. No obstructions encountered.
1210 Soil samples ISL-126-01, ISL-126-01-A
ISL-126-01-D and SVOC sample collected

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J.W. Fuller 6/4/98

June 4, 1998

From 0'-2' depth interval of hand augered boring.
1325 Drill rig deconned, on site at ISL-126 location
1340 Begin drilling / sampling on ISL-126 location.
1620 Boring drilled to depth of 38' bls; water at approximately 36' bls. Soil sample ISL-126-03 collected from 34'-36' sample (1610). Soil sample ISL-126-02 collected from 10'-12' interval (PID headspace 22ppm) (1420)
1640 Drill tools out of hole. Drill crew going to decon drill rig.
1645 Field sampling team going back to SAIC office to pack and ship samples.
1800 All samples collected 6/4/98 delivered to Fed Ex for shipping to labs (2 coolers, one to GEL, one to Specialized Assays, Inc. for COE splits).

J. W. Furlow
6/4/98

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J. W. Farlow 6/5/98

June 5, 1998 Weather: Cloudy, warm

Project: ALP Soil Sampling by drill rig

Subcontractor: Alliance Environmental

Driller: Mike Coleman; Helper: Richard Maney

Sampling Team: Jim Furlow, Bruce Kristiansen

0710 All field personnel at SAIC office

0720 J. Furlow conducts daily Tailgate Safety briefing, discusses need to watch out for storm drains covered by kudzu.

0730 Photovac HL-200 PID calibrated.

0740 Field crew and drill rig at ISL-117 location

0743 Driller's helper drives drill rig into storm drain covered by kudzu. One front wheel entirely in drain, other front wheel on edge of drain. Drill crew going to look for timbers to put under front wheel. Begins to rain hard.

0805 Drill crew back at ISL-117 with timbers.

0815 Drill rig out of storm drain, at ISL-117 location. Setting up to drill.

0836 Begin drilling/sampling on ISL-117

0925 Soil boring ISL-117 completed at depth of 12' bls. Water level in boring is 7.8' bls.

Soil samples collected from ISL-117 location:

ISL-117-01 (0'-2') (0845)

ISL-117-01-A (0'-2') (0845)

ISL-117-03 (6'-8') (0905) (PID 40 ppm)

ISL-117-~~03~~ 02 (4'-6') (0855) (PID 43 ppm)
JWF 6/5/98

0940 Drill crew going to decon drill tools and drill rig.

1005 Heavy rain with frequent lightning.
All work stopped until rain and lightning pass

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J.W. Furlow 6/5/98

June 5, 1998

1115 Rain slacking off - drill crew going out to grout up previously drilled borings.

1200 All samples collected 6/5/98 delivered to Fed Ex for shipment to GEL - 1 cooler.

1340 All borings grouted up to ground surface; soil boring ISL-121 grouted up with 7 sacks of cement grout, weight 13.5 lbs/gal. Soil boring ISL-126 grouted up to ground surface with 5 sacks of cement grout, weight 13.2 lbs/gal. Soil boring ISL-117 grouted up to ground surface with 1 sack of cement grout, weight 13.4 lbs/gal.

1400 Drill crew off site.

J. W. Furlow
6/5/98

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J.W. [illegible] 6/8/98

June 8, 1998 Weather: clear, cool
Project: ALP Soil Sampling by drilling
Subcontractor: Alliance Environmental
Driller: Mike Coleman ; Helper:
Technical Oversight: Jim Furlow, Woody Maloney

0705: Field sampling team on site.
0720 Fish sampling team on site.
0730 Health & Safety Tailgate briefing conducted for fish sampling team.
0740 Photovac HL-200 calibrated.
0810 Drill rig at ISL-115 location
0820 Begin drilling / sampling at ISL-115
0820 Soil samples ISL-115-01, ISL-115-01-D and ISL-115-01-A collected from 0'-2' sample.
0930 Soil boring ISL-115 completed at depth of 20' bls. Water level at 17.5' bls.
0930 Soil sample ISL-115-03 collected from 16'-18' depth (0925)
1005 Soil sample ISL-115-02 collected from 8'-10' sample based on headspace (15 ppm)(0859).
0945 Drill crew off ISL-115 to decon augers.
1010 Driller off site to have drill rig hydraulic hose repaired. No spill.
1045 Hydraulic hose repaired, augers deconned. Driller setting up on location ISL-116.
1051 Begin drilling / sampling at ISL-116 location
1056 Soil samples ISL-116-01, ISL-116-01-A and ISL-116-01-D collected from 0'-2' interval.
1243 Soil boring ISL-116 completed at depth of 30' bls. Water level at 28.0' bls.
Soil sample ISL-116-03 collected from 26'-28' interval (1220)
Soil sample ISL-116-02 collected from

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J. W. Furlow 6/8/98

June 8, 1998

interval of 6'-8' based on headspace reading of 3 ppm (1112).

1250 Drill crew off site to decon drill rig and tools.

1354 Drill rig set up on ISL-110 location

1403 Begin drilling/sampling at ISL-110 location

1408 Soil samples ISL-110-01 and ISL-110-01-D collected from 0'-2' interval.

1630 Soil boring ISL-110 completed at depth of 42' bls. Water level at 39.1' bls.

Soil sample ISL-110-03 collected from depth of 36'-38' bls (1545). Soil sample ISL-110-02 collected from depth of 14'-16' bls (headspace reading of 40 ppm) (1437).

1633 Drill crew off site to decon drill rig and augers.

1710 Drill crew grouted up soil borings:

ISL-110 : 5 sacks of cement, grout weight 13.4 lb/gal

ISL-115: 3 sacks of cement, grout weight 13.6 lb/gal.

ISL-116: 4 sacks of cement, grout weight 14.1 lb/gal.

1715 Drill crew off site for day. No Samples shipped today. Samples collected today will be shipped tomorrow.

J. W. Furlow
6/8/98

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J.W. Furlow 6/9/98

June 9, 1998 Weather: Cloudy, warm
Project: AIP Soil Sampling by drill rig
Subcontractor: Alliance Environmental
Driller: Mike Coleman Helper: Richard Mooney
Technical Oversight: Jim Furlow / Woody Maloney

0710 All personnel at SAIC field office
0715 Daily Tailgate safety meeting conducted.
0720 Photovac HL-200 PID calibrated
0740 Drill rig at ISL-109 location. Setting up to drill.
0753 Begin drilling / sampling at ISL-109 location.
0755 Soil sample ISL-109-01 collected from 0'-2' interval
1030 Soil boring ISL-109 completed to depth of 40' bls. Water level at 38.5' bls.
Soil sample ISL-109-02 selected from 24'-26' on basis of headspace reading of 74 ppm (0918).
Soil Sample ISL-109-03 collected from depth of 36'-38' bls (1015)
1044 Drill crew off ISL-109 site to decon drill tools.
1130 Drill crew setting up on ISL-111 location
1146 Begin drilling / sampling at ISL-111 Location.
1150 Soil sample ISL-111-01 collected from 0'-2' interval
1320 Soil boring ISL-111 completed to depth of 32' bls. Soil sample ISL-111-02 selected from 12'-14' interval on basis of headspace of 21 ppm (1212). Water level in boring ISL-111 measured at 29.6' bls. Soil sample ISL-111-03 selected from 28'-30' interval (1305).
1330 Drill crew off ISL-111 location to decon drill tools.

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J.W. Furlow 6/9/98

June 9, 1998

1410 Drill rig set up on ISL-112 location.

1415 Begin drilling / sampling at ISL-112.

1415 Soil sample ISL-112-01 collected from 0'-2' interval.

1530 Soil boring ISL-112 completed to depth of 34' bls.

1540 Water level in ISL-112 measured at depth of 32.5' bls. Soil sample ISL-112-02 selected from 14'-16' interval on basis of headspace (28 ppm) (1450). Soil sample ISL-112-03 selected from 30'-32' interval on basis of water level at 32.5' (1528)

1550 Sampling team to SAIC field office to pack and ship samples.

1700 Soil samples collected 6/8/98 and 6/9/98 packed and shipped to GEL and Specialized Assays, Inc.

1720 Soil borings drilled 6/9/98 grouted up to ground surface: ISL-109 grouted up with 4 sacks of cement grout; weight was 13.2 lbs/gal. ISL-111 grouted up with 4 sacks of cement, weight was 13.5 lbs/gal. ISL-112 was grouted up with 4 sacks of cement, grout weight was 14.0 lbs/gal.

1745 Drill crew off site for the day.

1815 J. Furlow off site for the day.

J.W. Furlow
6/9/98

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J. W. Fowler 6/10/98

June 10, 1998 Weather: Clear, Warm

Project: AIP Soil Sampling

Sub contractor: Alliance Environmental

Driller: Mike Coleman Helper: Richard Mooney

Technical oversight: Jim Furlow, Bruce Krigstrom, Woody Mac

0710 All personnel at SAIC field office

0715 J. Furlow conducts daily Tailgate Health + Safety briefing

0725 PID (Photovac ML-200) calibrated.

0735 Moving to ISL-120 location

0750 Drill crew setting up to drill on ISL-120.

0805 Begin drilling/sampling on ISL-120 location.

0810 Soil sample ISL-120-01 collected from 0'-2' interval.

1015 Soil boring ISL-120 Completed to depth of 34' bls. Water level at 29.2' bls at 1020 AM. Soil sample ISL-120-02 (2'-4') (0815) selected on basis of headspace (10 ppm). Soil sample ISL-120-03 selected from 28'-30' interval (1005). Phil Albevesius on site.

1030 Drill crew taking drill rig to decon area to decon tools.

1114 Drill rig at ISL-118 location. Crew setting up to drill.

1120 Begin drilling/sampling at ISL-118.

1120 Soil Sample ISL-118-01 collected from 0'-2' interval.

1210 Soil boring ISL-118 completed. Soil sample ISL-118-02 selected from 10'-12' interval (0 ppm) (1135). Soil sample ISL-118-03 selected from 20'-22' interval (1204). Water level approximately 22' bls; unable to get exact measurement. No hits on any

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J. W. Furlow 6/10/98

June 10, 1998

headspace samples.

1245 Rinsate sample ISL-119-01-R collected from stainless steel sampling spoons.

1250 Drill rig at ISL-119 location. Drill crew setting up to drill.

1302 Begin drilling/sampling at ISL-119 location

1302 Soil sample ISL-119-01 collected from 0'-2' interval

1400 Soil boring ISL-119 completed at depth of 26' bls. Water level measured at 23.1' bls. No hits on any headspace jars. Soil sample ISL-119-02 selected from 10'-12' interval (0 ppm headspace) (1320). Soil sample ISL-119-03 selected from 22'-24' interval (1350).

1420 Driller Mike Coleman injures his right elbow while jumping down off the side of the drill rig. Injury consists of a cut to the elbow, along with a painful bruise. J. Furlow offered to take Mike to the local hospital to have the cut sewn up, but Mike declined to go. Grouting of boreholes and moving of drums will be delayed until tomorrow, when Alliance will have additional help on site. Drill crew went back to the motel for the day.

1530 All soil samples (and rinsate) packed up and shipped at Fed Ex for delivery to GEL. J. Furlow at SAIC field office trying to contact Chad Walton at Armstrong to arrange for production well sampling.

1700 Unable to contact Chad Walton, J. Furlow off site for the day.

L.W. Furlow 6/10/98

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J.W. Furlow 6/11/98

June 11, 1998 Weather: Clear, warm
Project: Production Well Sampling
Personnel Present: Jim Furlow, Bruce Kristiansen, Woody Maloney

0730 J. Furlow, B. Kristiansen at SAIC field office.
0740 Begin calling Chad Walton of Armstrong to arrange for production well sampling. Get voice mail on Chad Walton's phone.
1035 Chad Walton contacted, arrangements made to meet him at 8 AM tomorrow morning to sample production wells 3A, 4A, 6 and 7.
1410 Soil borings grouted up to ground surface:
ISL-120, 5 sacks of cement, weight 13.8 lbs/g
ISL-118, 4 sacks of grout, weight 13.5 lbs/g
ISL-119, 4 sacks of grout, weight 13.7 lbs/gal.

All drums of IDW sealed, labeled, and moved to drum staging area.
1415 Alliance Environmental personnel off site to Aiken.
1435 J. Furlow, B. Kristiansen off site for the day.

J. W. Furlow
6/11/98

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J. W. Farlow 6/12/98

June 12, 1998 Weather: clear, hot
Project: Production Well Sampling
Sampling Team: Jim Furlow, Bruce Kristiansen

0730 J. Furlow and B. Kristiansen at SAIC field office.
0753 J. Furlow and B. Kristiansen at Armstrong plant to meet with Chad Walton.
0830 Sampling team and Armstrong personnel at Armstrong production well 4A.
0840 Water samples AWL-4A, AWL-4A-D and AWL-4A-A collected from discharge valve on well 4A (original, ~~at~~ JWF split and duplicate). Well 4A is currently in operation, actively pumping.
0842 Sampling team and Armstrong personnel at Armstrong production well No. 7.
0843 Valve opened, well pumping.
0845 Water sample AWL-7 collected (2 40 ml vials).
0900 Sampling team at AWL-6 (Armstrong production well No. 6).
0902 Valve opened, well actively pumping.
0905 Water sample AWL-6 collected (2 40-ml vials)
0915 Sampling team at Armstrong production well No. 3A. Well 3A is out of operation, and has been out of operation for some years. The pump no longer has a motor mounted on it. No sample collected from Well 3A.
0945 Field sampling team at Georgia Hydrate plant.
0950 Water sample GHW-1 collected from actively running Georgia Hydrate Plant well (2 40-ml vials).

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J. W. Fowlow 6/12/98

June 12, 1998

1005 Field sampling team at SAIC field office to pack and ship samples

1145 Samples collected 6/12/98 delivered to Fed Ex for shipping to laboratories (2 coolers).

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6/12/98

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J.W. Furlow 6/17/98

AIP Monitoring Well Installation

July 20, 1998 Weather: Hot, Clear
Subcontractor: Alliance Environmental, Inc

0955 Scott Martin and Jim Furlow at SAIC field office.
1050 Scott Martin to UPS to pick up field supplies
1230 P. Albenesius on site at SAIC field office
1350 Alliance Environmental drill crews on site (2 drill rigs, 2 crews)
1600 Monitor wells MW-38, 49, 42, 57, 48, 47, 40, 56, 55, 45, 39, 36 staked for location.
1700 J. Furlow conducted Pre-Entry Health & Safety Meeting.
1730 J. Furlow and S. Martin inspect both Alliance Environmental Inc. drill rigs.
1745 Drill crews off site for the day.
1800 J. Furlow and S. Martin off site.

J. W. Furlow
7/20/98

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J. W. Furlow 7/21/98

July 21, 1998 Clear, hot

Project: AIP Monitoring Well Installation

Subcontractor: Alliance Environmental, Inc.

Drillers: Mike Coleman, George Wikinson;

Helpers: Ricky Dearth, Steve Hanson

Technical Oversight: Jim Furlow, Scott Martin

0702 J. Furlow conducts daily Tailgate Health & Safety briefing.

0715 Drill crews going to fill up water tanks.

0820 Drill rig mobilizing to MW-42 location (Mike Coleman, Driller). Hand augering MW-42 location prior to drilling.

0905 MW-42 location hand augered to depth of 5' bls (on 4th try).

0910 Setting up auger rig on MW-42 location.

0930 Begin augering/sampling on MW-42.

1210 Boring MW-42 completed to depth of 57'. Initial water level at 48.0' bls.

1300 Samples selected for sieve analysis: MW-42-1 (15'-17'); MW-42-2 (30'-32') MW-42-3 (45'-47') and MW-42-4 (55'-57'). No sample selected for Atterberg/moisture content testing.

1345 Water level in MW-42 measured at 45.7' bls; well to be set with screen at 44'-54'. T.D. of boring is 55'.

1355 Well screen (10' of 20 slot) and riser pipe steam cleaned on racks at well site.

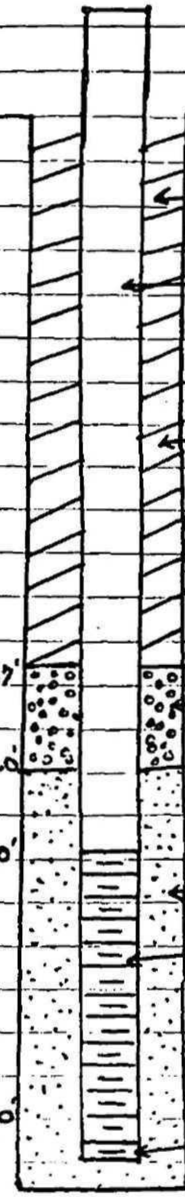
1400 Screen length: 10.03'; cap length: 0.30'; riser pipe lengths (from bottom up): 10.01', 10.00', 10.01', 10.01', 10.00' (total riser 50.03').

Drill crew pulling augers out of hole to replace plastic sand basket with wooden bottom plug.

Allied Industrial Park

MW-42

Installed 7/21/98
Stickup: 2.5' above ground
Driller: Mike Coleman



8" dia. borehole

Riserpipe lengths
(From bottom up):
10.01', 10.00', 10.01',
10.01', 10.00'

2" dia. PVC riser
pipe, flush joint

Grouted 7/23/98:
7 sacks of cement

Top of bentonite seal 38.7'

Baroid 3/8" bentonite
pellets, 1 5-gal. bucket

Top of FilterPack 41.0'

Top of screen 44.0'

Foster - Dixiana FX-50
filter sand, 5 1/2 bags.
(50-lb. bags)

Water Level at 45.76' bls
7/21/98

2" dia. PVC well screen,
20 slot (.020"), cut
slots, 10.03' long

Water Level at 45.56' bls
7/23/98

Bottom of screen 54.0'

T.D. of well 54.3'

2" dia. PVC screw-on cap
bottom cap length 0.30'

T.D. of Boring 55'

Note: Not
to Scale

July 21, 1998
1415 Wooden plug in bottom of augers; tripping augers in hole to install well.
1432 Begin installing well screen and riser pipe in well. Borehole diameter is 8 inches. T.D. of well is 55' bls.
1440 Begin installation of FX-50 filter sand.
1456 2 50-lb. bags of FX-50 installed. Top of filter pack at 48.5' bls.
1502 3 bags (total) of FX-50 installed. Top of filter pack at 44.0' bls.
1514 5½ bags (total) of FX-50 installed. Top of filter pack at 41.0' bls.
1525 1 5-gal. bucket of Baroid 3/8" bentonite pellets installed. Top of bentonite seal at 38.7' bls.
1530 Water added to well to hydrate bentonite pellets. Crew pulling augers out of hole to decon before moving to next location.
1545 J. Furlow to MW-38 location to observe drilling/sampling.
1728 MW-38 drilled/sampled to depth of 65'.
1740 All drilling / sampling ended for the day.
1800 J. Furlow off site.

J.W. Furlow
7/21/98

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J. W. [illegible] 7/22/98

July 22, 1998 Weather: Clear, hot

Project: AIP Monitoring Well Installation

Driller: Mike Coleman Helper: Steve Hanson

Technical Oversight: Jim Furlow

0700 Drill crews on site at SAIC field office

0710 J. Furlow conducts daily Tailgate Health & Safety briefing.

0720 Water level in MW-38 boring measured at 54.4' bls. Drill crew proceeding to ream boring to 64' and clean hole out.

0730 PID (Microsoft IS-3000) calibrated.

0740 Went to MW-38 and assisted Scott Martin in the well installation. Mike Coleman assisted the other driller and showed him how the well installation should be done.

0920 Went to offices of Politex, talked to Richard Shaw about installing monitoring wells on Politex property. Richard Shaw gave verbal permission for installation of all monitoring wells.

0955 Moving with Mike Coleman to MW-49 location, in front of Politex warehouse.

1010 Setting up on MW-49. Other rig moving to MW-57.

1013 MW-49 location hand augered to depth of 5', no obstructions.

1037 Begin drilling / sampling at MW-49.

1315 MW-49 drilled and sampled to depth of 43' bls. Breaking for lunch.

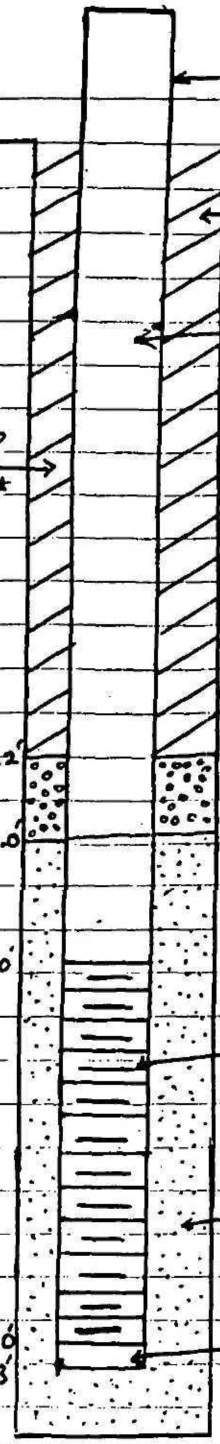
1300 Soil samples MW-49-1 (Atterberg Limits & moisture content) and MW-49-2 JWF (Grain Size Dist.) selected for shipment to laboratory.

MW-49

Installed 7/22/98

riser pipe stickup 2.5' ags.

Driller: Mike Coleman



8" dia. borehole

2" ID flush-joint pvc riser pipe

Riser pipe lengths (from bottom): 10.02', 10.03', 10.02', 10.01' (total of 40.8 before cutoff)

Grouted 7/23/98
6 sacks of cement

Top of bentonite seal 30.2'

Baroid 3/8" bentonite pellets, 1½ 5-gal. buckets

Top of Filter Pack 33.0'

Water level at 37.75' bls
7/22/98

Top of Screen 36.0'

Water level at 34.85' bls
7/23/98

2" dia. flush-joint PVC slotted well screen 0.020 slot, 10.02' long

Foster-Dixiana FX-50 filter sand, 5 bags (50-lb. bags)

Bottom of Screen 46.0'

T.D. of well 46.3'

2" dia. PVC bottom cap, 0.30' long

Note: Not to Scale

T.D. of Boring: 47.0'

July 22, 1998

1330 Water level in MW-49 boring measured at 37.75' bls. Screen to be set at 36-46' bls. Drilling/sampling to depth of 47'.

1406 MW-49 drilled/sampled to depth of 47'. Drill crew steam cleaning well screen and riser pipe. Lengths: bottom cap: 0.30'; Screen: 10.02'; riser pipe (from bottom): 10.02', 10.03', 10.02', 10.01' (total of 40.08' of riser pipe). Screen is 2" dia. pvc, 20 slot (0.020"), riser is 2" dia pvc.

1430 Drill crew begins installation of well. Well screen set at 36'-46' bls.

1503 5 bags (50-lb. bags) of FX-50 filter sand installed in well. Top of filter sand tagged at 33.0' bls.

1510 1 5-gal. bucket of Baroid 3/8" bentonite pellets installed in well. Top of bentonite at 31.4' bls.

1518 1½ 5-gal. buckets (Total) installed in well. Top of bentonite seal at 30.2' bls. Water added to well to hydrate bentonite.

1520 Driller pulling augers out of hole.

1540 Drill crew going to MW-57 to assist other crew in well installation.

1635 Begin installation of MW-57.

1720 MW-57 installed. See Logbook #3 for details of installation (Documented by Scott Martin).

1800 All personnel off site for the day.

J. W. Fazlout
7/22/98

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J. W. Furlow 7/23/98

July 23, 1998 Weather: Clear, hot
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helpers
Technical Oversight: Jim Furlow

0700 All personnel on site except for Mike Coleman
0704 J. Furlow conducts daily Tailgate Health & Safety briefing.
0710 Microtip IS-3000 PID calibrated.
Waiting for Mike Coleman to get back from Macon with bags of Quick-Gel.
0730 Scott Martin and drill crew mobilizing to MW-48 location.
0750 Mike Coleman back with Quick-Gel.
0810 Mobilizing to MW-38 to grout well.
0814 Water level in MW-38 measured at 54.30' bls. Crew mixing grout.
0828 First batch of grout mixed: 4 sacks of Type I Portland Cement, 28 gal. of potable water, 12 lb. Quick-Gel. Grout weight is 13.2 lb/gal.
0830 First batch of grout pumped.
0838 Second batch of grout mixed and pumped: 3 sacks of Type I Portland Cement, 21 gal. of potable water, 9 lb. Quick-Gel. Grout weight is 13.4 lb./gal. Grout at ground surface
0840 Crew cleaning up equipment.
0845 Drill crew at MW-42. Water level measured at 45.56' bls. 7/23/98
0858 First batch of grout ~~&~~ JWF mixed and pumped in MW-42. Mix is 4 sacks of cement, 28 gal. water, 12 lb. Quick-Gel. Grout weight is 13.3 lb/gal.

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J.W. Zarlow 7/23/98

July 23, 1998

0905 Second batch of grout mixed and pumped: 3 sacks of cement, 21 gal. water, 9 lb. Quick-Gel. Grout weight 13.3 lb/gal. Grout up to 1 ft. below ground surface.

0910 Moving to MW-49

0914 Water level in MW-49 measured at 34.85' bls.

0927 First batch of grout mixed and pumped into MW-49: 4 sacks of cement, 28 gal. water, 12 lb. Quick-Gel. Grout weight 13.5 lb/gal.

0935 Second batch of grout mixed and pumped into MW-49: 2 sacks of cement, 14 gal. water, 6 lb. Quick-Gel. Grout weight 13.2 lb./gal. Grout rose to within 2 feet of ground surface.

0940 Moving to MW-57.

0942 Water level in MW-57 measured at 34.00' bls.

0954 First batch of grout mixed: 5 sacks of cement, 35 gal. water, 15 lb. Quick-Gel. Grout weight 13.7 lb/gal.

0956 First batch of grout pumped. Grout rose to within 1 foot of ground surface. Drill crew going to flush out pump and get more water.

1026 Setting up on MW-47 location.

1045 Begin drilling / sampling on MW-47.

1225 MW-47 drilled and sampled to a depth of 44'. Water level measured at 41'; not a reliable measurement. Breaking for lunch.

1310 Beginning hard rain.

1330 Water level measured at 40.9' bls; not accurate. Split spoons became wet at 34'.

1400 Driller pulling augers up in hole for measuring water level again. Augers may have

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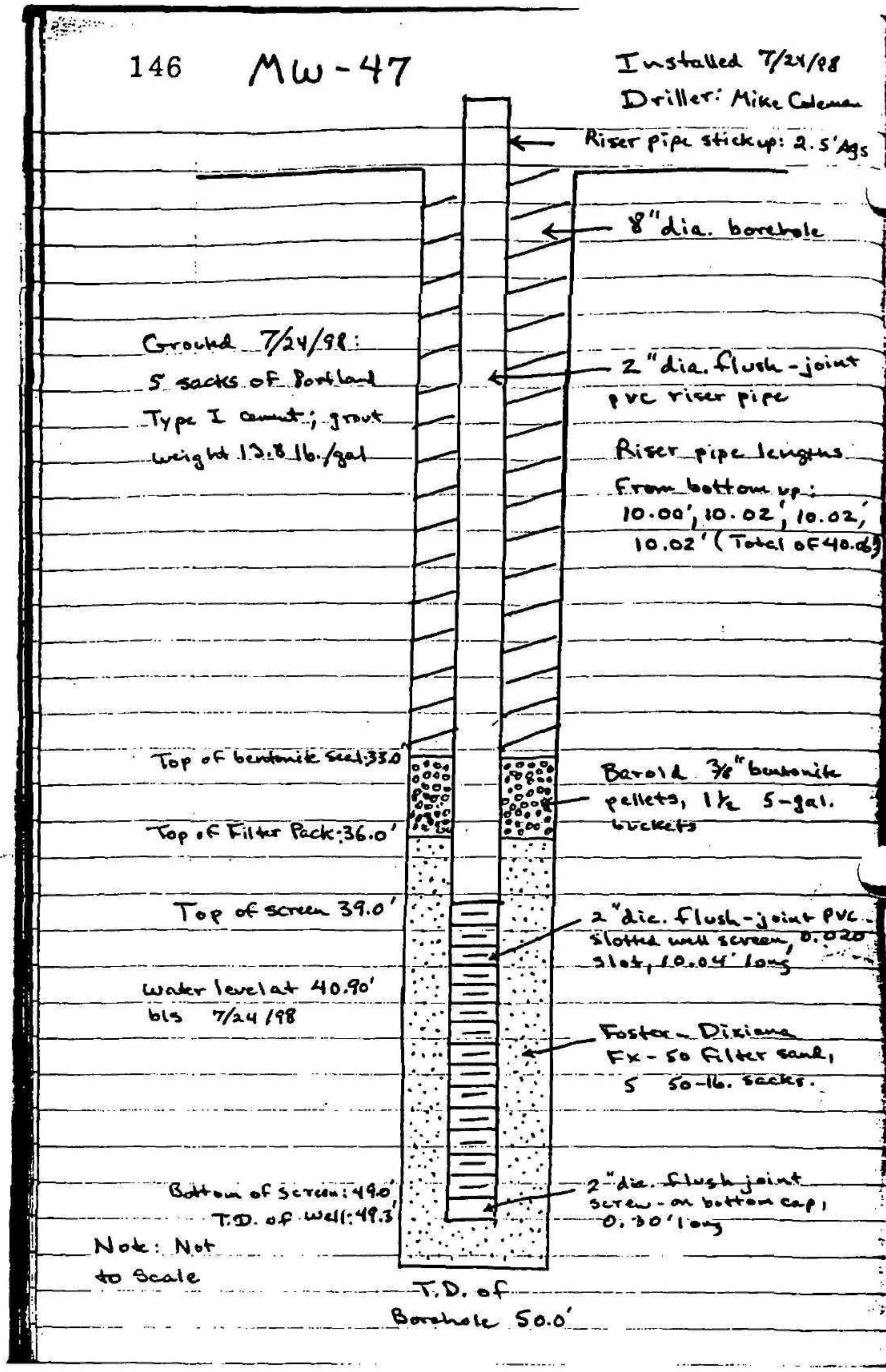
J.W. Farlow 7/23/98

July 23, 1998
been plugged up, causing inaccurate level.
1500 Water level still at 41' bls. Drilling / sampling to depth of 50' for temporary well installation to determine true depth to water.
1523 MW-47 drilled and sampled to depth of 50' bls. Crew preparing to install temporary well, with screen set at 39'-49'.
1534 Crew steam cleaning well screen and riser pipe. Well screen: 2" dia. flush-joint PVC, 0.020 slot, 10.04' long. Cap is 0.30' long. Riser pipe: 2" dia. flush joint PVC, lengths from bottom are: 10.00', 10.02', 10.02', 10.02' (total of 40.06' of riser).
1608 Temporary well set with screen at 39'-49', 3 bags of FX-50 filter sand in well, temporary top of filter sand at 40' bls. Driller will adjust depth of screen tomorrow based on water level measurement.
1615 Going to MW-56 to assist Scott Martin.
1705 Work ended at MW-56 for the day. Temporary well installed with screen set at 31'-41'.
1800 All personnel off site.

J. W. Furlow
7/23/98


146
MW-47
Installed 7/24/98
Driller: Mike Coleman
Riser pipe stickup: 2.5' ags
8" dia. borehole
Grouted 7/24/98:
5 sacks of Portland
Type I cement; grout
weight 13.8 lb./gal
2" dia. flush-joint
pvc riser pipe
Riser pipe lengths
From bottom up:
10.00', 10.02', 10.02',
10.02' (Total of 40.06')
Top of bentonite seal: 33.0'
Baroid 3/8" bentonite
pellets, 1½ 5-gal.
buckets
Top of Filter Pack: 36.0'
Top of screen 39.0'
2" dia. flush-joint PVC
slotted well screen, 0.020
slot, 10.04' long
Water level at 40.90'
bls 7/24/98
Foster-Dixiana
FX-50 filter sand,
5 50-lb. sacks.
Bottom of Screen: 49.0'
T.D. of Well: 49.3'
2" dia. flush joint
screw-on bottom cap,
0.30' long
Note: Not
to Scale
T.D. of
Borehole 50.0'

July 24, 1998 Weather: Cloudy, hot
Project: AIP Monitoring well installation
Subcontractor: Alliance Environmental
Driller: Mike Coleman Helper: Steve Hanson
Technical oversight: Jim Furlow

0700 All personnel on site.
0705 J. Furlow conducts daily Tailgate Health & Safety Briefing.
0715 Microtip IS-3000 PID calibrated.
0725 Water level in MW-47 measured at 40.9' bls. Screen set at 39.0'-49.0'. Decision made to leave screen where it is and complete installation of filter pack (3 bags of FX-50 installed 7/23/98).
0735 Resume installation of filter pack.
0743 Top of filter pack at 36.0' bls. Total of 5 bags of Foster-Dixiana FX-50 filter sand installed in MW-47.
0748 1 5 gal. bucket of Baroid 3/8" bentonite pellets installed. Top of bentonite at 33.7' bls
0750 1½ (Total) 5 gal. buckets of Baroid 3/8" bentonite pellets installed. Top of bentonite seal at 33.0' bls. Driller adding water to hydrate bentonite.
0830 Drill crew off MW-47 to decon drill rig and tools
0938 Drill crew setting up on MW-48 to grout well.
0953 Grout batch mixed and pumped: 5 94-lb sacks of Type I Portland Cement, 35 gal. potable water, 15 lb. bentonite. Grout weight is 13.7 lb./gal. Grout rose to within 5 feet of ground surface. Moving to MW-47 to grout.

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J. W. Furlow 7/24/98

July 24, 1998

1008 MW-47 grouted up to within 5 feet of ground surface. Groutmix was 5 sacks of Portland Type I cement, 35 gal. potable water, 15 lbs. Quick-Gel bentonite. Grout weight was 13.8 lb./gal.

1010 Moving to MW-56 to grout.

1023 MW-56 grouted to ground surface. Grout mix: 4 sacks of cement, 28 gal. of water, 12 lb. Quick-Gel. Grout weight was 13.2 lb./gal. Crew cleaning out equipment. Other crew moving drums of well cuttings to decon / staging area.

1220 Monitor well locations: MW-28, MW-31, MW-32, MW-33, MW-34, MW-29, and MW-30, staked for drilling. Drill crews off site to Aiken.

1230 J. Furlow off site.

J. W. Furlow
7/27/98

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J. W. Farlow 7/27/98

July 27, 1998 Weather: Cloudy, hot

Project: AIP Monitoring Well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: Mike Coleman; Helper: Richard Mooney

Technical Oversight: Jim Furlow

0655 J. Furlow on site

0700 Microtip IS-3000 PID calibrated.

0730 Daily Tailgate Health & Safety briefing conducted. One drill crew is one man short; Mike Coleman called Alliance and a replacement is on the way.

0800 George Wilkerson and Scott Martin mobilizing B-61 drill rig to MW-28 location in NW corner of AIP.

1150 Monitor well MW-28 installed (see Logbook #3 for details). J. Furlow and M. Coleman waiting for Alliance helper from Aiken to arrive.

1314 Alliance truck with Richard Mooney arrives on site. Mobilizing to MW-31 location.

1340 Drill rig on MW-31 location.

1355 Begin drilling/sampling on MW-31.

1425 All drilling shut down due to approaching thunderstorm with lightning. Depth of MW-31 is 14'. Second drill rig shut down also.

1517 Storm has passed, raining lightly. All crews going back out to resume drilling.

1620 Water level measured at 27.5' bls in MW-31 boring.

1622 Drilling/sampling stopped for the day. Rope on cathead is wet, causing it to grab, creating very unsafe condition. Will resume drilling/sampling tomorrow morning. Present depth of boring is 30'.

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J.W. Furlow 7/27/98

July 27, 1998

1730 All personnel off site for the day.

J. W. Furlow
7/27/98

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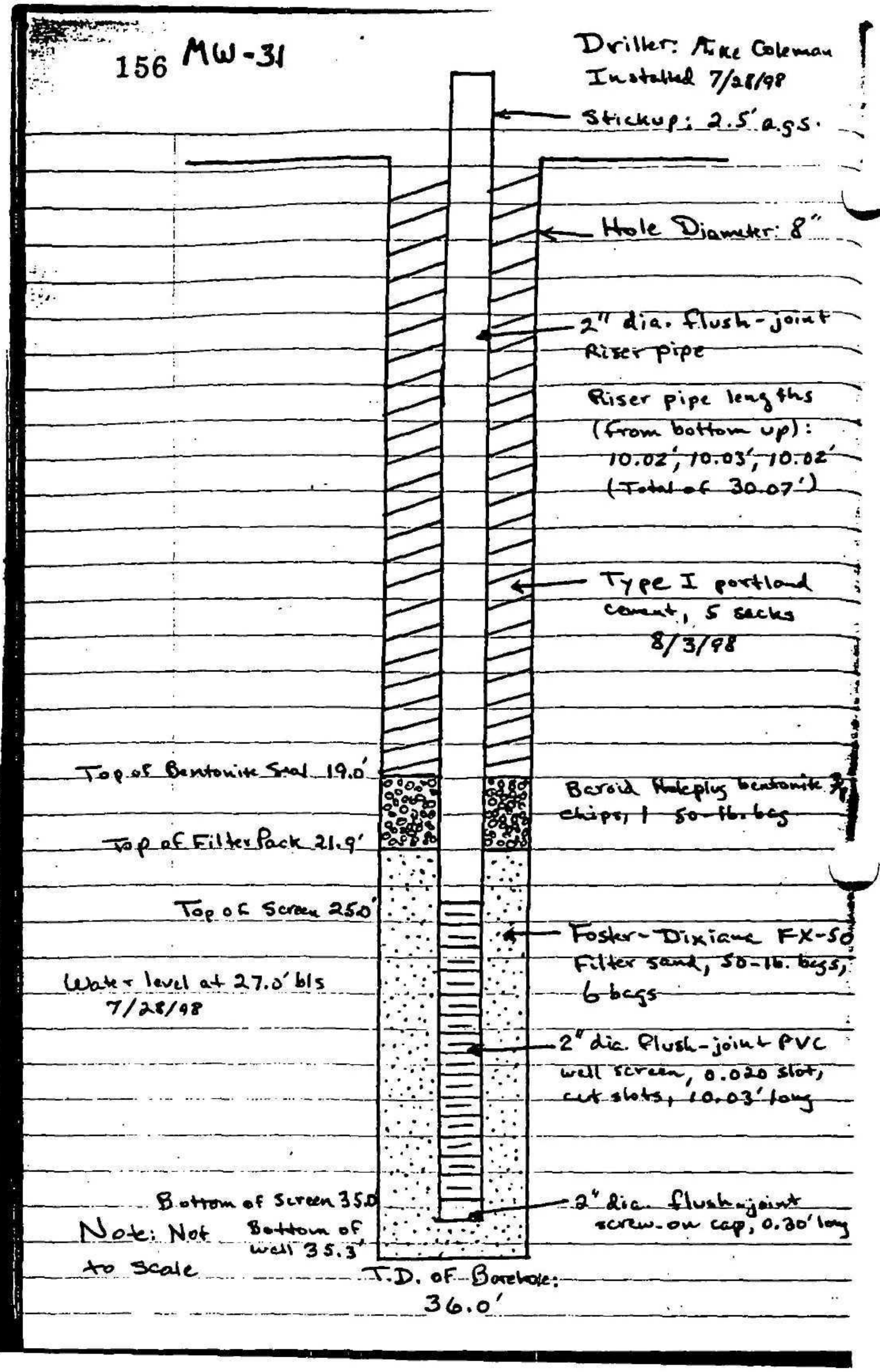
J.W. Farlow 7/28/98

July 28, 1998 Weather: Cloudy, hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Richard Mooney

0655 Drill crews on site
0700 Microtip IS-3000 PID calibrated.
0710 Conducted daily Tailgate Health and Safety briefing.
0725 J. Furlow at MW-31 boring. Water level in boring measured at 27.00' bls. Well screen to be installed at 25'-35'. Drill crew picking up filter pack material (FX-50) well screen (10 ft of 20 slot) and riser pipe (2" PVC).
0743 Resuming drilling from depth of 30' bls.
0805 Drilling shut down due to approaching thunderstorm with lightning. Boring depth 34' bls.
0844 Rain slacking off, thunderstorms moving out of area. Resuming drilling.
0850 MW-31 drilled to total depth of 36' bls. Sampling stopped at 34' due to wet rope grabbing on cathead.
0900 Well assembly lengths: bottom cap: 0.30'; well screen (2" PVC, 20 slot), 10.03'; riser pipe (from bottom): 10.02', 10.03', 10.02' (total 30.07').
0903 Raining again.
0908 Driller putting augers back in hole after installing wooden plug.
0909 Begin installation of MW-31.
0912 Well screen and riser pipe installed. Screen set at 25.0'-35.0'
0945 6 50-lb. bags of Foster-Dixiana FX-50 installed in well. Top of filter pack at 21.9' bls.
0955 1 50-lb. bag of Baroid Holeplug 3/8"


156 MW-31
Driller: Mike Coleman
Installed 7/28/98
Stickup: 2.5' a.g.s.
Hole Diameter: 8"
2" dia. flush-joint
Riser pipe
Riser pipe lengths
(from bottom up):
10.02', 10.03', 10.02'
(Total of 30.07')
Type I portland
cement, 5 sacks
8/3/98
Top of Bentonite Seal 19.0'
Baroid Holeplug bentonite 3/8
chips, 1 50-lb. bag
Top of Filter Pack 21.9'
Top of Screen 25.0'
Foster-Dixiana FX-50
Filter sand, 50-lb. bags,
6 bags
Water level at 27.0' bls
7/28/98
2" dia. flush-joint PVC
well screen, 0.020 slot,
cut slots, 10.03' long
Bottom of Screen 35.0
2" dia. flush-joint
screw-on cap, 0.30' long
Bottom of
well 35.3'
Note: Not
to Scale
T.D. of Borehole:
36.0'

July 28, 1988

chips installed in well. Top of bentonite seal is 19.0' bls. Water added to hydrate bentonite.

1010 Driller going to help other drill crew retrieve 20' of hollow-stem augers dropped in hole.

1050 Augers out of MW-29 boring. Drill crew deconning tools.

1210 Drill crew setting up on MW-37 location.

1225 Begin drilling / sampling on MW-37.

1400 Water level measured at 30.3' bls in MW-37.

1415 MW-37 borehole drilled to T.D. of 39' bls.

1430 Begin installation of well. Screen set at 28'-38' bls. Screen length: 10.00'; 2" dia. flush joint PVC, cut slots, 0.020 slot. Cap length: 0.30', 2" dia PVC. Riser pipe lengths (from bottom): 10.01', 10.01', 10.01' (Total 30.03'). Riser is 2" dia flush-joint PVC.

1435 Begin installation of filter pack (Foster-Dixiana FX-50).

1455 Top of filter pack at 25.0' bls. Six 50-lb bags of Foster-Dixiana FX-50 installed.

1500 Top of bentonite seal at 21.6' bls. 1½ 50-lb. bags of ~~Foster Dixiana~~ JWF 7/28/88 Baroid Hole Plug 3/8" chips installed.

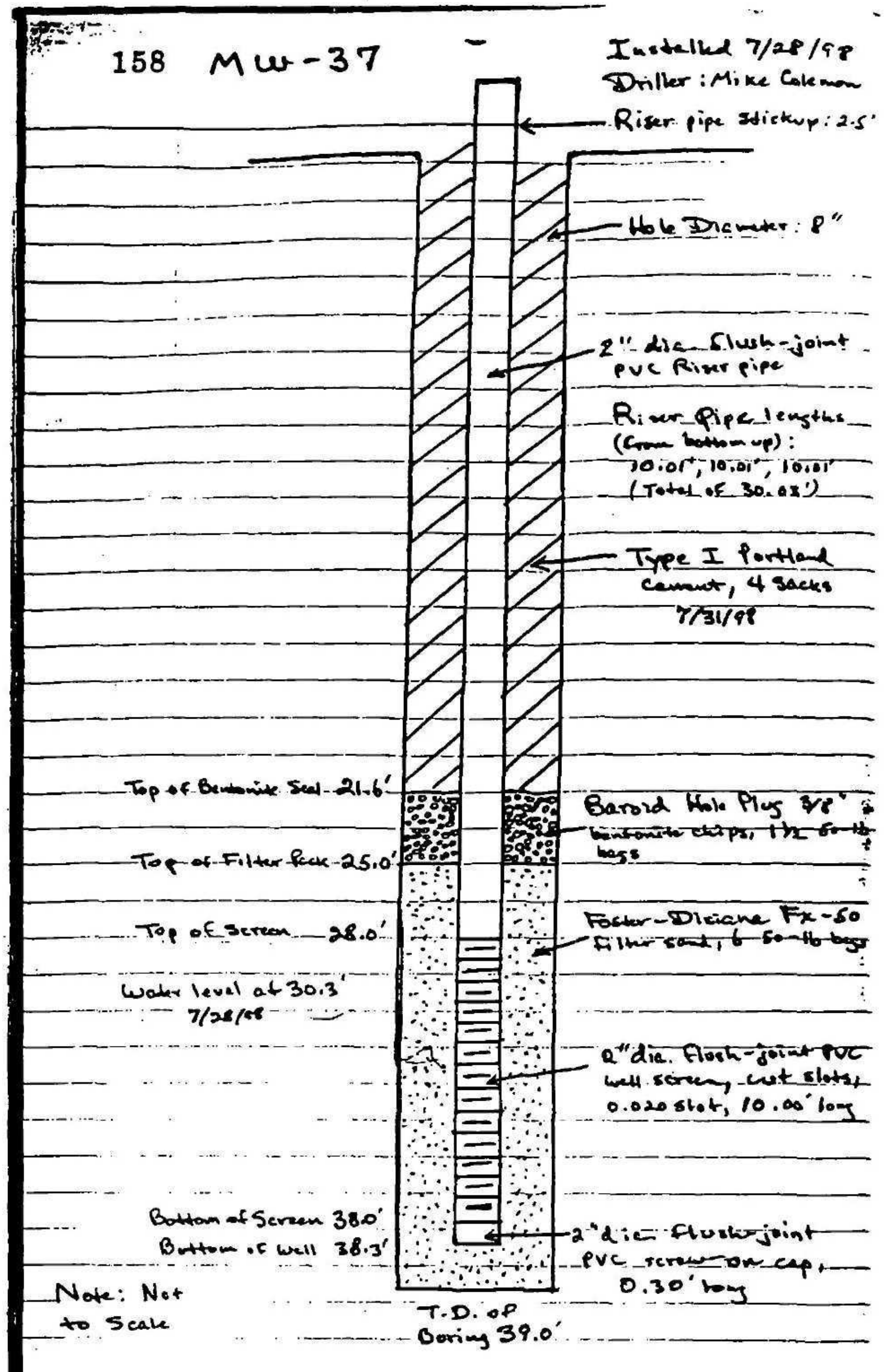
1510 Water added to well to hydrate bentonite chips.

1525 J. Furlow to SAIC field office.

1720 J. Furlow off site for the day.

J. W. Furlow 7/28/88

158 MW-37



Installed 7/28/98
Driller: Mike Coleman
Riser pipe stickup: 2.5'
Hole Diameter: 8"
2" dia. flush-joint PVC Riser pipe
Riser pipe lengths (from bottom up): 10.01', 10.01', 10.01' (Total of 30.03')
Type I Portland cement, 4 sacks 7/31/98
Top of Bentonite Seal 21.6'
Baroid Hole Plug 3/8" bentonite chips, 1½ 50-lb bags
Top of Filter Pack 25.0'
Top of Screen 28.0'
Foster-Dixiana FX-50 filter sand, 6 50-lb bags
Water level at 30.3' 7/28/98
2" dia. flush-joint PVC well screen, cut slots, 0.020 slot, 10.00' long
Bottom of Screen 38.0'
Bottom of Well 38.3'
2" dia. flush-joint PVC screw-on cap, 0.30' long
Note: Not to Scale
T.D. of Boring 39.0'

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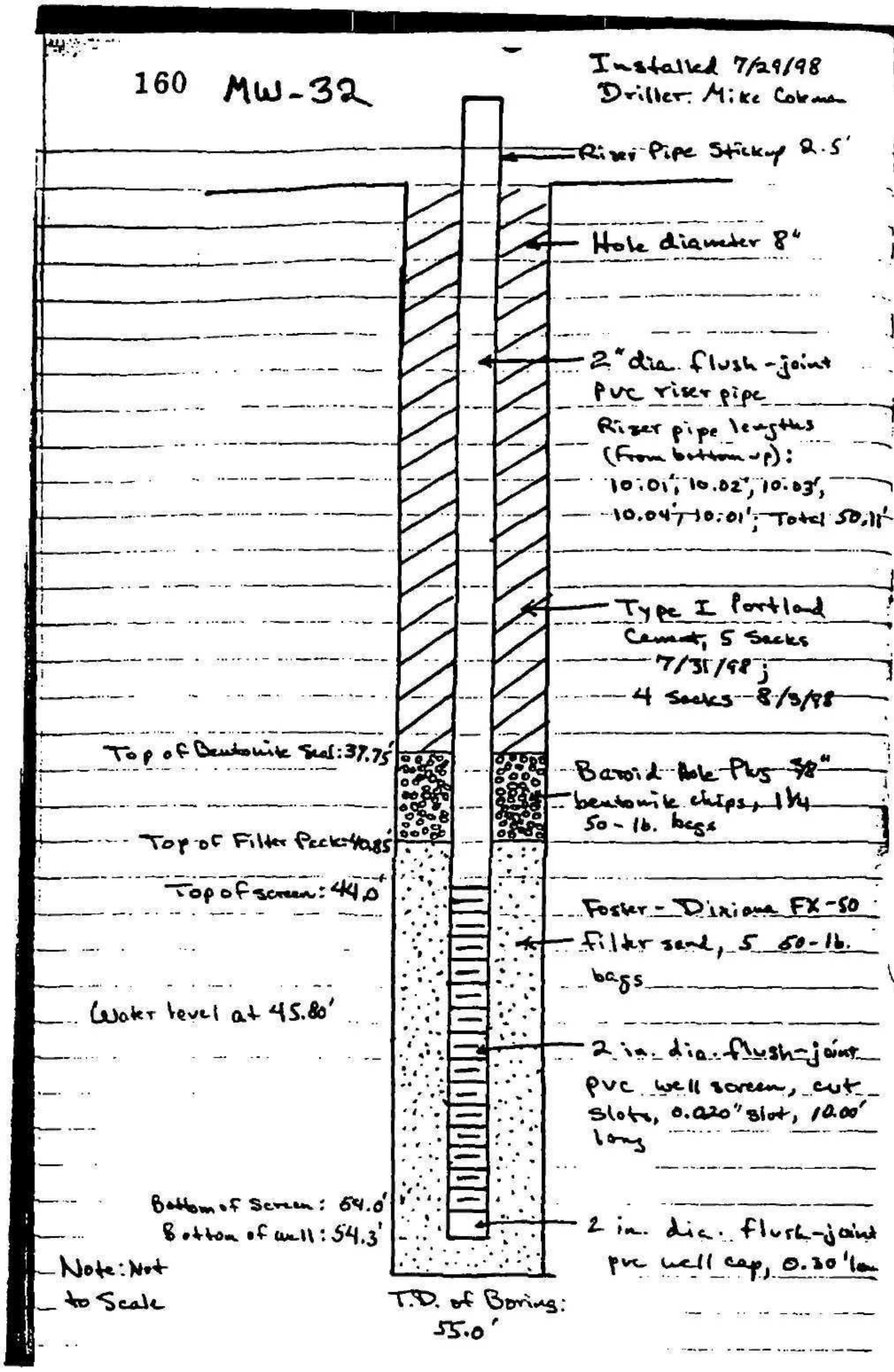
J.W. Harlow 7/25/98


160
MW-32
Installed 7/29/98
Driller: Mike Colema
Riser Pipe Stickup 2.5'
Hole diameter 8"
2" dia. flush-joint PVC riser pipe
Riser pipe lengths (From bottom up): 10.01', 10.02', 10.03', 10.04', 10.01'; Total 50.11'
Type I Portland Cement, 5 Sacks 7/31/98; 4 Sacks 8/3/98
Top of Bentonite Seal: 37.75'
Baroid Hole Plug 3/8" bentonite chips, 1 1/4 50-lb. bags
Top of Filter Pack: 40.85'
Top of screen: 44.0'
Foster-Dixiana FX-50 filter sand, 5 50-lb. bags
Water level at 45.80'
2 in. dia. flush-joint PVC well screen, cut slots, 0.020" slot, 10.00' long
Bottom of Screen: 54.0'
Bottom of well: 54.3'
2 in. dia. flush-joint pvc well cap, 0.30' long
Note: Not to Scale
T.D. of Boring: 55.0'

July 29, 1998 Weather: Cloudy, hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman; Helper: Richard Mooney
Technical Oversight: Jim Furlow

0700 All personnel on site.
0705 J. Furlow conducts daily Tailgate Health and Safety briefing.
0718 Microtip IS-3000 calibrated.
0720 Mobilizing drill rig to MW-32.
0725 Hand augering MW-32 to depth of 5 feet to check for underground obstructions.
0746 No obstructions encountered; setting drill rig up on MW-32
0813 Begin drilling/sampling on MW-32.
1050 MW-32 drilled/sampled to depth of 55'. Water level at 45.80' bls. Screen to be set at 44'-54' bls.
1136 Crew preparing to install well in MW-32 boring. Using 2" dia. PVC bottom cap 0.30' long, 2" dia. PVC screen 10.00' long (0.020 slot, cut slots), 2" dia PVC riser pipe. Riser pipe lengths from bottom up are: 10.01', 10.02', 10.03', 10.04', 10.01', total of 50.11'.
1140 Bottom cap, screen and riser pipe installed in well. Begin installation of filter pack.
1204 Top of filter pack tagged at 40.85' bls. Five bags (50-lb. bags) of Foster-Dixiana FX-50 installed.
1210 1¼ bags of Baroid Hole Plug installed (50-lb. bags). Top of bentonite seal tagged at 37.75' bls.
1223 Water added to hole to hydrate bentonite.

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J. W. Fowler 7/29/98

July 29, 1998

1227 Drill crew demobilizing off MW-32 to decon tools.

1425 Mobilizing to MW-34 location, just south of Admin. Bldg.

1430 Hand augering to depth of 5' for underground obstructions.

1500 MW-34 hand augered to depth of 5'; no underground obstructions encountered.

1525 Begin drilling / sampling on MW-34.

1540 Drill bit hit concrete at depth of 7 feet. Moving rig 5' north in attempt to get off concrete.

1555 Hit concrete again at depth of 7'. Moving north another 5'.

1700 Drilling / sampling of MW-34 stopped at depth of 36', so that R. Mooney can go to Aiken and pick up filter pack sand and 0.030 slot well screens. Drill crew off site.

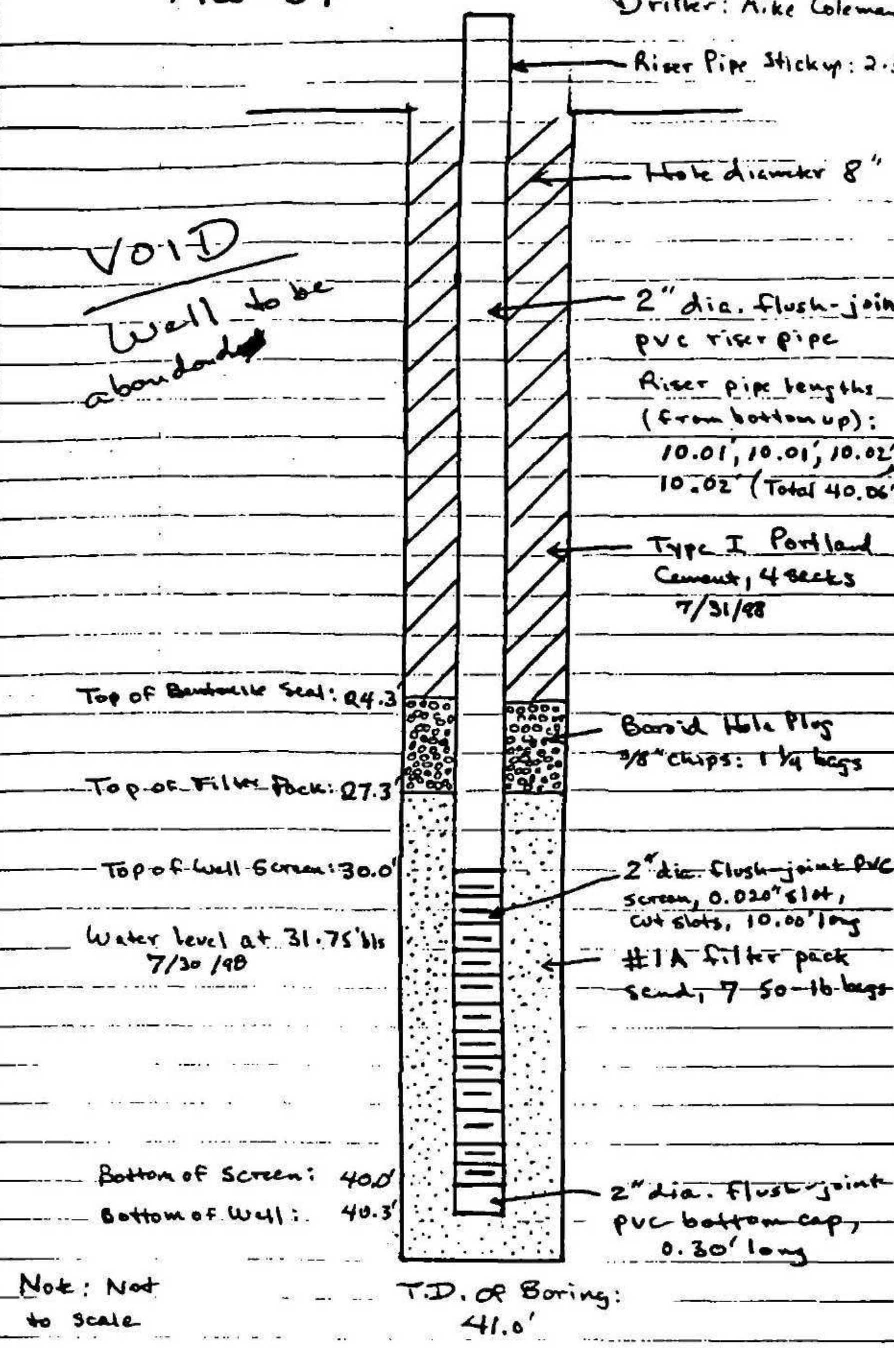
1745 J. Furlow off site for the day.

J.W. Furlow 7/29/98

MW-34

Installed 7/30/98
Driller: Mike Coleman

VOID
Well to be abandoned



July 30, 1998 Weather: Cloudy

Project: AIP Monitor Well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: Mike Coleman; Helper: Richard Mooney

Technical Oversight: Jim Furlow

0700 All personnel on site, except for R. Mooney

0705 J. Furlow conducts daily Health & Safety Tailgate briefing.

0710 Microtip IS-3000 PID calibrated

0745 R. Mooney and N. Coleman arrive on site with additional well screens (0.030 slot) and filter pack #1A and #2.

0750 J. Furlow and M. Coleman go to MW-30 to deliver screen and filter pack.

0820 Water level in MW-34 boring measured at 31.75' bls. Screen to be set at 30'-40'. Continuing to drill/sample from 36' bls.

0840 MW-34 drilled/sampled to depth of 40'.

0925 Sieve analysis shows #1A filter pack and 20 (0.020") slot screen. Bottom cap length: 0.30' (2" pvc); Screen length: 10.00' (0.020 slot) (2" pvc). Riser pipe lengths: (from bottom up) 10.01', 10.01', 10.02', 10.02' (total 40.06').

0936 Well screen and riser pipe installed in well.

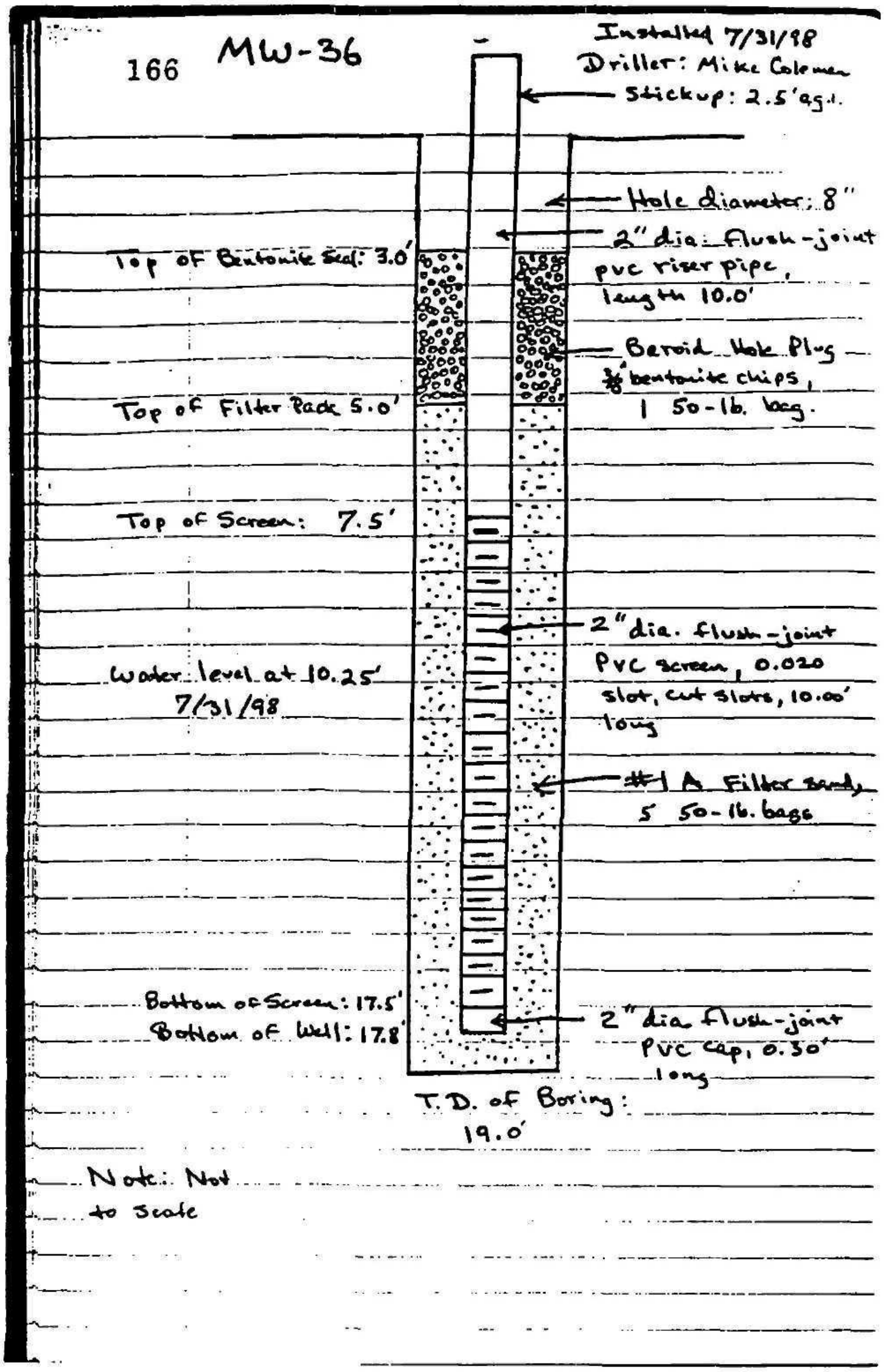
0938 Begin installation of filter pack (#1A) sand.

1000 Filter pack top measured at 27.3' bls. Seven 50-lb. bags of #1A filter sand installed.

1010 1 1/4 50-lb bags of Baroid bentonite chips (3/8") installed. Top of bentonite seal tagged at 24.3' bls.

1015 Water added to hole to hydrate bentonite.

1017 Drill crew tripping out of well to decon tools.


166
MW-36
Installed 7/31/98
Driller: Mike Coleman
Stickup: 2.5' a.g.l.
Hole diameter: 8"
2" dia. flush-joint pvc riser pipe, length 10.0'
Top of Bentonite Seal: 3.0'
Beroid Hole Plug 3/8" bentonite chips, 1 50-lb. bag.
Top of Filter Pack 5.0'
Top of Screen: 7.5'
2" dia. flush-joint PVC screen, 0.020 slot, cut slots, 10.00' long
Water level at 10.25' 7/31/98
#1 A Filter sand, 5 50-lb. bags
Bottom of Screen: 17.5'
Bottom of Well: 17.8'
2" dia. flush-joint PVC cap, 0.30' long
T.D. of Boring: 19.0'
Note: Not to scale

July 30, 1998

7/30/98 JWF

1040 Drill rig off to decon ~~tools~~ drill tools

1255 Drill tools deconned, moving to MW-36.

1300 Setting up on MW-36

1322 Begin drilling / sampling on MW-36

1425 MW-36 drilled/sampled to depth of 15 feet. Water level measured at 7.65' bls. Sample given to W. Malony to run sieve analysis on.

1520 W. Malony recommends 0.020 slot screen and #1A filter pack. Drill crew going to get materials.

1525 Raining hard, with lightning.

1555 Drill crew back with well materials; still raining hard off and on, with lightning. Bottom cap length: 0.30' (2" pvc). Screen length: 10.00', Slot size 0.020", cut slots. Riser pipe length 10.00'. Screen to be set at 5.5' to 15.5' bls. MW-36 boring drilled to depth of 16.5'.

1650 Still raining hard, with frequent lightning. Both drill crews off site for the day. Unable to do any more work because of rain and lightning.

1730 J. Furlow off site for the day

J. W. Furlow 7/30/98

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J. W. Fuller 7/31/98

July 31, 1998 Weather: Cloudy, warm

Project: AIP Monitor well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: Mike Coleman Helper: Nathan Coleman

Technical Oversight: Jim Furlow

0655 J. Furlow on site

0700 Microtip IS-3000 PID calibrated.

0714 Conducted Daily Health & Safety Tailgate meeting.

0725 Drill crew to MW-36

0735 Water level in MW-36 boring measured at 10.25' bls. Water level was at 7.65' bls yesterday afternoon. Drilling deeper so that well screen can be set at 8'-18' bls.

0757 MW-36 boring drilled to depth of 19'.

0804 Well screen and riser pipe installed in well. Screen set at 8.0'-18.0' bls. Screen is cut slot, 0.020 slot width.

0805 Begin installation of filter pack, #1A.

0830 Sand bridging in augers, sandlocking screen in auger. Driller pulling screen and riser to start over.

0904 Reattempting to install well and filter pack.

1000 MW-36 well screen, riser pipe, filter pack and bentonite seal installed after repeated tries. Well screen is set from 7.5'-17.5' bls. Filter pack is from bottom of hole (at 19') to 5.0' bls (5 50-lb bags of #1A sand). Bentonite seal is from ~~5.0~~ JWF 7/31/98 5.0' to 3.0' bls (Baroid Hole Plug 3/8" chips, 1 50-lb bag). See P. 166 for well construction diagram.

1020 Demobilizing off MW-36 to get cement for grouting wells.

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J. W. Fulow 7/31/98

July 31, 1998

1035 Moving to MW-28 to grout well.

1040 Flatbed truck stuck in soft ground; unable to get to MW-28.

1045 Moving to MW-30 to grout.

1103 MW-30 grouted up to ground surface. Grout mix was 5 94-lb. sacks of Portland Type I cement, 35 gal. of water, 15 lb. of bentonite. Grout weight was 13.9 lb/gal. Moving to MW-34 to grout.

1126 MW-34 grouted to within 1 foot of ground surface. Grout mix was 4 94-lb sacks of cement, 28 gal. of water, 12 lb. of bentonite. Grout weight was 14.7 lb./gal. Moving to MW-32

1145 MW-32 partially grouted up (to within about 10 feet of ground surface). Grout mix: 5 94-lb sacks of cement, 35 gal. of water, 15 lb. of bentonite. Grout weight was 14.7 lb/gal. Moving to MW-37.

1205 MW-37 grouted up to ground surface. Grout mix was 4 94-lb. sacks of cement, 28 gal. of water, 12 lb. bentonite. Grout weight was 13.6 lb/gal.

1210 Drill crew to decon pad to leave rig. Alliance Aiken employees required to be in Aiken at 4 p.m for company safety meeting.

1237 Alliance Aiken employees leave for safety meeting.

1300 J. Furlow & S. Martin off site.

J. W. Furlow 7/31/98

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J.W. Forlow 8/3/98

August 3, 1998 Weather: Clear, warm

Project: AIP Monitor Well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: Mike Coleman; Helper: Nathan Coleman

Technical Oversight: Jim Furlow

0715 All personnel on site

0717 J. Furlow conducts daily Tailgate Health and Safety Meeting.

0735 Microtip IS-3000 calibrated.

0745 Driller and crew off to decon drill rig and get pallet of cement.

0940 Drill crew ready to grout up wells. Mobilizing to MW-29.

1000 Grout mixed and pumped into MW-29: 5 sacks of Type I Portland cement, 15 lb. bentonite, 35 gal. of water. Grout weight 13.5 lb./gal.

1002 Mixing second batch of grout: 4 sacks of cement, 12 lb. bentonite, 28 gal. water.

1008 Grout weight 13.4 lb./gal. Grout pumped in MW-29 to within 5 feet of ground surface.

1015 At MW-28. Mixing grout.

1020 MW-28 grouted. Mix was 1 sack of cement, 3 lb. bentonite, 7 gal. of water. grout rose to within 1½ feet of ground surface.

1037 At MW-31. Mixing grout. Grout mix: 5 sacks of cement, 15 lb. bentonite, 35 gal. of water. Grout weight 14.5 lb./gal. MW-31 grouted up to ground surface.

1055 At MW-35. Grout mix: 5 sacks of cement, 15 lb bentonite, 35 gal. of water. Grout weight 13.4 lb./gal. Grout pumped.

Going to SAIC field office to call Alliance - Nathan Coleman backed Mobile B-59 into

[redacted]

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J. W. Furlow 8/3/98

8/3/98 JWF August 3, 1998

side of T. Furlow's pickup truck. No injuries, but bed of truck was smashed in badly.

1120 Alliance says to file police report for insurance claim. Police called to come to scene.

1245 Police officer on scene, preparing accident report.

1305 Police report completed, officer leaving. Mike Coleman calling Alliance to discuss accident.

1335 Back at MW-29 to top the well off.

1340 Grout mixed: 4 sacks of cement, 12 lb. of bentonite, 28 gal. of water. Grout weight 13.3 lb./gal. Grout pumped, rose to ground surface.

1358 At MW-34.

1405 MW-34 topped off with 1 sack of cement.

1410 At MW-32. Grout mixed: 4 sacks of cement, 12 lb. bentonite, 28 gal. of water. Grout weight 13.4 lb./gal. Grout pumped, rose to ground surface.

1423 At MW-35. Mixing grout: 3 sacks of cement, 9 lb. of bentonite, 21 gal. of water. Grout weight 13.3 lb./gal. Grout pumped, rose to ground surface.

1438 At MW-38. Mixing grout: 2½ sacks of cement, 7 lb. of bentonite, 18 gal. of water. Grout rose to within 1 foot of ground surface.

1502 At MW-42. MW-42 topped off with grout left over from MW-35.

1600 MW-49, MW-57, MW-48 all topped off with minor quantities of grout mixed in a bucket.

1610 8/3/98 JWF At MW-47. Mixing grout: 2½ sacks of cement, 7 lb. bentonite, 18 gal. of water. Grout weight 13.2 lb./gal. Grout pumped, rose

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J. W. Zwelow 8/3/98

August 3, 1998
to ground surface.
1635 At MW-56. 1 sack of cement mixed, grout up to within 1 foot of ground surface.
1640 At MW-40. Grout mixed: 4 sacks of cement, 12 lb. bentonite, 28 gal. of water. Grout weight 13.2 lb./gal. Grout rose to ground surface.
1655 MW-45 restaked for well location, as requested by P. Albenesius.
1730 J. Furlow off site.

J. W. Furlow
8/3/98

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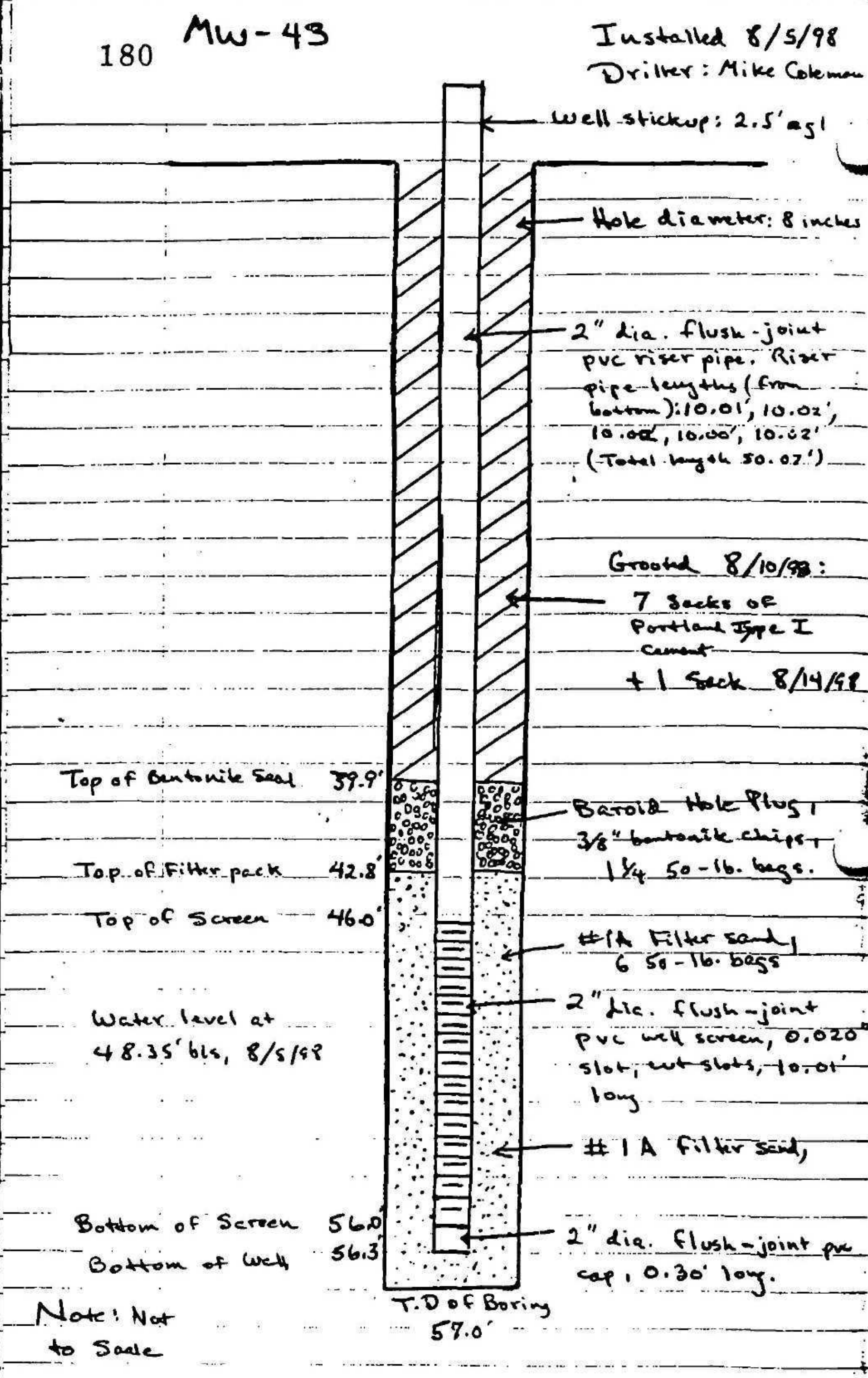
J. W. Farlow 8/4/98

August 4, 1998 Weather: Clear, warm
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: None today
Technical Oversight: Jim Furlow

0700 All personnel on site, except for driller Mike Coleman, who had to go to Aiken/Augusta to renew his commercial drivers' license today. Only one drill rig operating today. Scott Martin is oversight on that rig.
0710 J. Furlow conducts daily Health & Safety Tailgate briefing.
0720 One crew off to install MW-55, other crew off to get cement to pour pads.
0930 Went to MW-30 to observe pad installation.
1000 Went to MW-45 to talk to Scott Martin about location of MW-39.
1700 MW-55 and MW-45 installed. Drill crew set up on MW-39. Pads installed on MW-30, MW-32, MW-31, MW-35.
1715 All personnel off site for the day.

J. W. Furlow
8/4/98

A254


MW-43
Installed 8/5/98
Driller: Mike Coleman
Well stickup: 2.5' agl
Hole diameter: 8 inches
2" dia. flush-joint pvc riser pipe. Riser pipe lengths (from bottom): 10.01', 10.02', 10.02, 10.00', 10.02' (Total length 50.07')
Grouted 8/10/98: 7 sacks of Portland Type I Cement + 1 Sack 8/14/98
Top of Bentonite Seal 39.9'
Baroid Hole Plug, 3/8" bentonite chips, 1 1/4 50-lb. bags.
Top of Filter pack 42.8'
Top of Screen 46.0'
#1A Filter sand, 6 50-lb. bags
2" dia. flush-joint pvc well screen, 0.020" slot, cut slots, 10.01' long
Water level at 48.35' bls, 8/5/98
#1A Filter sand,
Bottom of Screen 56.0'
Bottom of Well 56.3'
2" dia. flush-joint pvc cap, 0.30' long.
T.D of Boring 57.0'
Note: Not to Scale

August 5, 1998 Weather: Clear, warm
Project: ALP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helpers: Nathan Coleman

0700 All personnel on site
0705 Microtip IS-3000 PID calibrated
0712 J. Furlow conducts daily Health and Safety Tailgate meeting.
0740 Setting up on MW-43 location.
0755 Begin drilling/sampling on MW-43.
0954 U.S.A. COE representatives on site:
Alan Shirey, Parker Morgan
1150 MW-43 Drilled and sampled to depth of 57' bls. Water level measured at 48.35' bls. Screen to be set at 46'-56' bls.
1200 Breaking for lunch.
1300 Preparing to install well. Bottom cap dia.: 2" pvc; length 0.30'. Screen: 2" dia pvc, 0.020 slot, cut slots, 10.01' long. Riser pipe: 2" dia pvc. Riser pipe lengths (from bottom): 10.01', 10.02', 10.02', 10.00', 10.02' (Total: 50.07')
1320 Well screen and riser pipe installed in well with screen at 46.0'-56.0'.
1324 Begin installation of filter pack (#1A sand)
1352 Six 50-lb. bags of #1A filter sand installed. Top of filter sand tagged at 42.85' bls.
1357 1 1/4 50-lb. bags of Baroid Hole Plug 3/8" bentonite chips installed. Top of bentonite seal tagged at 39.9' bls.
1402 Water added to hydrate bentonite.
1420 Moving to decon drill tools.
1530 Meet with P. Albemarius to discuss findings of Corps of Engineers. One crew begins

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J. W. Furlow 8/5/98

August 5, 1998
rebuilding decon pad.
1620 M. Coleman to Home Depot for decon pad
rope and posts.
1745 All personnel off site for the day.

J. W. Furlow
8/5/98

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J.W. Farlow

August 6, 1998 Weather: Clear, hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman
Technical Oversight: Jim Furlow

0700 All personnel on site.
0715 J. Furlow conducts daily Health & Safety Tailgate briefing
0750 Checking IDW drums for proper identification labels; drill crew moving drums to drum staging area.
1330 All drums moved to staging area. Crew working to get drums set on pallets.
1335 J. Furlow to see Tom Yocum about location of MW-33 (near underground tunnel) and clearing paths to well locations on south side of property.
1400 Development of MW-56 completed (see Well Development Logbook for details).
1515 All drums moved to staging area, most on pallets. Will put remainder on pallets when we can obtain more pallets. Going to monitor well locations south of power line to clear access roads.
1705 Monitor well locations MW-69 and MW-70 cleared and staked.
1730 Roads repaired, crew going to decon area
1745 All personnel off site for the day.

J. W. Furlow
8/6/98

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J. W. Furlow 8/7/98

August 7, 1998 Weather: Clear, Hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Drillers: Mike Coleman

0700 All personnel on site
0715 J. Furlow conducts daily Tailgate Health and Safety Meeting.
0725 J. Furlow and M. Coleman to clear access roads and work pads for wells along south power line.
0745 Begin clearing road and pad for MW-67.
0840 Pad and road for MW-67 cleared. Moving to MW-66.
0935 Pad and road for MW-66 cleared. Moving to MW-64 and MW-65.
1210 Road and pads for MW-65 and MW-64 cleared. Moving to MW-63.
1330 Road and pad for MW-63 cleared. M. Coleman working to widen some roads, will then move all drums to drum storage area.
1420 J. Furlow off site.

J. W. Furlow
8/7/98

RECORD

Book #8

July 20 1998 –

April [illegible] 1999

AIP Well Installation

July 21, 1998 clear, hot

Ø715 Met at Field office w/ Jim and Woody. Calibrate PID

Subcontractor: Alliance Environmental, Inc.

Project: AIP Monitoring Well Installation

Driller: George Wilkenson

Helper: Ricky Derth

Technical Oversight: Scott Martin

Ø829 Alliance sets up rig at MW-38. Waiting on other team to bring along hand auger. We will auger by hand for the first four (4') feet to insure against utility interference.

Ø915 Begin hand augering to five feet BLS (5').

1Ø2Ø Begin augering with B61 drill rig.

1Ø3Ø After augering to 2', winch on hammer is not releasing properly, shut down while driller (George) + Helper (Ricky) attempt to fix it.

1Ø55 Begin sampling again.

145Ø Augered thus far: 5Ø' BLS. Stop for a quick lunch.

1515 Restart augering.

174Ø Encounter water at ~~5~~ 54.5' BLS; auger to 65.Ø' BLS; Demobolize leaving rig on site and augers in ground to come back tomorrow.

SM 7/21/98

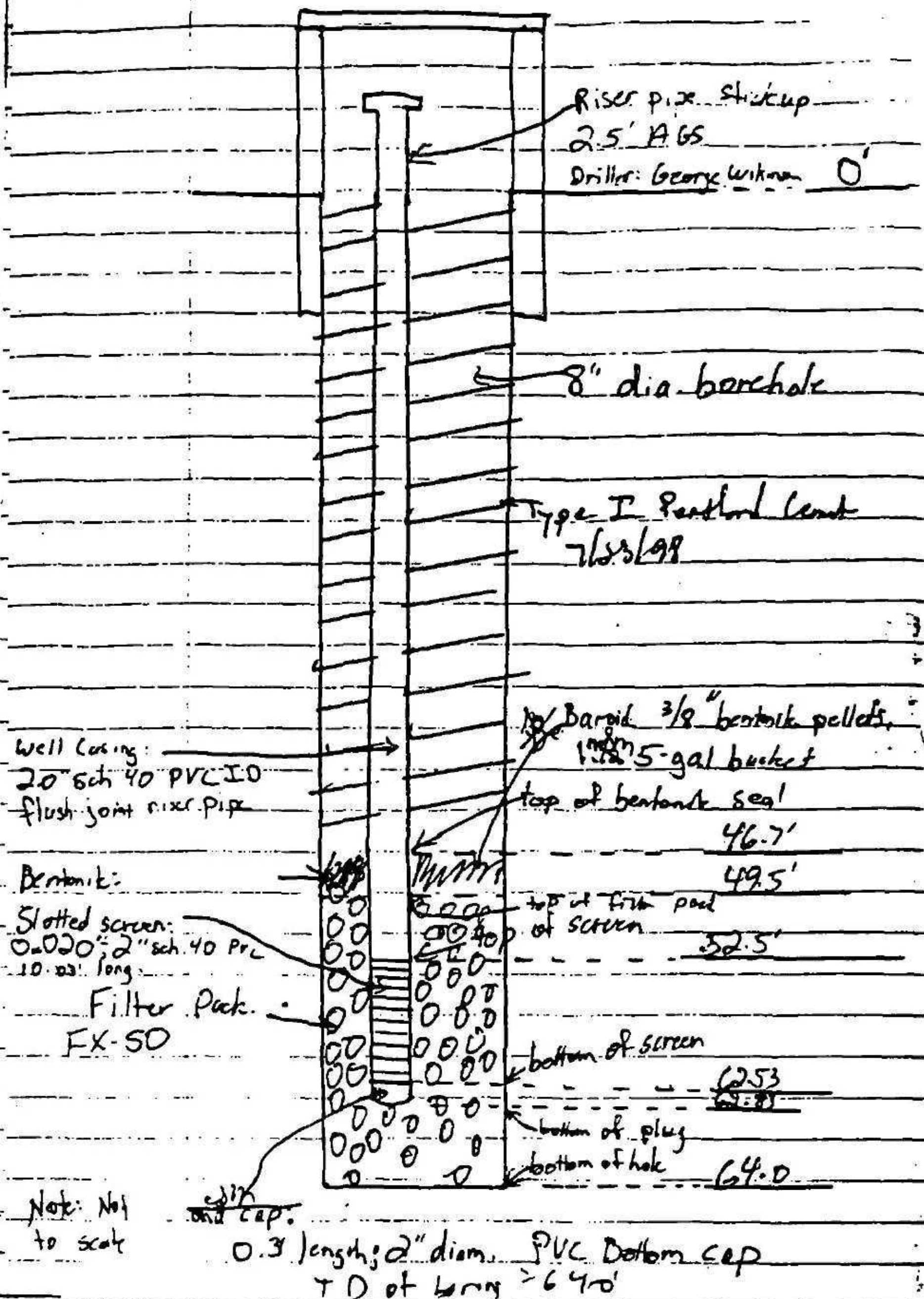
DM
7/21/98

July 22, 1998 Weather: clear, hot
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc
Driller: George Wilkinson
Helper: Ricky Darth
Technical Oversight: Scott Martin (S.A. Martin)

0710 Go with drill crew to measure water level of MW-38.
0720 Leave drill crew to begin preparing boring hole for well installation. Come to office to calibrate PID & find out slot size from sieve analyses.
0735 Will be using .020 slot screen with FX-50 filter pack.
0745 S.A. Martin arrives back at MW-38.
0800 Measure well screen and riser lengths.
~~0820~~ After steam cleaning, riser is cut to allow for 52.4' BLS above well screen.
0825 Begin well installation. Filter Pack sand is 50 lb bags of 'Foster Dixiona' FX-50.
Total depth of boring is 64.0'.
Well measurements are as follows:

Well cap:	0.3'	
Screen interval:	10.03'	total
riser extension 1:	10.00'	20.33'
riser extension 2:	10.02'	30.35'
riser ext 3	10.02'	40.37'
riser ext 4	10.02'	50.39'
riser ext. 5	10.03'	60.42'
riser ext. 6	4.91'	65.33'

MW-38



Riser pipe Stickup
2.5' AGS
Driller: George Wikman
0'
8" dia borehole
Type I Portland Cement
7/23/98
Baroid 3/8" bentonite pellets,
5-gal bucket
Well Casing:
2.0 sch 40 PVC I.D.
flush joint riser pipe
top of bentonite seal
46.7'
49.5'
Bentonite:
top of filter pack
of screen
Slotted screen:
0.020", 2" sch. 40 PVC
10.03' long
52.5'
Filter Pack
FX-50
bottom of screen
62.53
bottom of plug
bottom of hole
64.0
Note: Not to scale
end cap.
0.3' length; 2" diam. PVC Bottom cap
T D of boring > 64.0'

July 22, 1998 Weather: P.C, Hot

0840 Total Well Length (including 2.5' extension ALS) is 65.33'
subtract extension ALS -2.50
62.83
Subtract screen int. 10.33
52.50'

Well riser is 52.50' above screen int.

0845 62.83' is total well length.
Top of sand is 60.5' (prior to pulling well to mark), this was accomplished using 2 bags of sand.
Top of filter pack should be at 49.0' to 49.5' BLS. Thus allowing for at least 3' of filter pack above sand.

0855 Top of sand is 54.0' after 3 bags of sand.
5 ~~bag~~ Bags of sand = 51.2' BLS

0905 6 bags = 49.8' BLS

0908 6½ Bags = 49.5' BLS

0911 1 5gal Bucket of bentonite pellets = 46.7' BLS
Add approx. 5 gallons of water.

0925 S.A. Martin leaves site for office; subcontractor pulls remaining augers; demobilizes; goes to decon pad to steam clean augers and ss samplers.

1055 Arrive at location MW-57. Setup exclusion. Begin hand augering first five (5) feet of soil to clear utilities.

1155 S.A. Martin leaves site to go to lunch

1230 S.A. Martin back on site

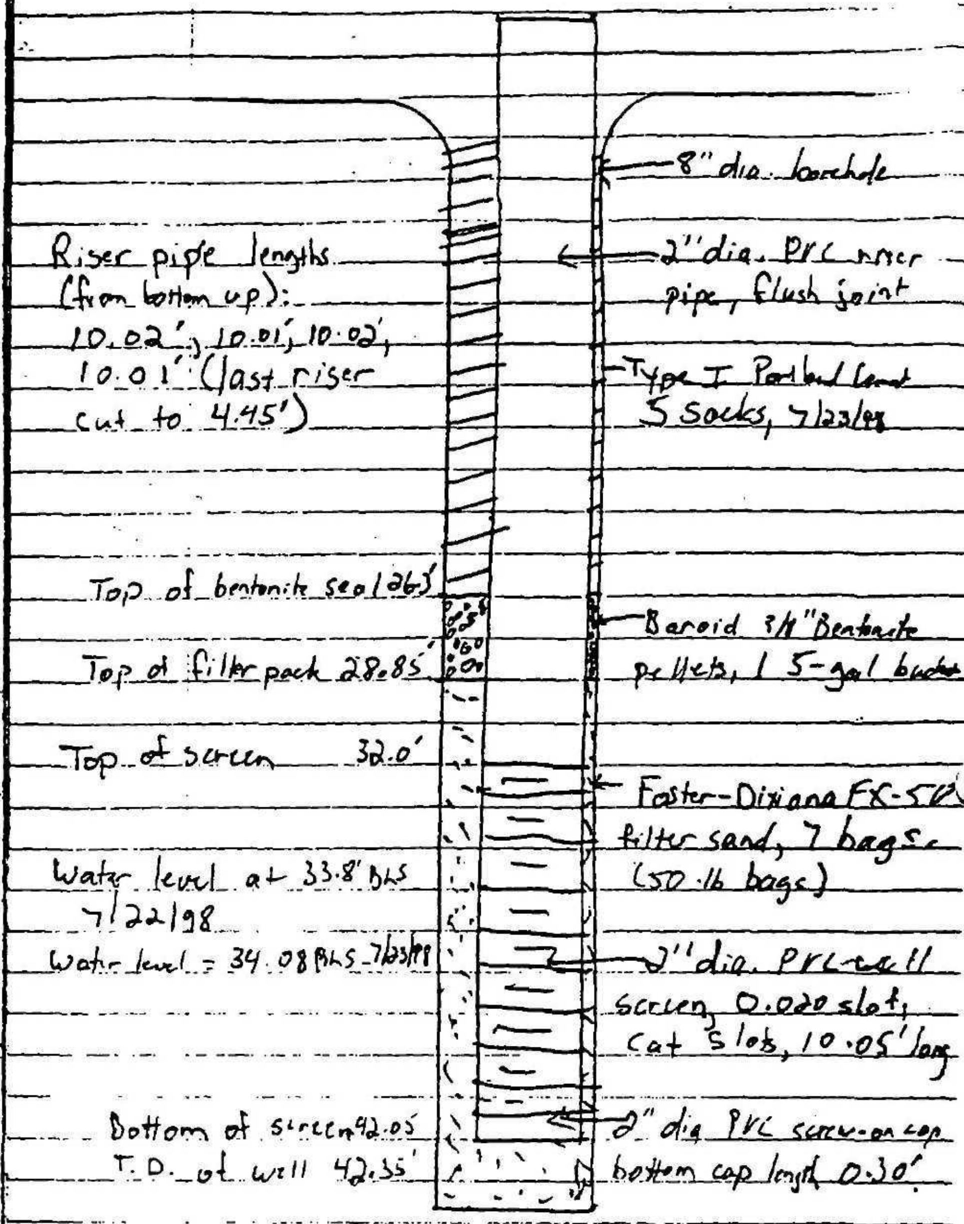
1235 Auger to five feet; begin sampling

Allied Industrial Park

6 MW-~~42~~ 257

Stickup: 2.5' above grnd

Driller: George Wilkinson



Note: Not to Scale

T.D. of Boring: 45.0'

July 22, 1998 Weather: Cloudy, Hot, Windy

1510 Stop augering at 45' BLS; water encountered at 35'-37' sampling int. Water level measurement = 33.9' BLS. Drillers removing augers and dropping wood plug.

Woody took sieve analyses sample immediately after encountering groundwater.

1525 Will use 0.020 mill slotted screen, with FX-50 filter pack

1605 Water level measured at 33.8' BLS; drill crew steam cleaning well screen and riser pipe; lengths: bottom cap: 0.30'; screen: 10.05; riser pipe (from bottom): 10.02, 10.01, 10.02, 10.01 (total riser = 40.06)

Water level = 34.0', riser should be 32.0' above well screen.

32.0 - 30.05 = 1.95' + 2.5 = 4.45'

Upper riser to be cut at 4.45' above next lowest riser.

Using 50-lb bags of Foster-Dixiana FX-50 Filter Pack

33.9' top of sand after 3 bags

30.0' " " " " 6 bags

28.85' top of sand; put bentonite pellets in at this point 7 bags total.

26.3' to top of bentonite, for a total bentonite column of 2.55'.

1630 Demobolize; Drillers to decon; Myself back to field office.

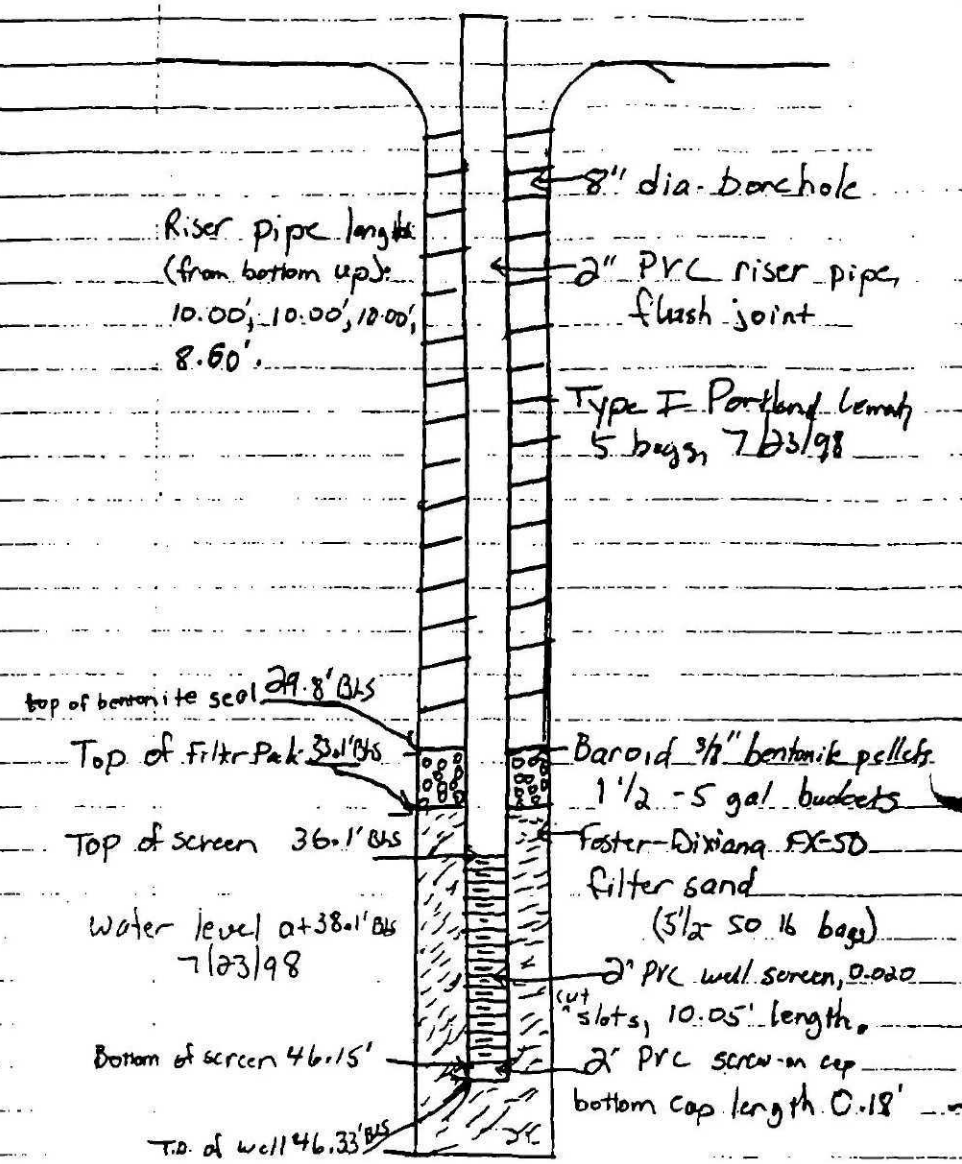
DM 7/22/98

Allied Industrial Park

8 MW-48

Stickup: 2.5' above ground

Driller: George Wilkinson



T.D. of boring 47.0' BLS

Note: Not to Scale

July 23, 1998 Weather: Clear, Hot
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc
Driller: George Wilkinson
Helper: Ricky Dearth
Technical Oversight: Scott A. Martin

0710 Calibrate PID, MICROTIP IS-3000
Serial # UA930190.
0715 Attend H + S meeting.
0730 Arrive at MW-57 to check water level
Water Level = 34.08. BLS.
0736 Set up on MW-48; Hand auger for the first 5'.
0750 Begin drilling
0950 Stop drilling; water level at 38.1' BLS;
Have augered to 47' BLS; waiting on
sieve analyses.
1012 Removing augers, putting in wood plug,
reinstalling augers.
1030 Will be using 0.020 slotted screen
and FX-50 filter pack; Drill crew steam
cleans ~~and~~ the well screen and riser pipe;
measurements (length) are as follows:
bottom cap: 0.~~3~~ .18', .80 well screen: 10.05'; riser
pipe (from bottom): 10.00'; 10.00; 10.00,
10.02' (30.00 + 10.02 = 40.02)
Top of screen should be at 36.1' BLS.
(formula is: (Water Level = 38.1' − 2')
Riser length should equal (36.1 + 2.5' = 38.6')
Cut forth riser at 38.6' and mark at 36.1'
Bottom of screen interval should be
at (36.1 + 10.05 + 0.18 = 46.33' BLS)
1134 2 50-lb bags of FX-50 (Foster-Dixiana)

7/23/98

July 23, 1998 Weather: Cloudy, Hot

top of at 37.8' BLS, top of filter pack needs to be approx. 33.1' BLS (3' above screen).

4 1/2 bags = 34.4' BLS

5 1/2 bags = 33.1' BLS; top of filterpack

1 1/2 buckets of baroid bentonite pellets are used, top of bentonite = 29.8' BLS

This creates a 3.3' bentonite seal.

1215 Augers pulled after 5 gallons of water added to bentonite, demobalize Alliance to decon pad, S.A. Martin to office and lunch.

1350 After Rain delay, arrive at MW-56, mobilize and begin augering.

1508 At ~~30.0~~ 30'-32' interval, sample is wet, yet no detectable water levels. will continue to auger at 5' intervals, checking the water level each interval as well.

1518 Water level at 32.1' BLS.

1550 Water level at 33.25' BLS; Not certain why it dropped. Have to auger down one more foot to 42' BLS.

1616 After pulling the augers, the hole caved in at 29' BLS; The Auger and plug ~~are~~ sm are being pushed back to 42' BLS. Will be placing a temporary well screen ~~in~~ sm in overnight. the augers will be left in place and filter pack brought up to a few inches above the screen. If the water level rises overnight, the well will be pulled up so that the interval of screen can be placed accordingly.

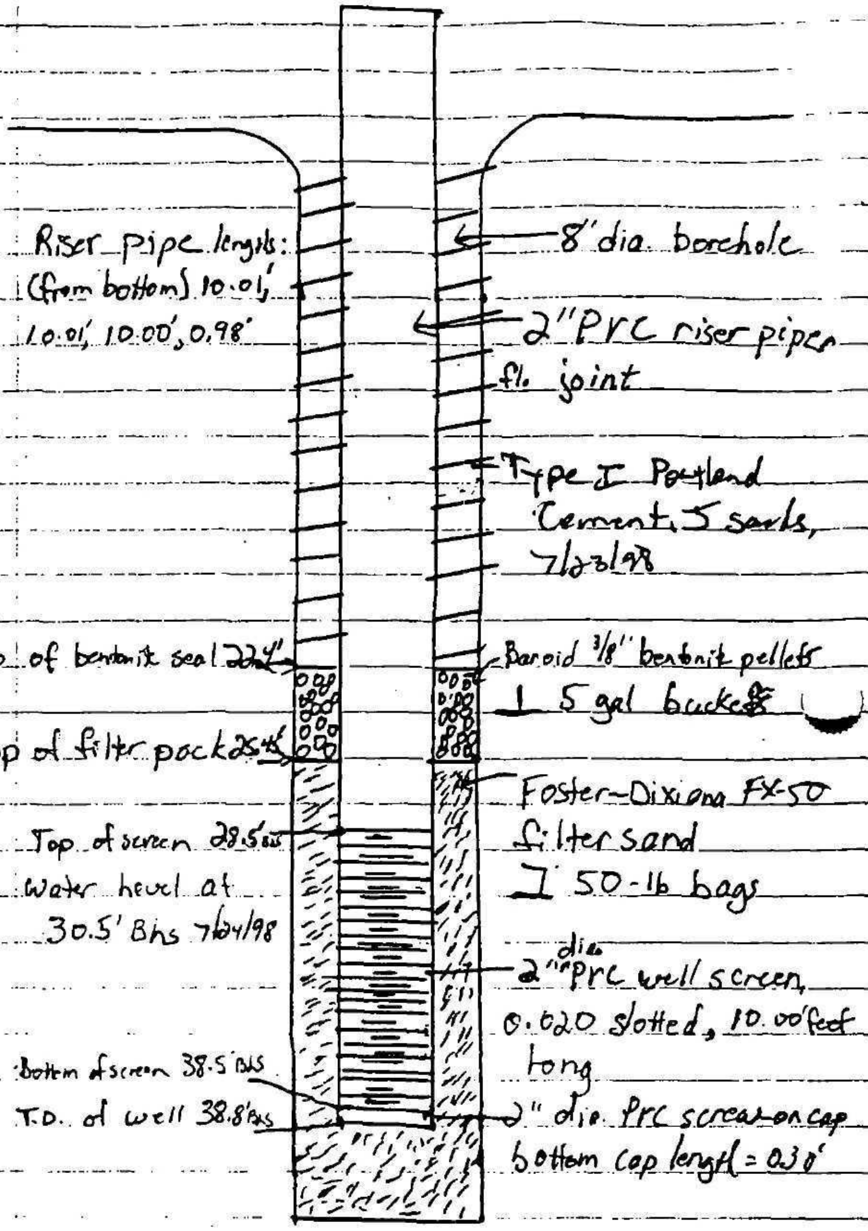
Riser and Screen measurements are as

12 Allied Industrial Park

MW-56

stickup: 2.5' above ground

Driller: George Wilkinson



T.D. of boring 42.0' BLS

Note: Not to Scale

July 23, 1998
follows.
Screen 10.00', risers = 10.01', 10.01', 10.00'
(started risers at bottom). top riser = 3.48'.
Top of screen to be placed at 31' BLS
1656 Leave temporary well in with top
of screen at 31' BLS and top of
filter pack at 33.3' BLS using
2 3/4 bags of FX-50 sand. Also 20 slot
Screen.
1700 Leave for day

DM
7/23/98

DM 7/24/98

July 24, 1998 Weather: Overcast, Hot

0700 Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helper: Ricky Dearth
Technical Oversight: Scott A. Martin

0705 Health & Safety briefing
0710 Calibrate PID, load truck w/equipment
0720 Go to MW-56 to check water level on well.
Water level at 30.5' BLS; will need to pull screen (top) to 28.5' BLS.
0751 5½ bags (50-lb) of sand have brought sand up to 28.8' BLS; needs to be brought up to 25.5' BLS.
0757 6½ 50-lb bags = 26.10' BLS.
7 50-lb bags = 25.45' BLS; this is top of filter pack.
0845 Left site with George to get more bentonite pellets
Top of bentonite 22.4' BLS; Add water (approx. 5 gallons); demobolize and leave site. ~~to check~~ SAM
Pick up drums (drill crew) using wench.
0920 MW-56 - 3 drums; MW-47 - 3 drums;
0958 Decon Pad
1012 Arrive at MW-38; Four drums; MW-42 - 3 drums, MW-49 ~~or 42 (map not updated)~~ SAM - two (2) full and one (1) partial drum; MW-57 - two full and one partial; MW-48 - two full and one partial.
Note: MW-56 drums = 2 full + 1 partial
MW-47 drums = 2 full + 1 partial

SM 7/24/98

July 24, 1998

Note: mw38, three (3) full drums 1 one (1) partial;

mw-42; 2 full, 1 partial.

Drums are being off loaded behind decon pad (South of). Full drums are being added to the west end of existing drums. Partially filled drums are being set alongside other partially filled drums at east end of drums.

1133 Jim and Scott stake out well location for next week.

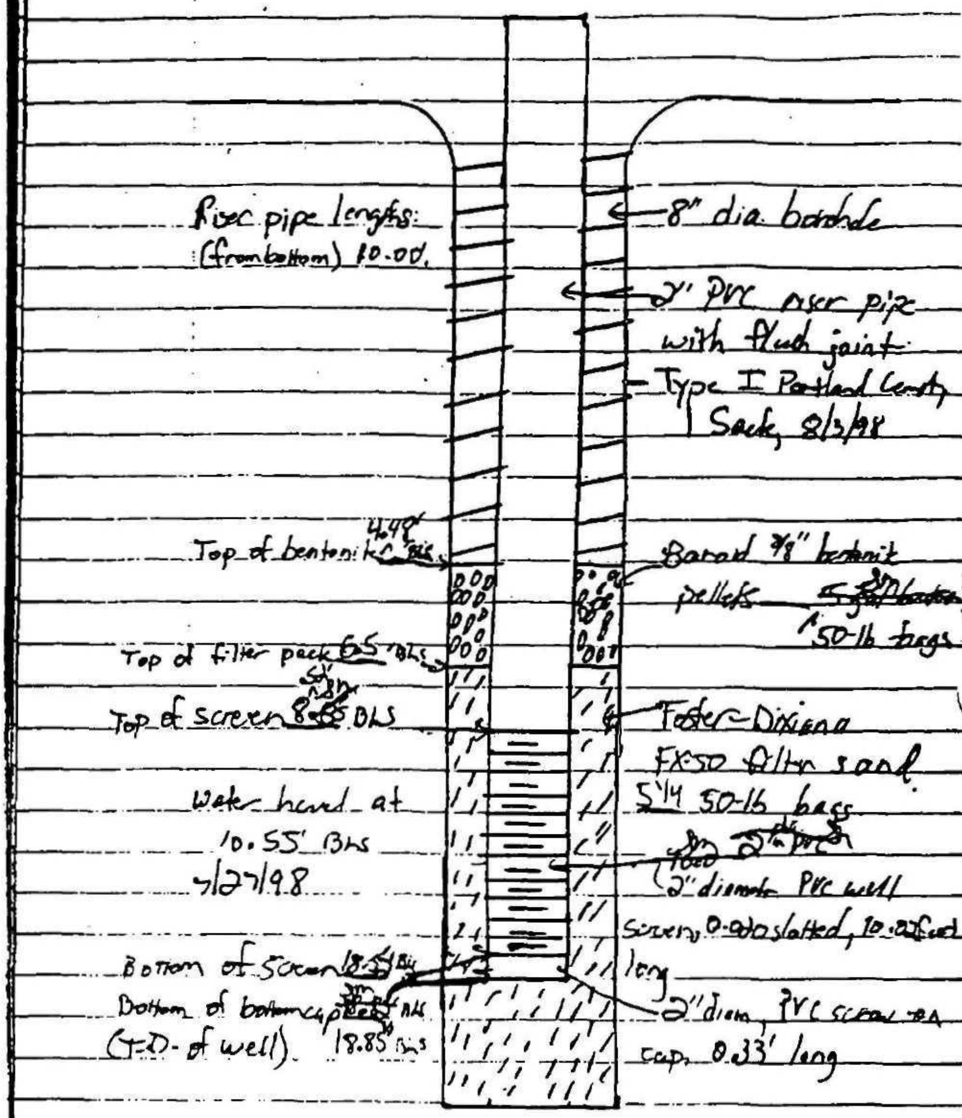
JM 7/24/98

Allied Industrial Park

18 MW-28

Stickup 2.5' above ground

Driller: George Wilkinson



T.D. of Boring = 20.0' BLS

Note: Not to Scale

July 27, 1998 Weather; Clear Hot
Project: AIP Monitoring Well Installation
Subcontractor; Allience Environmental, Inc.
Driller: George Wilkinson
Helper: Steve Hanson
Technical oversight: Scott A. Martin

0705 Health and Safety Briefing.
0715 Drillers to decon pad; take ~~the~~ drill rig to fill up.
0813 Arrive at MW-28; setup up exclusion zone; prepare to begin drilling.
0829 Begin augering
0919 Had wet sample in 10'-12' BLS interval, unable to attain water level, split spoon driven between 12'-14' BLS is wet but did not capture a sample, insert a split spoon retainer and try again.
0929 Water level = 11.55' BLS; will continuously sample to 20' BLS.
0945 After sampling the interval from 16'-18' BLS water level = 10.55' BLS; will still go to 20' BLS. Field Sieve Analysis sample taken to field office.
1018 Since Water Level ≈ 10.5' BLS; screen interval will run from 18.5' BLS to 8.5' BLS;
Riser, screen and end cap (bottom cap) measurements are as follows: (from bottom)
bottom cap = 0.3', screen = 10.05', riser length = 10.00'
Sieve analyses calls for a 0.020 slotted screen and FX-50 filter pack.
1108 5 bags of FX-50 ≈ ~~8.75~~ 6.75' BLS.
1130 5 1/4 bags of FX-50 = 6.5' BLS; this is

7/27/98

July 27, 1998

top of filter pack.

1137 1-50-lb bag Baroid 3/8" bentonite pellets brings top of bentonite to 4.9' BLS; needs to be at 4.5' BLS so will add more 1 1/3 bags = 4.48' BLS; top of bentonite; add ca 5 gal. water, pull augers; drill ~~eqmt~~ team demobolizes and goes to decon pad. S.A. Martin to field office and lunch.

1310 Set up drill rig at mw-29; begin hand augering first five feet (5').

1408 Stop temporarily due to thunder overhead.

1517 Back on site; continue augering
Note: whether: Mildly Hot, humid, slight drizzle to steady rain.

1700 Stop after augering to 35' BLS and leaving augers in the ground. When we start back tomorrow, will begin by sampling 35'-37' interval. Have not yet encountered groundwater. Cover soil drums, pickup tools, etc., leave site.

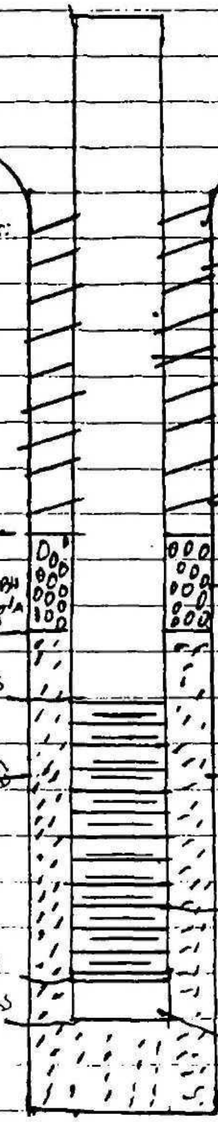
7/27/98

Allied Industrial Park

22 MW-29

stickup: 2.5' above ground

Driller: George Wilkinson



T.D. of boring = 67' BGS

Note: Not to
Scale

July 28, 1998 Weather: Hot, Overcast
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helper: Steve Hanson
Technical Oversight: Scott Martin

0709 Health & Safety Briefing.

0722 Arrive at MW-29, prepare to drive sample.
0725 Rain delay, thunder clouds also approaching
0855 The threat of a thunderstorm has decreased such that we are going to again operate the drill rig.
0901 Rain Delay; heavy rain - brief
0905 Start back
0934 During augering to 40' BLS - bolts came out of augers, 20' Auger still lies in the bottom of boring and will have to be removed.
1130 Augers have been removed, break for lunch.
1150 Back on site, driller + helper are taking apart augers to prepare to set them back in the boring, one of the augers has to be replaced due to damage.
Note: Apparently the auger flights have worn so much that the connecting bolts barely stick out beyond the auger flights. Normally this isn't a problem, but the media in the particular boring is dense enough to cause the bolts to turn and subsequently, in the case of the one particular auger, totally unscrew and release the auger. The damage that occured to the auger

DM
7/8/98

July 28, 1998

was a result of the fitting key breaking off. Not knowing that the augers were seperated, (at about 20' BLS), the driller (George), was lifting up on the augers and dropping them back down, in order to clean out the hole. Since the augers seperated, they were unable to join properly along the keyways (guides) and the piece of metal used as a key then broke off.

1242 Still advancing augers, currently at 35'. Alliance workers have left to get more augers. They are trying to only use augers that have not worn as much.

1305 Advance augers to 40'

1535 Water level = 57.7' BLS; will need to continue sampling ~~at~~ to ~~66 BLS~~; 66.7' BLS are currently augering to 62' BLS.

1635 Augered to 64' and sampled to 66' BLS. Water level = 57.5' BLS; will pull augers and reinsert with wood plug to a total depth of boring = 67' BLS. Well screen placement to be from 55.5' BLS to 65.5' BLS. Note: prior to removing augers, continued boring to a total depth of 67' and cleaned out boring. After inserting augers, will leave and install well first thing in the morning.

1735 Augers reinstalled at a depth of 67' BLS, leave site.

7/28/98

7/29/98

July 29, 1998 Weather: Cloudy, Hot

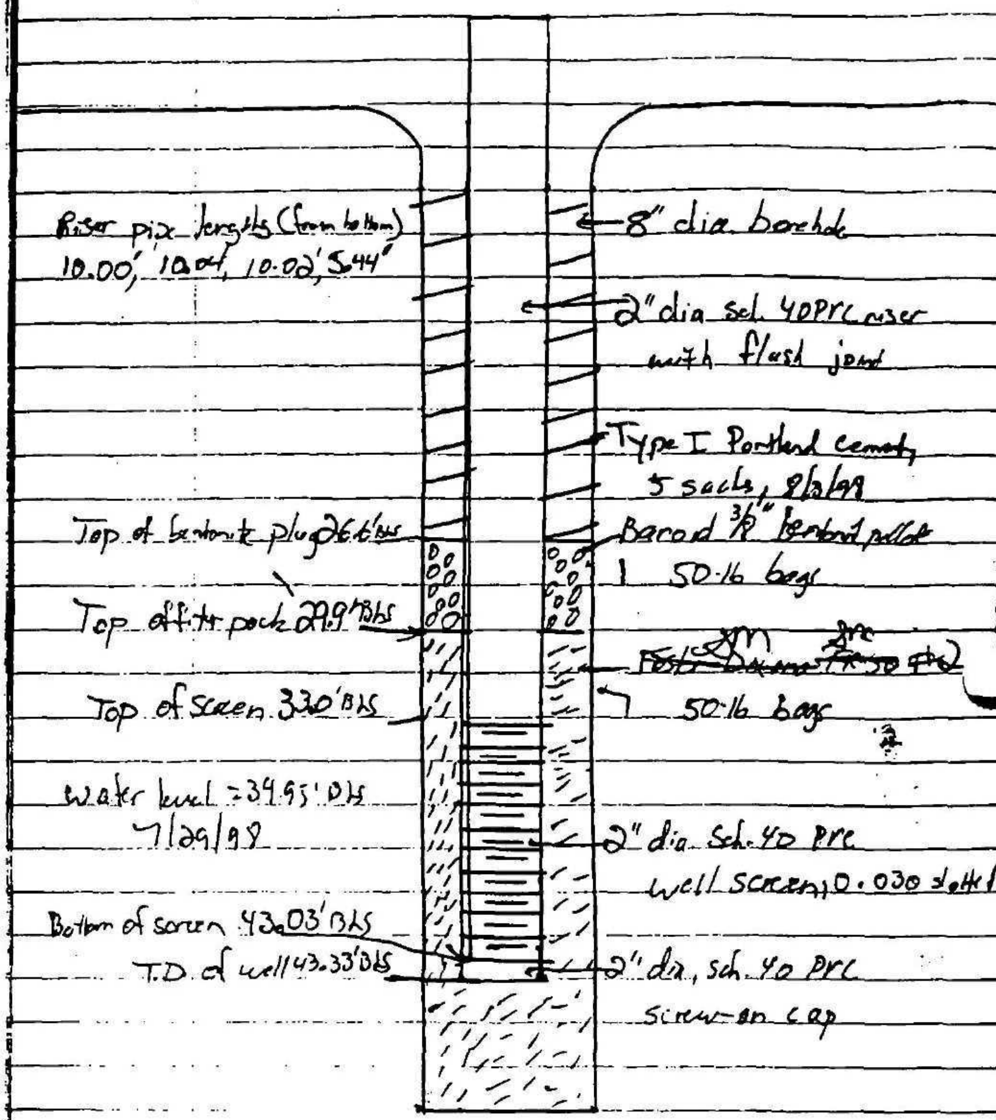
Project: AIP Monitoring Well Installation
Subcontractor: Allience Environmental, Inc
Driller: George Wilkinson
Helper: Steve Hanson, Richard Moony
Technical Oversight: Scott Martin

0705 Health & Safety briefing.
0709 Arrive at MW-29; prepare to set groundwater well. Total water Depth = 57.5' BLS (7/28/98), augers are already in ground with a plug. Well screen to be from 55.5' BLS to 65.5' BLS. Measurements (length) are as follows: (from bottom) bottom cap = 0.38', screen = 10.01', riser lengths: riser 1 = 10.02', riser 2 = 10.02', riser 3 = 10.01', riser 4 = 10.00', riser 5 = 10.01', riser 6 = 10.01'. Will cut riser 6 at ~~[illegible]~~ 7.94' to make the total length = 58.00', allowing for 2.5 of stick up.
Note: 60.07' - 58.00' = 2.07'. Cutting the top riser at 2.07 leaves 7.94' of top riser. Added to the other 50.06' ~~and~~ with equals 58.00'.
0748 Clean off risers and screen via power cleaning.
0834 Top of sand = 57' BLS, after 4 - 50-lb bags.
0846 Top of filter pack = 50.48' BLS; this was accomplished using 6 3/4 50-lb bags of Foster-Dixiana FX-50.
0855 Top of Bentonite = 49.2' BLS. Demobilize and leave the site for decon pad.
Note: Field sieve analyses from yesterday performed on soils from the 60'-62' interval DH, determined that 0.020 slot and FX-50 filter sand should be used.
1050 Arrive at MW-30; setup and begin augering.
1243 Between 15' BLS and approx 20' BLS

Allied Industrial Park

28 MW-30

Stickup 2.5' above grade
Driller George Wilkinson



T.D. of boring = 44' bls.

Note: Not to scale

July 29, 1998

samples were wet and sampled continuously, unable to obtain water level reading, however, and sand in bottom (±5") of 19'-21' interval is not wet - only slightly damp. Augering and sampling cont. for 21'-23' to see if sample is wet, if not, this must have been a perched zone.

1300 Note: Driller drilled past 21'-23' interval due to miscommunication/miscalculation. Next interval sampled was 23'-25' BLS. This interval only slightly damp will next next two foot interval (25'-27') and if not wet, continue on 5' intervals.

1402 ~~27'~~ 27'-29' interval only slightly damp, did not log, auger on to 30' BLS.

1428 Water level = 34.5' BLS

1438 Water level = 34.93' BLS, will auger and sample to 44.0' BLS.

Pull augers; insert wood plug, re-install augers to a total depth of 44' BLS. Well screen to ~~extend~~ be at 33' BLS at top.

1620 Well lengths are as follows: bottom cap 0.5; screen = 10.03', riser 1 = 10.00', riser 2 = 10.04', riser 3 = 10.02', 10.03'.

Calculation: 33.00 + 40.09 = 73.09 - 25 = 4.59

Cut top riser at 4.59' from the top.

Note: Field sieve analyses has determined that FX-50 filter pack and 0.020 slot screen should be used in this media.

1745 While filling in filter pack, the sand became stuck in between the auger and riser. After trying for about 45 minutes, we decided to pull the well tomorrow morning and start over.

[illegible] 7/30/97

7/30/98 - July 30, 1998
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helper: Steve Hanson, Richard Mooney
Technical Oversight: Scott Martin

0700 Health & Safety Meeting.
0709 Calibrate instruments (PID).
0714 Back at site MW-30. Removing augers and well. Will have to replace well. New well will be 0.030 slot and use #2 filter pack, this was determined this morning based on a review of the sieve ~~and~~ analyses. It (the review) showed ~~on~~ Jim that a mistake had been made during the earlier calculation
0828 Screen length = 10.00'. Wash off risers and new screen using steam cleaner. Begin to re-install well using ~~#2A~~ #2 filter pack.
0910 Top of filter pack sand after 3-50lb bags = 38.0' BLS. Completed filter pack needs to be at approx. 30.0' BLS.
6 bags = 31.5' BLS.
Top of filter pack = 29.9' BLS, this was accomplished using 7-50lb bags.
Top of bentonite is at 26.6' BLS, accomplished using 1-50lb bag. Add 5 gallons of water to bentonite plug for hydration. Driller pull augers and demobolize. S.A. Martin to field office,
1155 Arrive at MW-35, begin hand augering for first five feet (5'). Setup exclusion zone. Begin augering.
1237 Delayed due to slide on drill rig not

Dm
7/30/98

moving out.

1310 Drill rig working, begin augering.

1330 Richard Mooney replaces Steve Hanson as helper

1403 Shut down temporarily due to thunder/heavy rains.

1440 Start back augering.

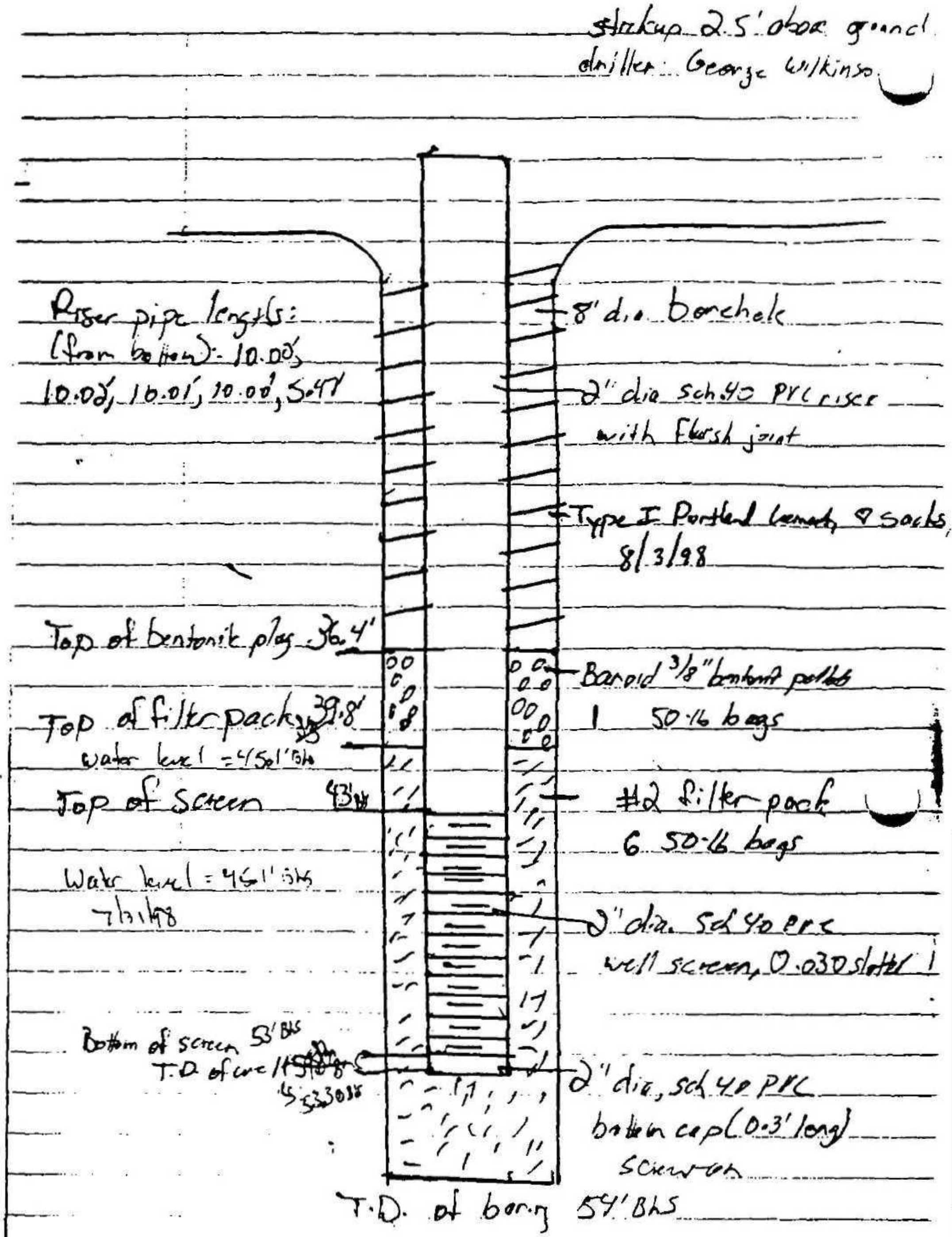
1504 Rain delay.

1650 Leave for day

DM 7/30/97

Allied Industrial Park

34 MW-35



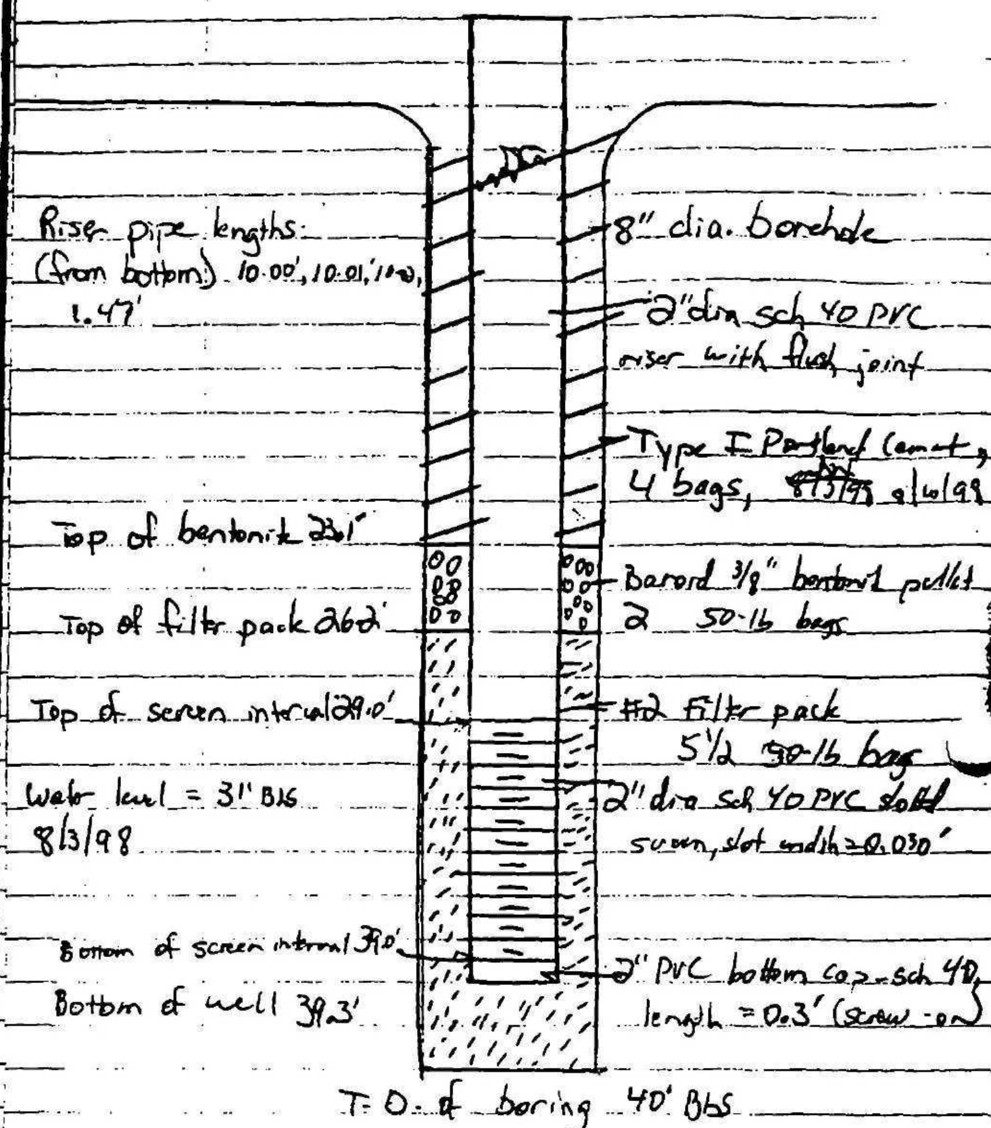
Note: Not to scale

July 31, 1998 Weather: P.C. Hot
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helper: Richard Mooney
Technical Oversight: Scott A Martin

0708 Health & Safety meeting, calibrate PID.
0720 Arrive at MW35, begin drilling.
0846 Water level = 44.6' BhS; keep sampling to 53' BhS. Send sample from 47'-49' interval for field grain size dist. test.
0915 Water level = 45.1' BhS; Final hole depth to be 54' BhS. Auger to 54' and clean out hole. George pulls augers to ~~[illegible]~~ SM insert wooden plug and pushes augers back down boring to 54' BhS. Screen interval to be 43' BhS to 53' BhS
1002 Measurements: bottom cap = 0.3' BhS, Screen = 10.00' risers: 10.00', 10.02', 10.01, 10.00', 10.00'.
Calculation (43.0+2.5 = 45.5)
~~45.50~~ 50.03 - 45.50 = 4.53'
Cut 4.53' from top of last riser.
Note: Sieve analyses determined that a 0.030 slotted screen and a #2 filter pack should be used.
1046 43.5' to top of filter pack - 4 bags #2
1101 39.8 = top of ~~bentonite~~ SM filter pack; accomplished using six (6) bags.
Top of bentonite = 36.4' BhS; demobilize; 1 bag
Drillers to decon pad.
SM
7/31/98

Allied Industrial Park
36 MW-40

stickup: 2.5' above ground
Driller: George Wilkinson



Note: Not to scale

August 3, 1998 Weather: Hot, Clear
Project: AIP Monitoring Well
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helpers: Steve Hanson, Dennis Creech, Julius Twiggs
Technical Oversight: Scott A. Martin

0730 Arrive on site.
0735 Health + Safety briefing.
0742 Calibrate PID.
0820 Arrive at MW-40, setup and prepare to start augering
0850 Begin augering.
1025 Water level = 31' BLS; will sample and auger to 40' BLS.
1056 At 38' BLS, water level = 31.3' BLS, keep augering to 40' BLS. Screened interval will be from 29.3' to 39.3' BLS.
1106 Due to course sands and fine gravels, will use 0.030 slotted PVC with #2 filter pack
1108 Water level risen back to 31' BLS, so screened interval to be from 29.0' BLS to 39.0' BLS. Pull augers, insert wood plug and push augers back down to 40' BLS.
New (additional) helper arrives on site, Julius Twiggs.
1150 Leave site for lunch and to get well risers, screen, filter pack and steam cleaner
1222 Need 29.0' + 2.5' = 31.5' of riser.
Screen and riser measurements are as follows: bottom cap (0.3'), Screen = 10.00', ~~risers~~ = 10.00', 10.01', 10.02', = 30.03; has riser to be cut at (31.50 - 30.03) = 1.47'

DM
8/3/98

August 3, 1998

1340 Top of filter pack = 26.2' BLS - done using 5 1/2 - 50-lb bags
Top of bentonite = 23.1' BLS ~~following~~ using 2 50-lb bags of baroid 3/8" pellets.

1352 Pull remaining augers, demobilize, leave site - Drillers to decon, S.A. Martin to office.

1440 Arrive at MW-55, use sickel to clear out work area (helpers), setup and prepare to begin augering (including set up exclusion zone).

1509 Begin sampling 0'-2', followed by augering.

1627 Water level = 24.5' BLS, continue to to sample and auger to 33' BLS.

1651 Augered to ~~35'~~ 33' BLS. Leave augers in ground overnight. Done for the day.

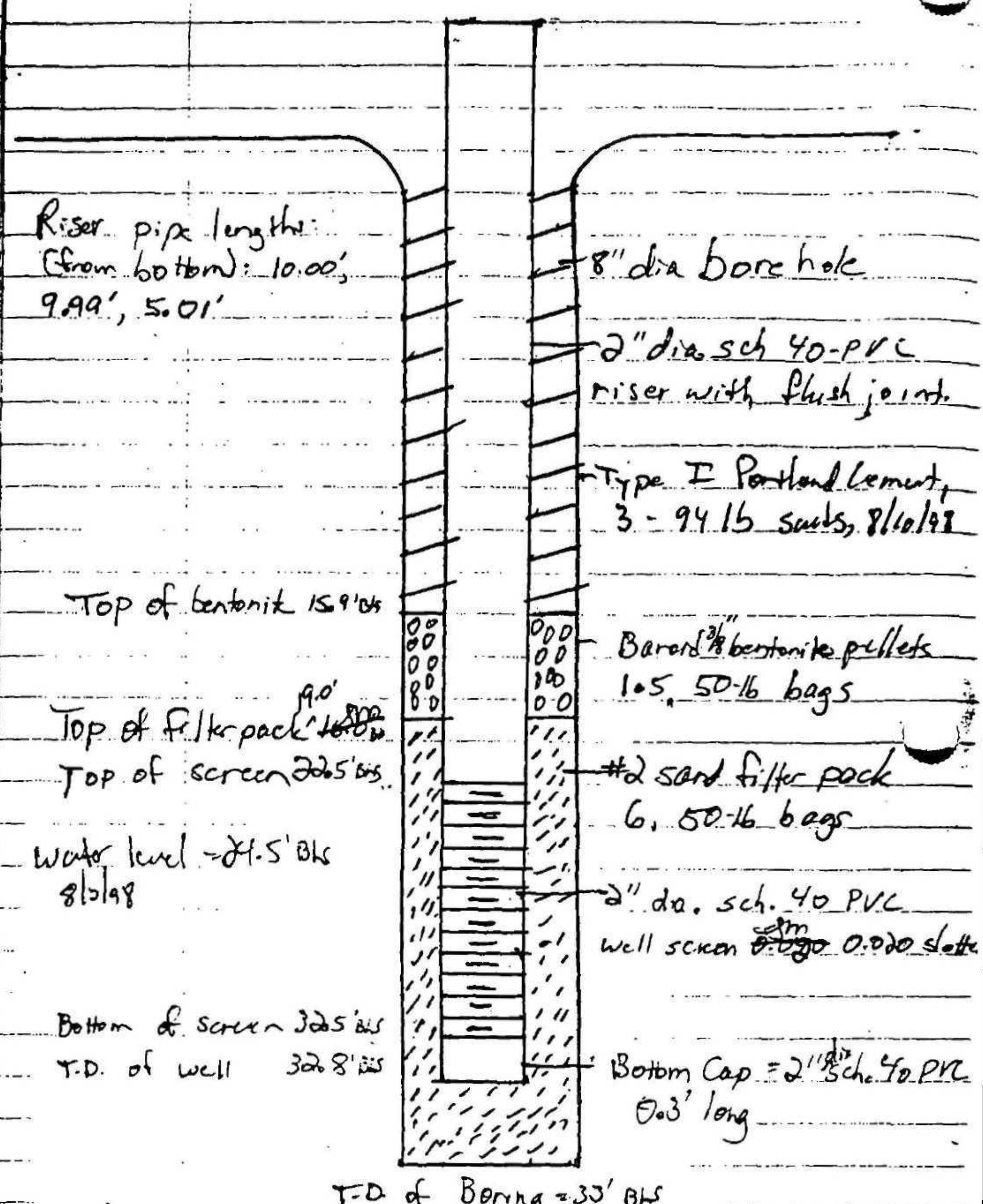
SM 8/3/98

Allied Industrial Park

40 MW-55

Stickup: 2.5' above ground

Driller: George Wilkinson



Note: Not to scale

August 4, 1998 Weather: Clear, Warm

Project: AIP monitoring Well Installation

Subcontractor: Alliance Environmental, INC

Driller: George Wilkinson

Helpers: Steve Hanson, Dennis Creech

Technical Oversight: Scott A. Martin

0700 Health + Safety briefing

0705 Calibrate PID, gather field equipment

0725 Arrive back at MW-55, driller + helpers remove augers, plug and replace. Screen interval to be from 22.5' to 32.5' BLS. Will need 25' of riser (includes 2.5' of stickup + 22.5' above screen).

Riser and screen lengths:

bottom cap = 0.3', screen = 10.00', riser = 10.00', 9.99', 10.00'. Cut top riser at 5.01'.

Due to a clay section in the screen interval, we will be using a 0.020 slotted screen. The predominant screen interval soil is fine to med ~~gr~~ grained clean sand, and there is very little ~~fine~~ silt particles. #2 Sand will be used for the filter pack.

0848 Top of filter pack after 4 bags of #2 sand = 23.1' BLS. Needs to be approx 19.5'.

0853 Top of filter pack = 19.0' BLS after 6-50lb bags. Top of bentonite = ~~16~~ 15.9' BLS ~1½ bags.

0907 Pull augers, demobilize and leave site. Drillers go to decon pad for decon of augers. S.A. Martin to field office.

0938 Arrive at MW-45, setup and prepare to auger

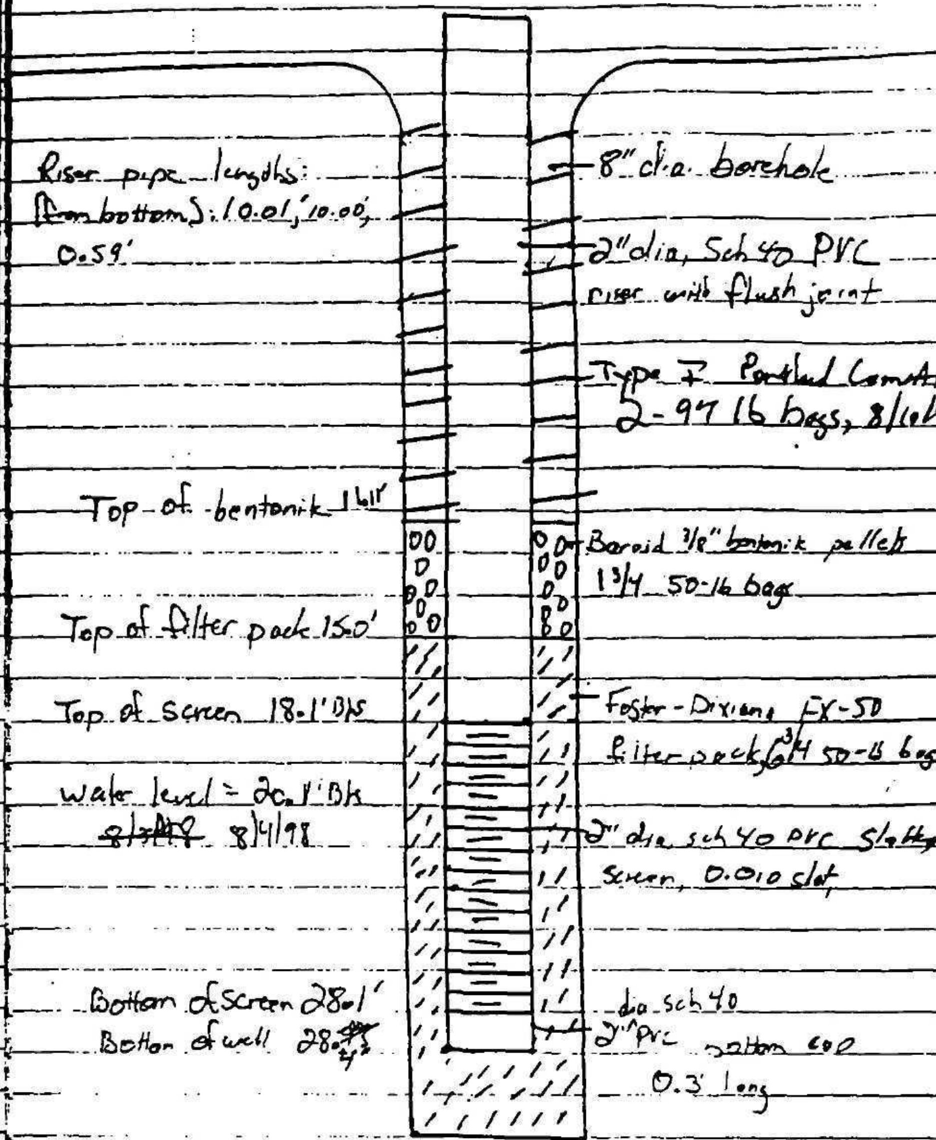
1023 A fire ant mound was discovered next

Allied Industrial Park

MW-45

Stick-up = 2.5' above grou

Driller: George Wilkinson



Riser pipe lengths: (from bottom): 10.01', 10.00', 0.59'

8" dia. borehole

2" dia. Sch 40 PVC riser with flush joint

Type I Portland Cement 2-94 lb bags, 8/10/98

Top of bentonite 16.1'

Baroid 3/8" bentonite pellets 1 3/4 50-lb bags

Top of filter pack 15.0'

Top of screen 18.1' BLS

Foster-Dixiana FX-50 filter pack 6 3/4 50-lb bags

Water level = 20.1' BLS ~~8/7/98~~ 8/4/98

2" dia. sch 40 PVC slotted screen, 0.010 slot

Bottom of screen 28.1'

Bottom of well 28.4'

2" dia. sch 40 PVC bottom cap 0.3' long

T.D. of well = 30.0' BLS

August 4, 1998
to the drilling location, lowering
Mast and moving forward (North) a few feet
to get away from mound.
1040 Drive split spoon 0'-2' - begin
augering.
1202 Water level = 20.1' BLS, Auger
to ~~28.5~~ 30.0' BLS, sample to 28' BLS.
Going to lunch.
Note: Purple (dusk red) in last samples
gave off 88 ppm when disturbed. This
was not breathing zone but at point of
contact. Will save the last two samples
for Project Manager to determine if they want
to run analytical samples.
1240 Back on site, pulling augers, will be monitoring
breathing zone closely.
1306 BZ - 1.8 ppm max during removal of
bit.
Screen interval to extend from 18.1' BLS
to 28.1 BLS.
1323 Saving bottom two sample interval
for Phil to look at. Did headspace
analyses for each after 15 minutes
24'-26' = 78 ppm
26'-28 = 175 ppm.
Riser and Screen lengths are as follows:
bottom cap = 0.3', Screen = 10.00,' risers
(from bottom) 10.01', 10.00', 10.02'.
Will use FX-50 filter pack and
0.010 slotted screen due to amount
of clay and silt particles in the screen
interval.
18.1 + 2.5 = 20.6' [20.60 - 20.01] = 0.59

DM
8/4/98

August 4, 1998

1408 S. M. Martin and Steve leave site to get tremie pipe. FX-50 Sand is wet and sticking inside the augers.
4 bags of FX50 sand = 17.2' BLS. Need to keep top of filter pack at about 15' BLS.

1504 6 3/4 - 50 lb bags of bentonite used to fill the top of filter pack to 15.0' BLS.
1 3/4" bags bentonite used to bring top of bentonite plug to 11.1' BLS.

1525 Pull remaining augers while monitoring breathing zone. Demobolize; leave site. White drillers go to decon augers, S. Martin to field office.

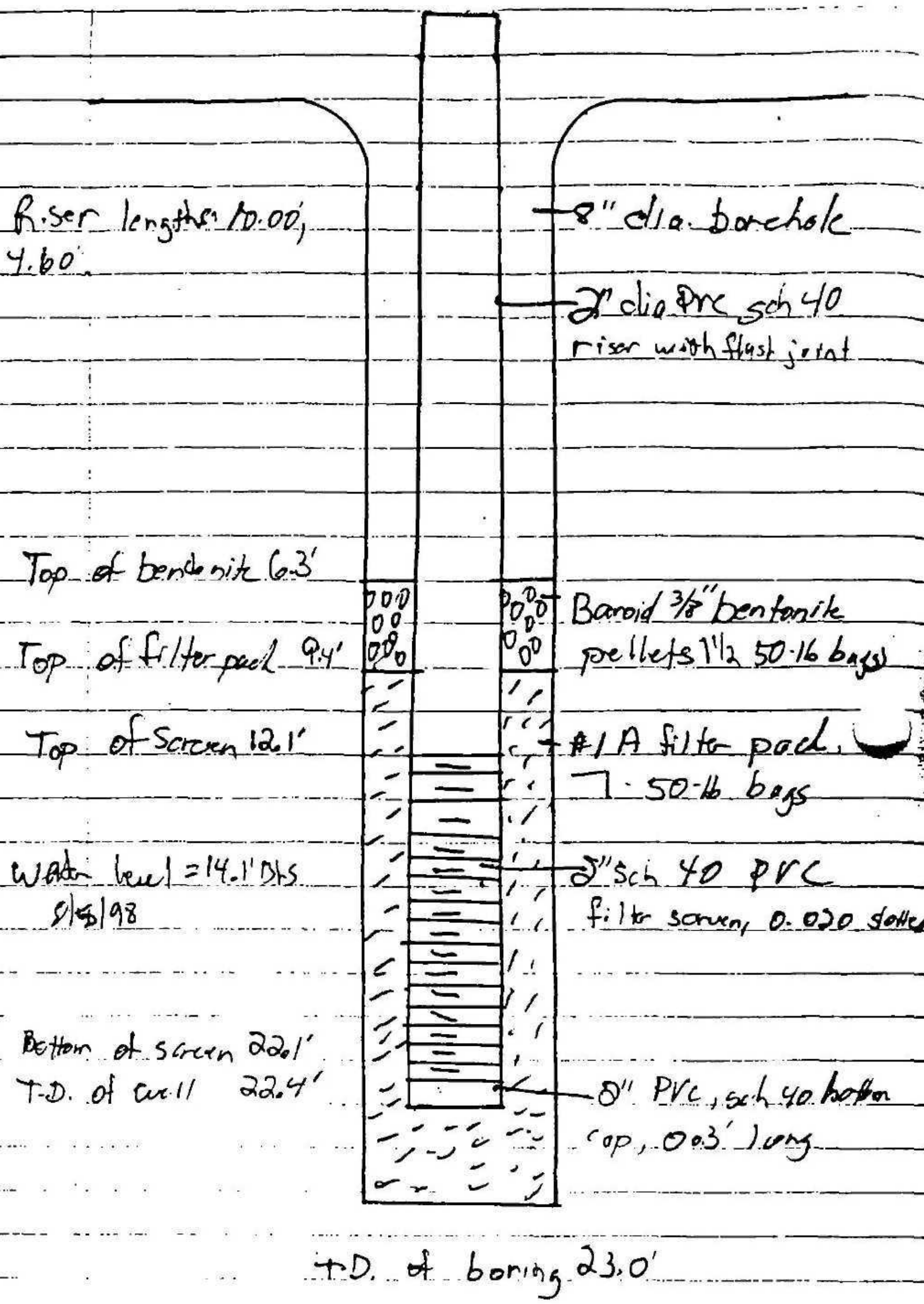
1607 S. Martin ~~tooks for~~ JM goes to put labels on all drums by monitoring wells drilled this week.

1620 Arrive at MW-39.
Note: This well is in kudzu, time is taken to find a clear path as well as to use the sickel to clear out a working space around the drill rig.
Setup drill rig and exclusion zone. Prepare to sample and auger. Will start drilling first thing in the morning.

JM
8/4/98

Allied Industrial Park
MW-39

Stickup: 2.5' above ground
Driller: George Wilkin



August 5, 1998 Weather: 80s Clear, Warm
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helper(s): Steve Hanson, Dennis Creech, Julius Twiggs
Technical Oversight: Scott A Martin

0701 Health and safety meeting.
0710 Calibrate PID.
0713 Driller and helpers to Decon pad area for well materials
0735 Arrive at MW-39, prepare to begin sampling and augering.
0805 Begin driving first sample.
0815 Stop work, PID breathing zone reading around 5.0 ppm. Going to office to calibrate PID again for quality assurance.
0829 Back at site. High reading most likely due to some isopropyl that was sprayed in the vicinity of the PID and had to evaporate from the bulb. Background PID reading = 0.7 ppm
0827 Note: Sample from 5'-7' interval is wet. Appears to be peat like, not sure if this is water table.
0852 10'-12': Still wet but not saturated, going to continue at 5' intervals.
0903 Water level ~ 14.1' BLS. Continuously sample to 23.1' BLS. Pull augers, set plug.
0954 Due to the two 0.3' lengths of clay within the mostly course and medium grained sands, we will be using 0.020 slotted screen with #1A filter pack sand. Helpers to leave site to get screen and filter

Jm
8/4/98

August 5, 1998

pack. Screen interval to be from 12.1' BHS to 22.1' BHS. Total Riser to equal 14.6'. Riser and screen lengths are as follows: bottom cap = 0.3', screen = 10.00', riser (from bottom): 10.00', 10.00.

1018 USACE employees are on site. Porter Morgan and Alan Shirey.

Porter Morgan

1032 S.A. Martin left site temporarily to take water level indicator to J. Furlow. Prepare to set well. Steam clean risers and screen.

1042 After placing wellscreen and riser in ground, realized that augers need to be pushed two more feet. They were only at 21.0' BHS rather than 23.0'. Pull wells, drive augers, reclean riser and ~~screen~~ SM screen, re set the well.

~~Filter pack top is at after 1 50 lb bag of #1A filter pack.~~ SM 8/5/98

1115 Sand is stuck between the auger and wellscreen. In an attempt to loosen the sand with the tremie pipe, the tamping rod ~~and~~ SM tape snapped and the tamping rod is lost. Also, since the sand is still stuck in the auger, we are pulling the augers and will ~~res~~ SM reset the augers with a new plug and start the well over. Alan Shirey and Porter Morgan leave the site for a while and will come back shortly. Porter concurred with the decision to pull the augers.

8/5/78

August 5, 1998

1157 After having to get wood plug from decon pad, drop augers back down hole.

1210 Lunch, will set well when return.

1255 Set well after steam cleaning riser + screen.

1328 3 bags (50 lb) of #1A well gravel brings top of filter pack column to 17.5' BLS.
4 bags = 14.1' BLS

1358 Note: Alan and Porter where here for approx. 45 minutes.

1402 Top of filter pack = 11.0' BLS after 6 bags - still needs to come up 2'.

1417 Top of ~~bentonite~~ filter pack = 9.4' BLS, 7 bags

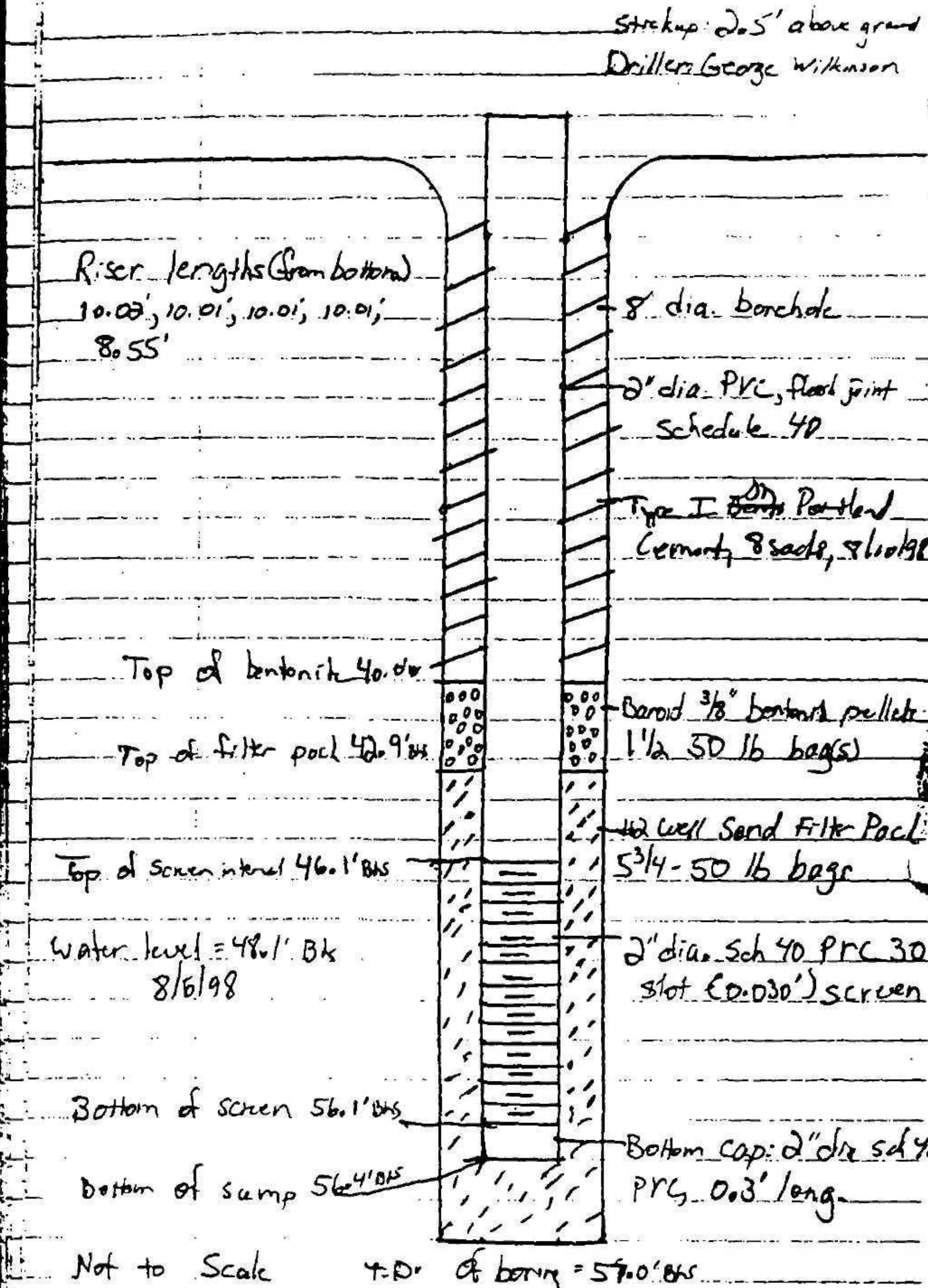
1430 Top of bentonite = 6.3' BLS, hydrate, 12 bags remaining bentonite, demobolize, leave site, drillers to decon pad. S. Martin to field office to relinquish geotechnical samples.

1520 Go to see about next stake.
Note: USACE personnel made several recomendations, including some changes at decon pad. No more drilling activities today while some changes are being implemented. Scott Martin to field office to catch up on some paperwork, and other misc. things.

8/5/98

Allied Industrial Park

52 MW-51



August 6, 1998
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc
Driller: George Wilkinson
Helpers: Steve Hanson, Dennis Creed
Technical Oversight: Scott A. Martin

0703 Health + Safety Meeting.
0710 Calibrate PID.
0735 Arrive at MW-51, setup drill rig and prepare to auger/drive sampler.
0759 Begin augering.
1105 Drillers are having trouble connecting the sampling rods, have to leave site to get a file, going to go ahead and have lunch
1200 Back on site, filing ~~rods~~ rod threads.
1237 Filing complete, begin driving next sample. Note: Sample interval is 45'-47'.
1325 Water level = 48.1' BLS; need to auger hole 57.0' BLS; Screened interval to be from 46.1' BLS to 56.1' BLS.
1401 Pull augers, insert wood plug, reinsert augers - prepare well for installation. Field sieve analyses to be done on screen interval. It will concur with decision to use 30 slot screen and #2 filter pack sand.
Note: Riser above screen = 46.1'.
Add 2.5' stickup = 48.6' of riser.
Riser and screen lengths are as follows:
Bottom cap 0.3', screen = 10.05', risers (from bottom): 10.02', 10.01', 10.01', 10.01', 10.01';
Cut 5th riser to equal Σ ~~40.05~~ 48.60 - 40.05 = 8.55, c/s, mark at 6.05-

DM
8/6/98

August 6, 1998

1542 3 1/2 bags of filter pack brings top of sand to 46.7' BLS, Top should be at 43.1' BLS.

1546 ~~Six~~ Five bags (50 lb each) = 43.7' BLS.

1549 5 3/4 50 lb bags = 42.9' BLS - top of filter pack.

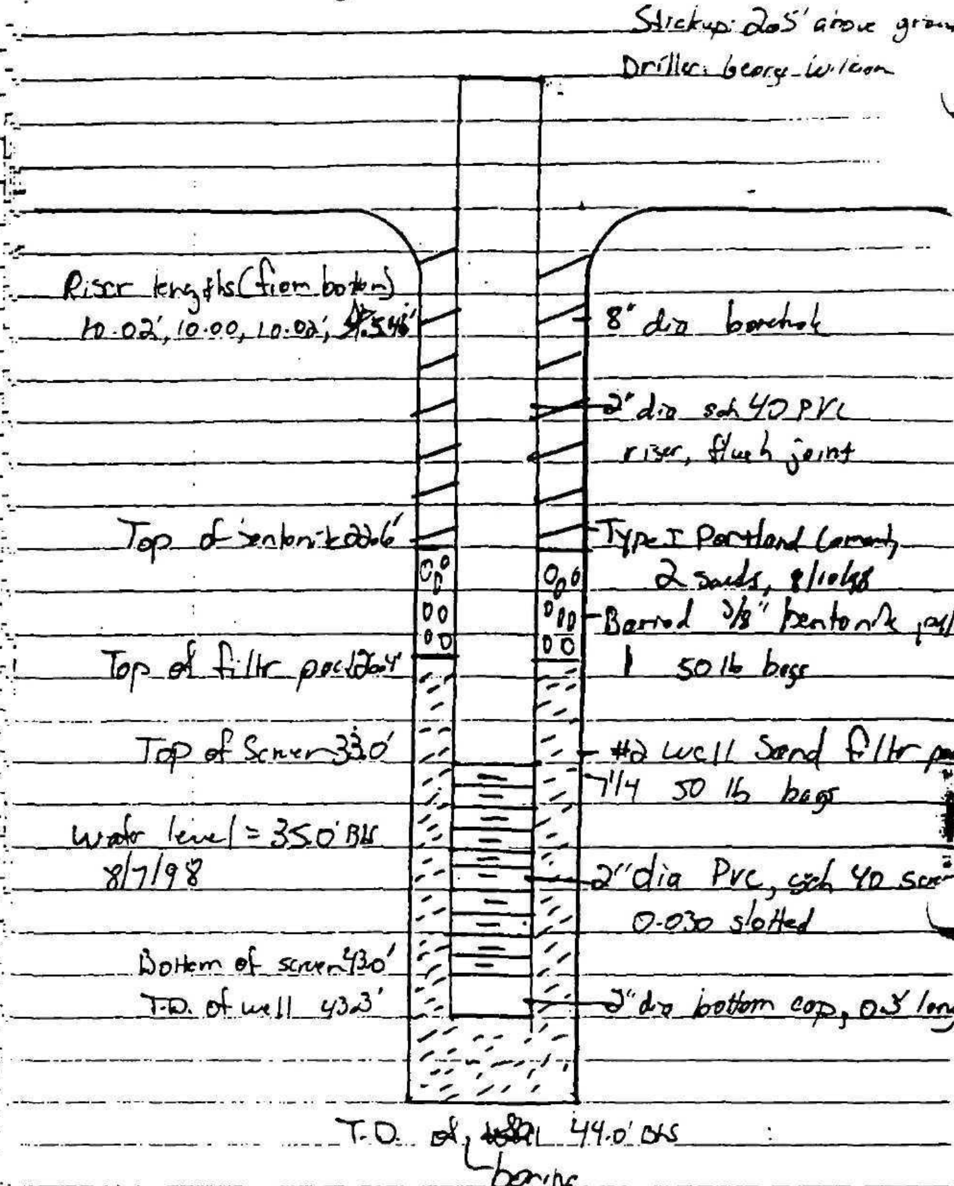
1600 Top of bentonite plug = 40.0' BLS, 1 1/2 - 50 lb bags.

1601 Add 5 gal of water to hydrate bentonite plug, pull remaining augers, demobilize, leave site. Drillers to decon pad. S. Martin back to office.

SJ
8/6/98

Allied Industrial Park

56 MW-62



Not To Scale

August 7, 1998 Weather: Hot, p.c.
Project: ALP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helper: Steve Hanson, ~~Dennis Creech~~ Mark Patterson
Technical Oversight: Scott N. Martin

0705 Calibrate PID
0710 Health & Safety meeting.
0750 Arrive at location MW-62; drillers set up decon pad, clear area, prepare to start sampling. S. Martin leaves site to run errand.
0840 Start sampling & augering.
1049 Water level = 37.5' BLS. Auger to 46.5' BLS, well screen will be placed between 35.5' and 45.5' BLS, contingent on other water level readings concurrently with this one.
1109 Water level = 35.0' BLS, screen interval to now be from 33.0' to 43.0' BLS.
1113 Clean out hole, pull augers, insert wood plug and push auger back down
1200 Lunch.
1228 Prepare to set well. Lengths are as follows (from bottom): end cap 0.3', screen 10.00', risers = 10.02', 10.00', 10.02', 10.02.
[33.0 + 2.5 = 35.5]
[35.5 - 30.04 = 5.46]
[5.46 - 2.50] = 2.96]
Note: Due to coarseness of sands in the screen interval we will use #2 well sand and 0.030' slotted screen. A field sieve analysis

A320

Dm 8/7/98

August 7, 1998

will be performed later to concur with this decision.

1321 5 50-lb bags of #2 sand brings top of pack to 32.0' BLS. Needs to be at 30.0' BLS.

1405 Top of filter pack = 26.4' BLS, 7¼ bags

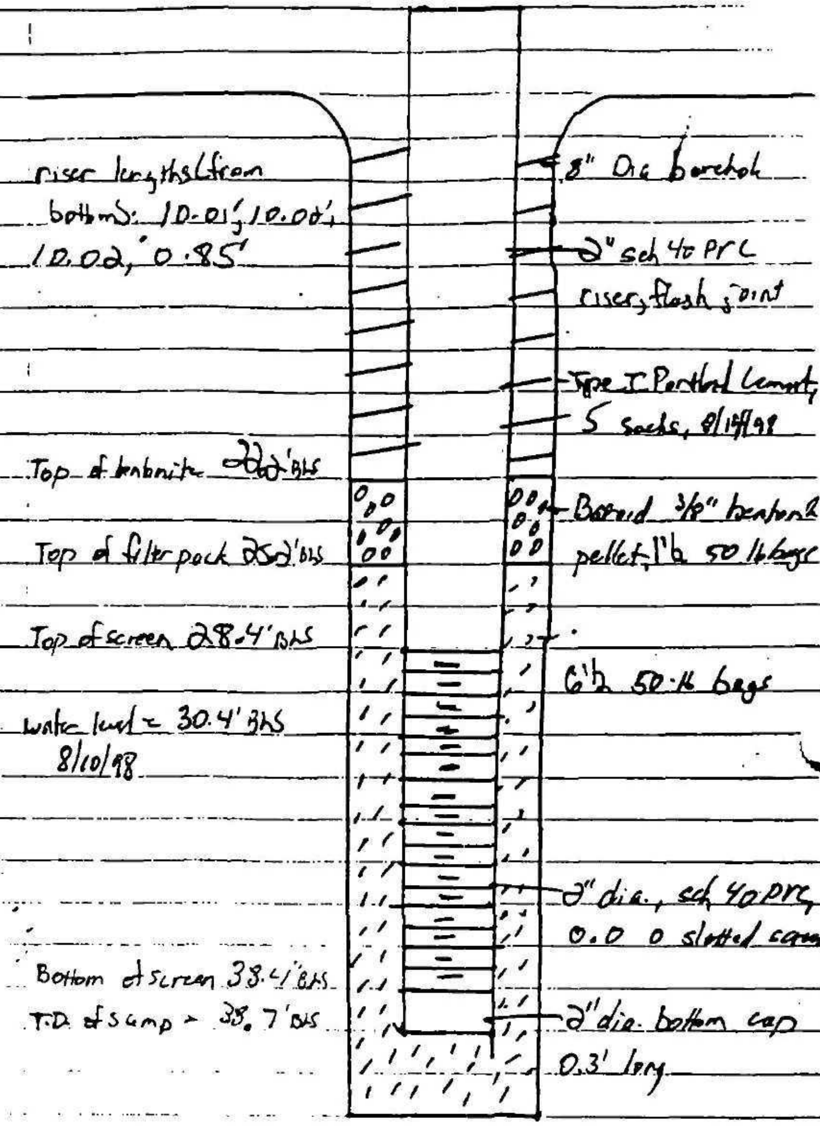
Note: Either have bridging of filter pack sand or some cave in of native sand. Attempted to push sand down using tremie and water, but to no affect. Will plug the well from 26.4' to 23.4' or thereabouts. A decision will have to be made later about whether or not this will be an acceptable well or have to be redone.

1411 Top of bentonite = 22.6' BLS following 1-50lb bag. Pull augers, demobilize, leave site. S. Martin to field office, Driller to Decon pad.

8/7/98

60 Allied Industrial Park
MW-73

Stickup = 2.5' above ground
Driller: George Wilkinson



Not to Scale T.D. of boring 40 BLS

August 10, 1998 Weather: Overcast, Warm

0730 Calibrate PID.
0740 Health & Safety Meeting

Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helpers: Steve Hanson, ~~Jim~~ Mark Patterson
Technical Oversight: Scott A. Morton

0817 Scott Morton's truck is stuck in a ditch, will pull out with chains. This done while looking for MW-73 location.
0842 Truck is no longer stuck. Setup drill rig, exclusion zone and prepare to start augering.
0909 Drive first sample, begin augering.
1020 Water level = 30.4' BGS.
1029 Water level = 30.4' BGS. Well to have a screen interval between 28.4' BGS and 38.4' BGS. Continue to extend borehole to 40.0' BGS. This will be T.D. of well. Pull augers, insert wood plug, drive augers back down boring.
1200 Lunch
1250 Back on site, riser lengths are as follows: bottom cap 0.3', screen: 10.00'; risers: 10.01', 10.02', 10.02', 10.01'.
28.4 + 2.5 = 30.9' = total riser.
30.9 − 30.05 = 0.85
36.5, 28.4 − 20.03 = ~~8.37~~ 8.37'
~~36.5~~ 36.5 = top of filter pack after 2 50lb bags.
Top needs to be at 25.4' BGS.

DM
8/10/98

August 10, 1998

34.1' BHS after 3 50 lb bags,
29.0' BHS aft 4 1/4 " " .
25.2' BHS - 6 1/2 50 lb bags
This is top of filter pack.

1411 Top of Bentonite = 22.2' BHS. (1 1/2 bags)
Pull remaining augers after hydrating bentonite. Demobilize, drill crew to decon pad. Scott Martin to office to turn over geotechnical samples.
Note: Drill rig stuck ~~in mud~~ on the slope leading to MW-73.

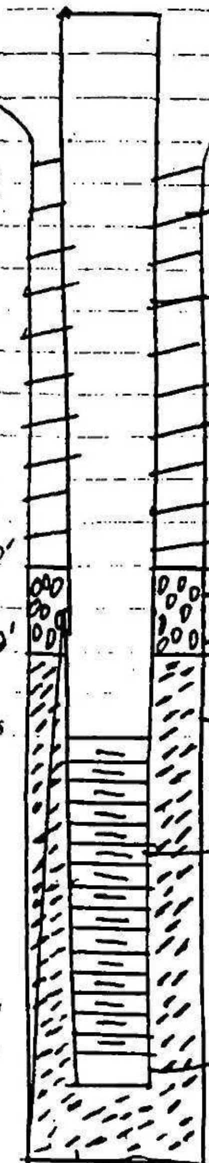
1535 Arrive at decon pad.
Note: Used 0.030 slotted screen and #2 well pack sand for filter pack

1625 Arrive at location MW-72. Setup drill rig mast, exclusion zone, prepare to start sampling and augering.

1655 Will start sampling first thing tomorrow morning.

8/10/98

Allied Industrial Park
MW-72



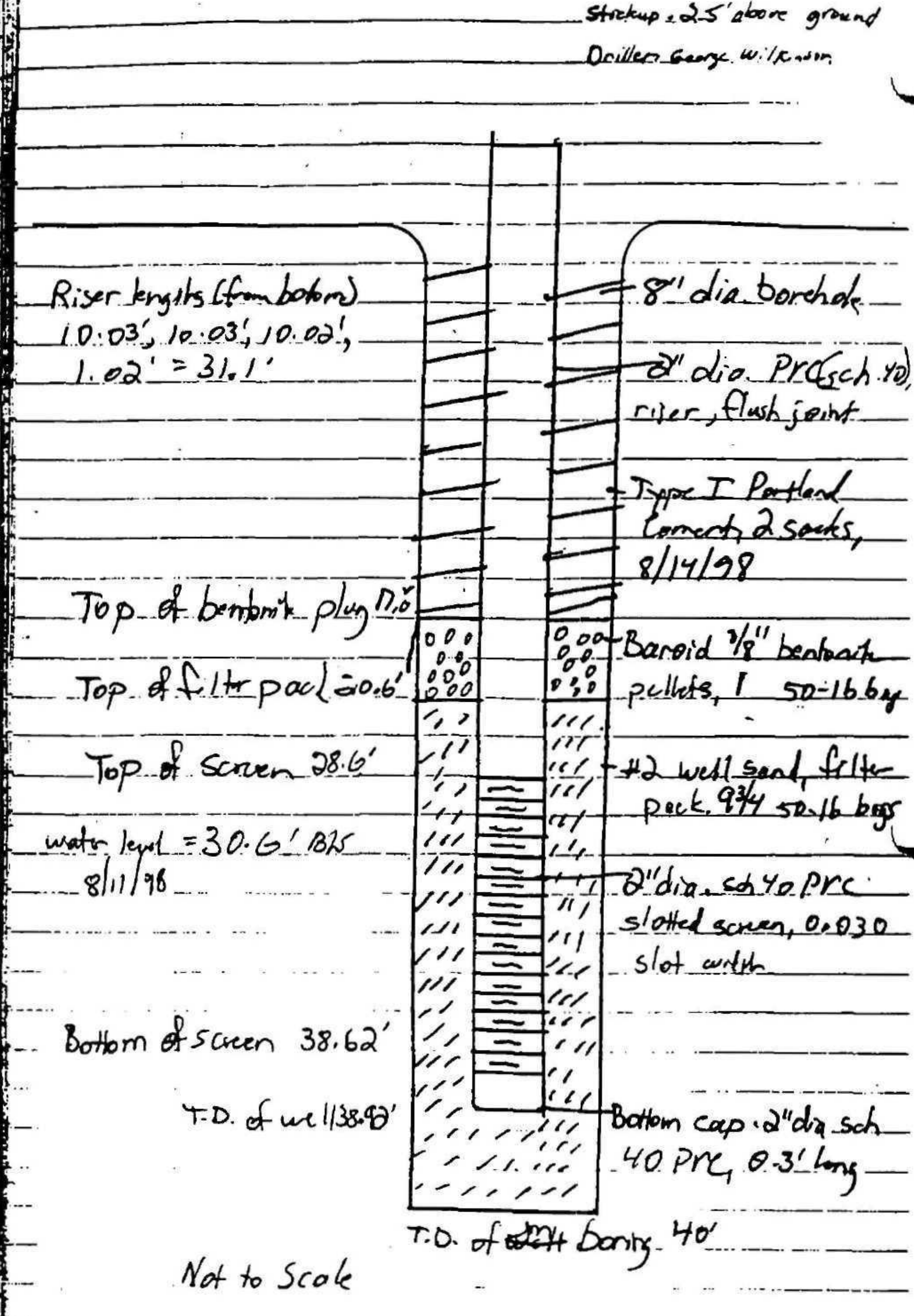
Not To Scale

August 11, 1998 Weather: Clear, Hot

Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helpers: Steve Hanson, Mark Patterson
Technical Oversight: Scott Martin

0705 Health and Safety meeting
0710 Calibrate PID
0725 Arrive at MW-72, waiting for drillers.
~~Start augering and sampling.~~ Drillers
went by decon pad to pick up drums
and other items.
0754 Begin driving splitspoon, auger 5'.
Note: PID is picking up a background
reading of 0.1 to 0.3 (fluctuating).
0842 Water level = 18.25 BGS, continue to
auger and sample to 28 BGS.
0930 Pull ~~rem~~ augers, insert wood plug,
reinsert augers. Screen interval to be from
16.25 to 26.25.
Note: Will be using 0.030 slotted screen
and #2 well sand.
[16.25 + 2.5 = 18.75 = total riser length]
Measurements are as follows: bottom cap = 0.3'
screen = 10.02', risers (from bottom) = 10.03', 10.02'
Mark at 6.22' and cut at 8.72' (2nd riser)
1028 22.57' is top of filter sand after 2
50 lb bags. Needs to be at 13.25'.
Top = 18.1' after 4 bags of sand.
1043 13.6' after 6 bags of sand.
1046 Top of ~~bentonite~~ ~~sm~~ filter pack = 13.22'
after 6 1/2 bags of #2 well sand.

66 Allied Industrial Park
MW-70



August 11, 1998
Top of bentonite plug = 10.0', 1 3/4 bags of bentonite plug unused

1055 Hydrate bentonite, pull remaining augers, demobolize, Drillers to decon. S. Martin to field office

1251 Setup on MW-70; prepare to auger.

1403 (1300 - start) After augering to 25' BLS, drill rig shutoff due to overheating. Temporarily waiting while rig cools off.

1430 Restart Augering.

1457 Water level = 30.6' BLS, Auger to 40' BLS.
Screen interval to be from 28.6' to 38.6' BLS.
[28.6 + 2.5 = 31.1 total riser]
Measurements are as follows: bottom cap = 0.3', screen = 10.02', risers (from bottom): 10.03', 10.03', 10.02', 10.02'
Note: This boring location is on top of backfill. Judging by nearby trees and slope of grade (natural), there appears to be between 5 and 10 feet of backfill.
[First 3 risers = 30.08' - 28.60' = 1.48']
[31.10 - 30.08 = 1.02']
Note: Using #2 Well Sand and 0.030 slotted screen

1612 Install well, begin adding filter pack sand.

1619 2-50 lb bags of sand = 35.9' BLS

1633 4 - " " " " = 28.6' BLS

1726 Sand was stuck between auger and well riser. Attempted to release using treme pipe. Unsuccessful. Pulled up augers. Will have to reset the well first thing in the morning.

8/17/98

DM
8/10/08

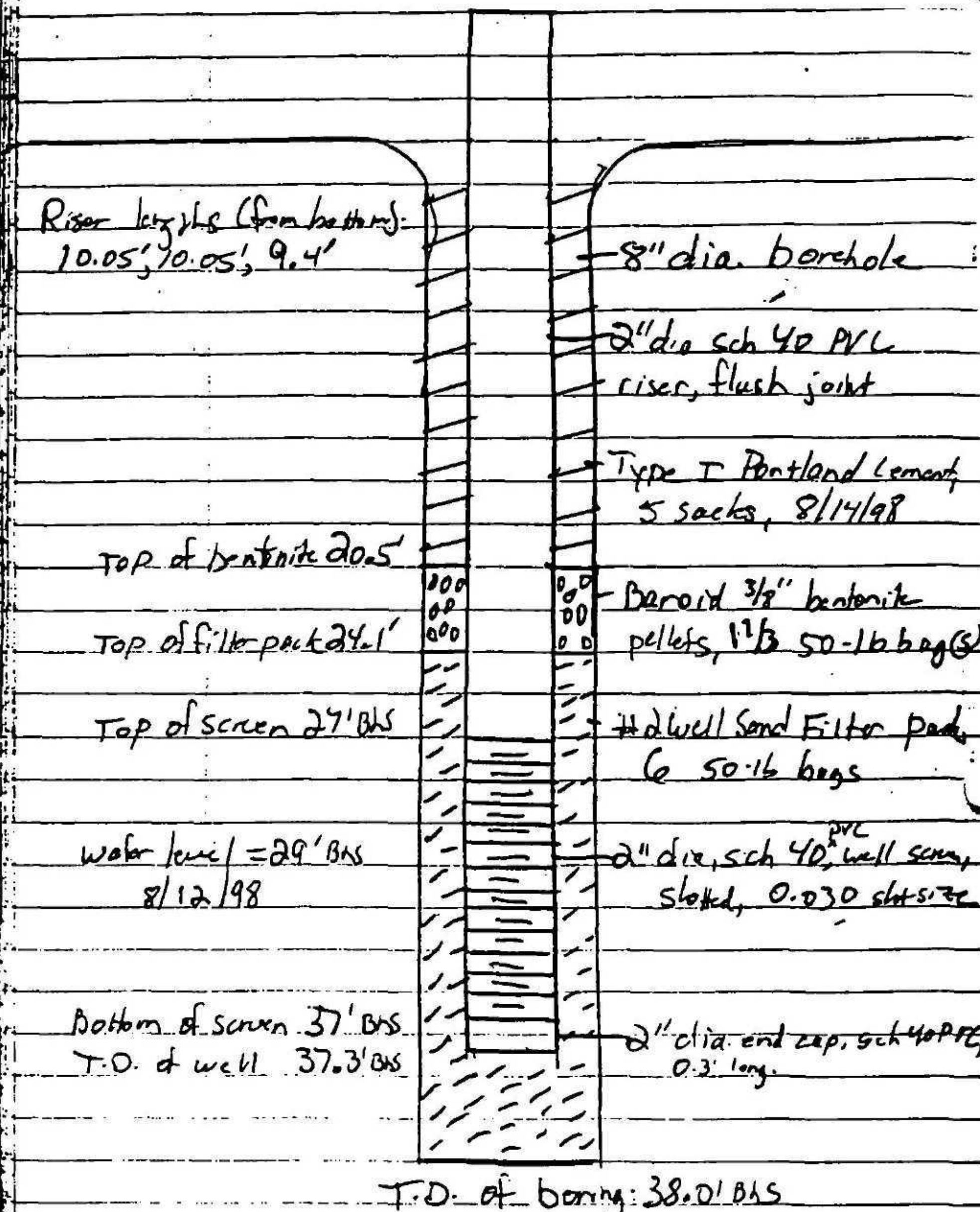
August 12, 1998 Weather: Warm, P. Cloudy

Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helpers: Steve Hanson, Mark Patterson
Technical Oversight: Scott Martin

0702 Calibrate PID
0710 Health & Safety meeting
0728 Arrive at MW-70 location, pull well riser and augers. Insert wood plug, re-insert augers and reinstall well.
0851 2 bags of sand = 35.8' BLS.
0913 4 bags " " = 23.6' BLS, obviously there is sand bridging in the augers again. Use tremie pipe to try to push sand down through augers.
1021 Hydrostatic pressure is pushing the sand up the augers. Having raised the augers while pushing with the tremie pipe, the sand would not release until the augers were at 20' BLS. Native sands as well as ~~the~~ well sand in the boring from the ~~3½~~ 5¾ bags we put in yesterday, ~~that~~ have filled the boring to ~~20.6~~ 20.6' BLS. ~~(well diagram in boring log)~~ Boring log indicates that native sands start between the 20'-22' and 25'-27' intervals. Believing that it is therefore safe to assume that only sand exists up to 21.6' BLS within the 8" boring, we will call 20.6' top of filter pack and plug with bentonite up to about 17.6' ~~18.0'~~ BLS.

70 Allied Industrial Park
MW-66

Stickup: 2.5' above ground
Driller: George Wilkinson



Not to scale

August 12, 1998

1034 Top of bentonite = 17.0' BLS using 1-50 lb bag of bentonite

1036 Demobilize, leave site. Drillers to decon pad. Scott Martin to field office and to speak with J. Furlow, lunch, misc

1250 Arrive at location MW-66, setup and prepare exclusion zone. Prepare to start augering.

1425 Water level = 29.0' BLS. Auger and sample in 2' intervals to 38.0' BLS. Screen interval to be from 27' BLS to 37' BLS.

1505 Due to recognition of common sand from aquifer and usual grain size distribution, going to use #2 well sand for filter pack and 0.030 slotted screen.

1535 Measurements for well length are as follows: (from bottom): bottom cap = 0.3', screen = 10.00', risers = 10.~~0~~57', 10.~~3~~57', 10.~~0~~57'
Calculation [27.0 + 2.5 = 29.5' BLS]
30.05 - 27.00 = 3.05

1608 Note: Due to hydrostatic pressure at last two wells in this vicinity, readings (tape depth) are not being taken following every 2 or 3 bags of sand. This is so the foot of sand in the bottom of the auger is not released.

1626 Top of filter pack = 24.1' BLS - 6 bags of #2 well sand (50 lb) used.

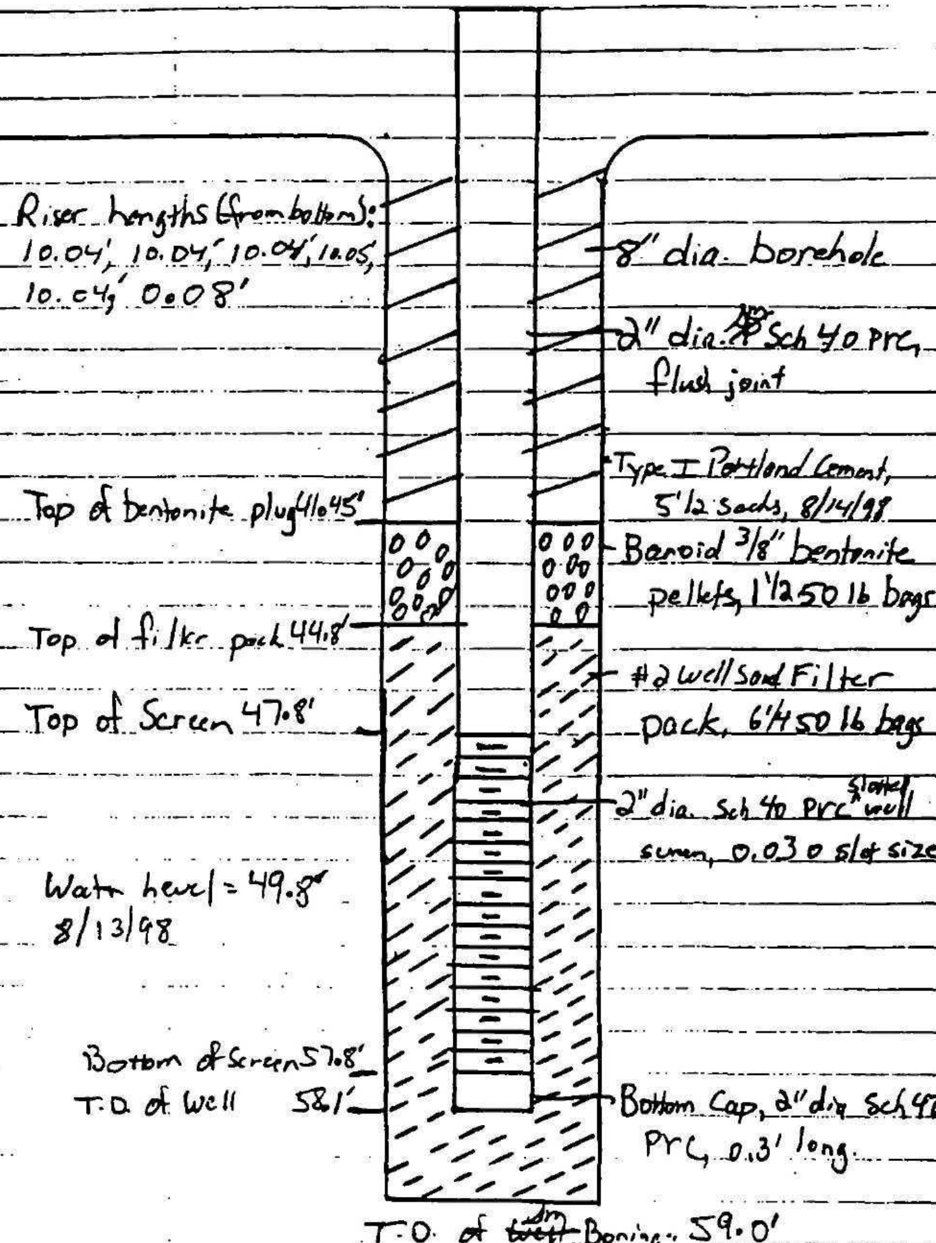
1637 Top of bentonite plug = 20.5' BLS, ~~only~~ 1 1/3 50-lb bags used.

1640 Hydrate, pull remaining augers, demobilize.

SM
8/12/98

Allied Industrial Park
MW-44

Stickup: 2.5' above ground
Drillers George Wilkinson



Not to
Scale

August 13, 1998 Weather: Hot, Overcast

Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helpers: Steve Hanson, Mark Patterson
Technical Oversight: Scott Martin

0707 Health & Safety meeting.
0712 Calibrate PID.

0724 Arrive at well location MW-44, setup exclusion zone, begin hand augering first five feet (0738), setup drill rig for sampling and drilling.
0853 PID readings: Breathing zone = 0.0 to 0.8 ppm
Point of Contact: 4.1 ppm maximum.
1058 Saturated Sample from 55-57' interval.
S. Martin leaves site to get water level meter from J. Furlow. Stop augering.
1117 S. Martin back on site. Water level = 49.8' BLS.
Since we have already sampled to 59' BLS we will stop there. Screened interval should be from 47.8' BLS to 57.8' BLS. Bottom of boring to be at 59.0' BLS.
Remove rods, break for lunch, go by office for George and I to call our offices. Stop at store for gatorade.
1300 Push augers to 59' to clean out hole, pull augers, insert plug and re drive augers.
Calculations: 47.8 + 2.5 = 51.3' of riser.
Well measurements are as follows (from bottom):
end cap 0.3', screen 10.00', risers: 10.04', 10.04', 10.04', 10.05', 10.04

Scott A. Martin
8/13/98

August 13, 1998

1310 Note: will be using 3.0 slot screen and #2 well sand for filter pack.

Second Last riser to be marked at [4.80 - 0.17 = 4.63] ~~± .25~~

0.22

Last Riser to be marked at [0.30' - ~~0.22~~ = 0.08'

~~This should be equal to .25~~

1350 Stop due to thunderclouds

1405 Start back, measure and insert well.

1509 4 bags of sand = 48.3' BLS

1522 Top of filter pack = 44.8' BLS, 6 1/4 50 lb bags of #2 well sand used.

1530 Top of bentonite plug: 41.45' BLS, 1 1/2 50 lb bags of bentonite used

1531 Hydrate, pull augers, demobolize. Drillers go to decon pad. S. Martin to field office.

S. Martin off site.

8/13/98

A338

[illegible] 8/14/98

August 14, 1998
Project: AIP Monitoring Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Helpers: Steve Hanson, Mark Patterson
Technical Oversight: Scott A. Martin

0706 Health & Safety meeting
0728 Drill crew and self (Scott Martin) go to decon pad to prepare to grout wells.
0816 Arrive at MW-69, 1st batch - 5 sacks cement (Portland type I), 15 lbs powdered bentonite (Quick-Gel by Baroid) 35 gallons of water. Batch weighs 13.6 lbs/gal.
0847 Arrive at MW-70, 1st Batch - 5 sacks cement, 35 gal water, 15 lbs bentonite. Weight = 13.55 lb/gal. Used 2/5 batch so 2 sacks, 6 lb bentonite, 14 gallons water
0919 Location MW-67, 2 1/2 sacks, 7 1/2 lbs bentonite, 17.5 gallons of water. Weight = 13.55 lb/gal
0932 Arrive at MW-66, 1st batch = 1/2 sacks 1.5 lbs bentonite, 3.5 gallons water, weight = 13.55 lb/gal
2nd batch = 5 sacks, 15 lbs bentonite, 35 gallons water. Weight = 14.5 lb/gal.
Used 4 1/2 sacks = 13.5 lbs bentonite, 31.5 gal water.
1002 Arrive MW-44, 5 1/2 sacks, 16.5 lbs bentonite, 38.5 gallons water. Weight = 14.2 lbs/gal.
1034 To decon pad for more water.
1049 Arrive at MW-73, 5 sack, 15 lbs, bentonite, 35 gallons of water. Weight 13.8 lb/gal.
1107 Arrive at MW-43. This ~~bom~~ well has been grouted once. It is now being topped off. Top of grout = 9.6'. 1 sack, 3 lbs bentonite and 7 gallons of water used. Weight = 13.8 lb/g

A340

[illegible]

8/14/98

79

August 14, 1998

1115 Scott Martin to field office, drillers clean up around decon pad.

End of Book DWA 12/4/98

August 6, 1998

0715 PW Albenesius (PWA) preparing to begin well development on MW-38, first well installed. Julius Twiggs of Alliance will be the well developer.

0730 Horiba calibration. Can't get pH to calibrate. Called Atlanta instruments and left message for them to call me.

0815 Spoke to Barry at AI and replaced internal calibration solution on instrument. Calibration complete

0845 To MW-38.

0900 Initial water level 57.12 FT below TOC.

The well screen is ~ 55 to 65 FT below TOC based on construction diagram. Therefore, there is 8 FT of head in the screen.

Purge volume calculations:

V_1 = casing (screen volume).
8.0 FT, 2" dia.
= 0.174 ft^3

V_2 = Filter pack volume in saturated zone.
PWA 10.0 ~~8.0~~ FT, 8" dia., ~~0~~ 0.30 porosity
= 3.49 ft^3 x .030 = ~~0.0~~ 1.05 ft^3

$V_3 = V_1 + V_2$ = 1.22 ft^3 x 7.48 gal/ft^3
= 9.13 gallons per well volume.
6 well volumes = 55 gallons.

0915 Electrical cord on pump doesn't reach bottom of well. PWA to Home Depot to buy additional wire.

0945 Added wire. Pump works but either won't push this much head or

Not Used 08/06/98 PWA

the yield of the well won't fill the hose.

1030 Moving to a shallower well.

1100 MW-56. Depth to water 33.03 below TOC. 2.5 FT stickup mark is ~ 0.15 FT below TOC.
Measured depth of well: 41.15 FT.
Head is ~ 8 FT.

1105 ~ 2 gpm. Very milky tan water.
After ~ 2 gpm pH = 6.12
Cond. = 0.503
Turb. = 603
DO = 10.60
Temp. = 23.7°C
Sal. = 0.02.

1110 Resumed pumping.
1115 5 gallons. Turbid.
1120 10 gallons pH = 6.23
Cond. = 0.211
Turb = 115
DO = 11.24
Temp = 22.5

1125 Resumed pumping. still turbid.
1130 15 gallons Temp = 22.0°C
Turb. = 93
DO = 11.34
pH = 6.22
Cond. = 0.204

1135 Break for lunch.
1245 Resumed pumping.
1300 After 25 gallons. Very clear.
Temp = 22.3°C

Not Used 08/06/98 DWA

pH = 6.24
Cond = 0.194 mS/cm
Turb = PWR ~~6.77~~ 65
DO = 11.29

1310 40 gallons. Then swabbed,
Turbidity = 85
Do = 10.72
Temp = 23.0°C
Cond. = 0.139
pH = 6.23

1315 50 gallons
Turbidity = 22
DO = 11.04
Temp = 21.7°C
pH = 6.18
Cond. = 0.186.

1320 Swabbed. First 5 gallons after swabbing is moderately turbid, then becomes very clear.
1325 60 gallons. Slightly to moderately turbid
1335 65 gallons. Slightly turbid to clear.
Turbidity = 22
Do = 11.48
Temp = 22.2°C
pH = 6.14
Cond. = 0.187
1340 70 gallons. Very clear.
1345 75 gallons. Very clear.
Turbidity 9
DO 11.24
Temp 22.2°C

Not Used 08/10/98 DWA

pH = 6.24
Cond. = 0.185
Development complete on MW-56.
1350 PWA to Wal Mart to buy flash camera for picture of water.
1430 Pumped another 10 gallons and filled mason jar for photograph.
1445 Set up backdrop and took photo.
1500 Deconned pump. Replaced garden hose with nylon tubing (3/8").
Decon process was liquinox wash, potable water rinse, deionized water rinse.

End 08/06/98

Begin 08/10/98
1300 Gary Vaughn from Pro 2 Serve will be following well development. PWA is introducing him to the process. Julius (AEI) will meet us at the decon area.
1315 Gary calibrates Horiba.
1330 Discovered that development pump had been stolen. Decided not to proceed with well development today.

End 08/10/98

PW
8/11/98

8/11/98

0916 Arrive @ MW 57
WL = 36.61 ft BTOC
X TD = 43.68 ft BTOC
WC = 7.07 ft
Dev. vol => 6.33 gal x 5 = 31.67 gal
pH ~~Cond~~ Turb Temp DO2 Vol
See Dev. form for info.
1032 Complete with 5 vol removed
1031 Arrive MW 48
MW48-WL = 38.62 ft BTOC
X TD = 49.61 ft BTOC
WC = 10.99 ft
Dev. vol = 9.84 gal x 5 = 49.23 gal total
all other data on dev. form.
1215 ~~Lunch~~ and Decon.
1325 Arrive MW 49
~~WL~~ WL = 37.45 ft BTOC
TD = 48.56 ft BTOC
X WC = 11.11 ft
Devel vol = 9.94 gal. x 5 = 49.71 gal
Other data on devel. form
1358 Arrive MW 35
WL = 46.41 ft BTOC
X TD = 55.06 ft BTOC
WC = 8.65 ft
Develop. vol. = 7.75 gal x 5 = 38.75 gal total
~~and decon~~ 8/11 Very soft bottom
will surge during all volumes
Pumps slow due to lg. vol. of sed.
~~Arrive MW 32~~
~~WL = 48.02 ft BTOC~~
~~TD = 56.22 ft BTOC~~
~~WC = 8.20 ft~~
~~[illegible] = 31. [illegible] total~~

8/12/98

0730 AM Water levels

Well #	WL	TD
MW 36	9.4	19.11
MW 39	-11.4 8/12 ~~9.40 8.4~~	8/11 ~~19.11~~ 22.8
MW 45	18.45	30.90
MW 49	29.09 8/12 ~~27.13~~	405 8/12 ~~35.20~~
MW 47		
MW 55	27.13	35.20
MW 37	31.83	40.03
MW 56	33.02	41.08

0840 Arrive MW 37
WC = 8.2 ft
Developement vol = 7.34gal x5 = 36.74gal
One drum on site

0943 Arrive MW-36
WC = 9.71 ft
Develop. Vol = 8.7gal x5 = 43.5
Well dry after 6gal., dark gray water with high vol. of fines. After removing one developement vol. will move to next well and return with bailer after decon on pumps.

1035 Bailer in MW-36

1038 Arrive MW 39
WC = 14.45
Develop. Vol = 10.25 x5 = 51.30gal
Well dry after 5.5gal and after every 3gal after 5 min. recharge

1145 Lunch while well recharges

1235 Return to MW 39 to pull pump
sed in well so heavy it must.

A352

8/12/98

be bailed.
Decon and move to MW32.
1410 Arrive @ MW32
WL = 48.02 ft BTOC
TD = 56.22 ft BTOC
WC = 8.20 ft
Develop Vol. = 7.34 gal x 5 = 36.7 gal
1454 Arrive @ MW56
WC = 8.04 ft
Develop. Vol = 7.22 gal x 5 = 36.10 total
1525 Arrive MW40
WC = 11.41 ft
Develop. Vol = 10.22 gal x 5 = 51.12
1630 Arrive to bail MW39 removed last of 3rd volume and 2 gal. of 4th before dry. Decon and return to office
Sample Management
2030 Begin
2230 Complete

8/12/98

8/13/98

0700 H & S tailgate

0735 Water level round

MW28	WL - 11.65	TD - 20.1
MW 29	61.6	69.6
MW 31	27.6	37.6
MW 47	42.2	50.1
MW42	48.2	56.6

0855 Arrive @ MW 29

WC = 8.0 ft

Develope Vol = 7.17 x 5 = 35.84 gal total

Cut riser to 2.5 ft AGS.

0945 Arrive @ MW-28

WC = 8.45 ft

Developement vol. = 7.57 gal x 5 = 37.86 total

1032 Arrive @ MW 31

W.C. = 10.0

Developement vol. = 8.96 gal x 5 = 44.8 gal

1222 Arrive MW 47

WC = 7.9

Developement Vol. = 7.08 gal x 5 = 35.39

1336 MW-47 complete - break for thunderstorm

1439 Arrive MW 42

WC = 8.4 ft

Development Vol. = 7.53 gal x 5 = 37.63 total

1529 Arrive MW55

WC = 8.07 ft

Developement Vol. = 7.23 gal. x 5 = 36.15 total

8/13/98

A354

8/14/98

0815 Arrive MW-36
WL = 15.06
TD = = 19.11
WC = 4.05
Developement Vol = 3.62 gal x 5 = 18.14
Will bail this well due to excess
sed. in sump.

0840 Note: Will spend morning
cleaning up sed. in MW-36,
39, and 45. ~~to~~ permit reg
developement with a pump on
8-17-98. Bailing would not
allow for necessary clearing
of developement sample.
MW-36 bailed dry after
4.5 gal. with clean sump.

0930 MW-39 bailed dry after
8 gal of water and Qt. of
Sand to a clean sump.

8/14/98

8/17/98

0700 H + S meeting
0730 AM Water levels

	M.Well #	WL BTOC	TD	WC
X	MW 30	37.05 ft	44.80 ft BTOC	7.75 ft
	MW 34	42.1	42.5	0.4 ft
	MW 38	57.3	64.8	7.5 ft
	MW 44	52.8	60.3	7.5 ft
X	MW 43	50.6	58.0	7.4 ft
X	MW 36	10.5	19.85	9.35 ft
X	MW 39	14.1	24.8	10.7 ft
X	MW 45	22.4	31.05	8.65 ft

0855 Arrive MW 30
WC = 7.75
Develop. Vol = 6.9 gal x 5 = 34.72 gal total
0956 Complete
1005 Arrive MW 38
WC = 7.5
Develop. Vol = 6.72 x 5 = 33.6 gal total
1052 Complete
1101 Arrive MW 43
WC = 7.4 ft
Devel. Vol. = 6.63 gal x 5 = 33.15 gal total
1132 Complete
1230 Lunch
1308 Arrive MW 45
WC = 8.65
Development Vol = 7.75 gal x 5 = 38.75 gal total
1356 Complete
Arrive MW 39
WC = 10.7
Development Vol. = 9.58 gal x 5 = 47.9 gal total
1557 Complete

8-17-98

8/18/98

~~0730~~ 0730 Arrive MW 36

0930 WC = 9.35 ft

Development Vol = 8.3 gal x 5 = 41.89 total

Complete under 6 hr rule

due slow recharge.

0800 W.L. Round for Development

MW 34	42.1	42.5
MW 44	52.8	60.3
MW 58	10 ft stickup	
MW 67	19.8	27.5
MW 69	42.9 –	49.1
MW 70	28.5	37.5
MW 71	9 ft stickup	
MW 62	34.4	41.3
MW 51	47.6	55.9
MW 66	28.5 –	
MW 63		
MW 56	33.05	41.08
MW 47	42.3 –	50.0

0945 Arrive MW 44

WC = 7.5 ft

Develop Vol = 6.72 gal x 5 = 33.6 total

1033 Complete

Arrive @ MW 36 and pump dry

1049 Arrive MW 51

WC = 8.3 ft

Development Vol = 7.44 gal x 5 = 37.18 gal

1133 Complete

1145 Arrive MW 36 and pump dry

1245 Arrive MW 34 and pump dry

with MW 39 and MW 45 due

to vandalism overnight.

8/18/98

1345 Arrive MW 72
TD = 28.2
WL = 20.8
WC = 7.4
Development Vol = 6.6gal x 5 = 33.15gal total

1428 Complete

1435 MW-72 remove 8gal. of water with heavy muck and sand before development in morning.

8/18/98

8/19/98

0700 H&S meeting
0735 Arrive MW 78
TD = 37.5 ft
WL = 28.5 ft
W/C = 9 ft
Devel. Vol. = 8.0 gal x 5 = 40 gal. total
See final note from 8/18/98.
Very slow recharge after 16 gal. removed. Pump surge (off/on) kept turbidity high.
0905 Complete
0952 Arrive MW 69
W.L = 42.9
TD = 49.1
WC = 6.2 ft
Development Vol. = 5.5 gal x 5 = 27.78 gal total
~~1001 Arrive MW 69~~
~~WL 42.9~~
~~TD = 49.1~~
~~Development Vol = 5.5 gal x 5 = 27.5 gal total~~
1348 Arrive MW 62
WC = 6.9 ft
WL = 34.4 ft BTOC
TD = 41.3 ft BTOC
Dev. Vol = 6.2 gal x 5 = 30.9 gal total
1504 Complete
1531 Arrive MW 58 - cut to 2.5 ft AGS
WL = 37.3 ft
TD = 44.4 ft
WC = 7.1 ft
Dev. Vol = 6.36 gal x 5 = 31.8 gal total
1615 Complete

8/20/98

0700 H+S meeting
Walmart with development film - roll 1
0845 MW-63 WL - 7.1 TD - 15.1
MW-66 32.25 39.5
MW-67 21.8 29.9
MW-73 30.25 36.3
0920 Arrive MW 73
WC = 6.05
Development Vol = 5.4 gal x 5 = 27.1 gal total
1015 Complete
Arrive MW63
Heavy sand in well, will bail till removed. 6 gal. removed before beginning development.
WC = 8.0 ft
Development Vol = 7.2 gal x 5 = 35.8 gal total
1114 Complete - Water clear of well material but stained green/gray.
1117 Arrive MW 66
WC = 7.25 ft
Development Vol = 6.5 gal x 5 = 32.5 gal
Bailed 13 gal. (2 vol.) to remove fine sand from well and begin pump and surge.
1205 Complete
Lunch and pick up photos
1201/1700 Complete sieve tests @ field office.

8/20/98

8/21/98

0700 Finish photos of development water (logged below)

Well Number	Roll/Exposure#	Final Turbidity (NTU)
MW 56	1 - 27	
MW 57	1 - 26	
MW 48	1 - 23	
MW 49	1 - 22	
MW 28	2 - 27	
MW 35	2 - 26	
MW 42	2 - 25	
MW 29	2 - 24	
MW 43	2 - 23 & 2 - 13	
MW 70	2 - 22	

8/21/98

8/24/98

0700 H+S meeting

0801 Label development, decon sludge, and soil cutting drums near staging area.

1001 MW-28 check well for vandalism and pump until clear. No objects in well with clean bottom; pumped until clear ≈ 11 gal.

Daily water levels

MW 71	WL 17.4	TD-24.2
MW 60		
MW 41	WL 41.5	TD 49.6
MW 68	WL 49.7	TD 59.1
MW 67	WL-21.8	TD-29.9
MW 64		
MW 65		

1032 Arrive MW 67
WC = 8.1 ft
Development Vol = 7.25 gal x 5 = 36.29 gal total

1105 Complete
Lunch and Walmart

1303 Arrive MW 71
WC = 6.8 ft
Develop Vol = 6.09 gal x 5 = 30.5 gal total

1351 Complete

1354 Arrive MW 68
WC = 9.4 ft
Devel. Vol. = 8.4 gal x 5 = 42.1

1458 Complete

8/24/98

1511 MW/6l
WC = 8.1 μl
Develop Vol = 7.25 x 5 = 36.3 μl total
1613 Complete
1648 Sieve tests and lists for PWA

[illegible]
8/24/98

8/25/98

0700 H&S meeting
0715 Water Levels for development
MW-34R WL - Dry AGS TD-48.4 AGS
MW-60 48.03 BTOC 56.05
MW-64 31.4 BTOC 38.3 BTOC
MW-65 38.6 BTO 46.4 BTOC
Development Volumes
0911 MW-60 - WC = 8.02 ft
Devel. Vol = 7.2 gal x 5 = 35.9 gal total
1013 MW-64 - WC = 6.9 ft
Devel. Vol. = 6.2 gal. x 5 = 30.9 gal total
MW 65 - WC = 7.8 ft
1150 Devel Vol = 7 gal x 5 = 35 gal total
1230 Lunch, Home Depot, Walmart,
Office Max and of course the bank.
1400 Begin jetting MW 34R,
Water level = TD
Using 40 gal. jet well and remove
by pumping well dry.
1540 Complete
Check water level in MW-34R
WL = TD will not work

8/25/98

A364

8/31/98

0700 H&S meeting
0720 Arrive MW 34R
WL. = 52.41' BTOC
TD = 59.87' BTOC
W/C = 7.46 ft
Development Vol = 6.7 gal x 5 = 33.4 gal Total
0814 Complete - Stickup = 2.09 ft AGL
MW- has not been
grouted and will not be
developed before 9/2/98
0855 Will check TD measurements
on Industrial Area Wells
for spreadsheet

8/31/98

9/1/98

0615 Photos of development and core boxes filed

0700 H+S

0800 Sediment removal from MW 73.

TD = 39.74 ft BTOC

TD after 5 gal bailed 35.~~7~~

TD after 5 gal bailed 35.~~7~~

BTOC - feels as if Tagline is falling through very fine muck that the bailer will not pick up because the set ball will not seat. Bailer stopping @ 37.64 BTOC.

Pump 15 gal. and bail 3 gal = TD = ~~35.~~ BTOC

38 gal total removed 35.05 BTOC hard bottom. Moved to MW 72 after meeting with Jim Furlow @ well.

1001 Arrive MW 72

TD = 27.57 ft BTOC

after bailing 27.56 TD and 10 gal. TD = 27.58

after 5 gal. - 5 gal. removed

27.56 BTOC - 5 gal removed

water clearing - TD = 27.58

Stickup = 2.21 ft

9/1/98 [signature]

A366

9/1/98

1253 Arrive MW 64
TD = 38.18' BTOC remove
15 gal bailing and 5 by pump
TD = 38.18' BTOC
28 gal removed TD has
not changed - will try
0.75" pvc to brakeup sediment
1418 Arrive MW73 and try
pvc pipe and bail every
0.5'.
TD = 35.05 remove 5 gal
by bailer, TD = 35.96 ft
remove 5 gal by bailer
35.[illegible] ft
1540 Arrive MW 72
TD = 27.58' BTOC removed
5 gal after braking up sediment
with pipe slug TD is
27.58' BTOC. New method
for next try. TD 25.38' BGL.
1600 Clean up and off site

[signature] 9/1/98

9/2/98

0700 WL's
MW 33 - 42.79' BTOC - TD 51.3'
MW 34R - 52.41' BTOC - TD 58.3'
0740 Arrive MW 34R to clear bottom TD = 60.8' BTOC per drilling log.
1^{st} TD = 60.4' BTOC bailing 5 gal
2^{nd} TD = 60.1 BTOC pump 5 gal.
3^{rd} TD = 60.7 BTOC bail 3 gal
4^{th} TD = 59.88 BTOC. Bailer does not seat due to fines will wait for new bailer due @ lunch.
0921 Arrive MW 33 - 1^{st} TD = 49.9'
check for sieve sample @ landfill
0928 Begin development on MW 33
WL = 42.79' BTOC
TD = 49.9 BTOC
WC = 7.11 ft.
Development Vol = 6.4 gal. x5 = 32 gal total
1020 Complete
Pickup sample @ MW 12 in the landfill for sieve test

26

9/9/98

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9/9/98

0700 SAFETY MEETING + LOAD EQUIP'T

0730 MOBE B-K PUMP TO MW-73.
B. KRISTIANSEN + M. GILCHRIST
ON SITE - CURRENT TAG 34.62'
TOC (~6.58' SAND IN WELL)
INSTALL B-K PUMP

0750 SAND LOCKED PUMP - RETURN TO
PAD TO CLEAN OUT

0800 REINSTALL PUMP - VERY TURBID
W/HIGH COARSE SAND

0840 SAND LOCK PUMP - PULL + CLEAN

0900 REINSTALL - PUMP OUT SAND TO
BOTTOM, PULL 5' OFF, PUMP
TIL MOSTLY CLEAR - (~65 GALS)

0945 PULL PUMP - FINAL TAG ~~40~~ 39.3 TOC

1010 DEPART FOR MW-33, CURRENT
TAG 49.99 (~~~3.8'~~ ~1.3' SAND IN WELL)

1020 MW-33 - INSTALL PUMP - REMOVE
~50 GALS (MOD TURBIDITY)

1125 PULL PUMP - FINAL TAG 51.2',
ORIGINAL DEPTH 51.3' TOC

1145 PICK UP LOGS FROM J. FURLOW
CLEAN DEVELOPMENT PUMP

1245 REINSTALL BK PUMP IN MW-73
PUMP ~75 GALS - FINAL TAG 41.0' BTOC

1330 MOBE TO MW-34R
CURRENT TD 59.16 (~1.64' SAND) - INSTALL
BK PUMP - PURGE ~40 GALS + SAND
FINAL TAG 60.8' - NEEDS PUMPING
TO REDUCE TURBIDITY

1545 MOBE TO MW-71 25.80 ACTUAL DPTH.
CURRENT 24.49 (~1.31' SAND) - PUMP OUT
SAND & ~50 GALS / CLEAR - TAG 25.80

B Kurt Hansen 9/10/98

9-10-98

0700 SAFETY MEETING, PACK SAMPLES
0745 INSTALL PUMP IN MW-29 -
TAG - 68.45, V. TURBID - PURGE
~40 GALS, WELL CLEAR, NO SAND
RETAG BOTTOM @ 68.45' TOC
0900 MOBE TO MW-35 - INITIAL TAG
55.39' (~0.41' SAND) V. TURBID
PURGE ~45 GALS H_2O & SANDY CLAY
REMOVE ALL SAND - PUMP TILL CLEAR
FINAL TAG - 55.80' TOC
1030 MOBE TO MW-57 - INITIAL TAG
44.09 (~0.76' SAND) V. TURBID
PURGE ~75 GALS H_2O & SAND - CLEAN OUT,
SUMP - PUMP TILL CLEAR - FINAL TAG - 44.82' TOC
1145 MOBE TO MW-48 - INITIAL TAG 48.63'
(~0.20' SAND) V. TURBID - PURGE
~55 GALS H_2O & COARSE SAND - PUMP
TILL CLEAR - FINAL TAG 48.81'
1330 MOBE TO MW-58 - INITIAL TAG 44.39'
(~0.41' SAND) V. TURBID - PURGE
~60 GALS H_2O & V. COARSE SAND - PUMP
TILL CLEAR - FINAL TAG - 44.80'
1445 MOBE TO MW-28 - INITIAL TAG 20.41'
(~0.94' SAND) V. TURBID - PURGE
~50 GALS H_2O / COARSE SAND, - PUMP
TILL CLEAR - FINAL TAG - 21.33'
1545 LABEL DRUMS FOR PURGE WATER
CLEAN UP SITES, SET UP MW-32
1700 DEPART SITE

[signature] 9/10/98

B Kuethaman 9/1/98

9/11/98

0700 SAFETY MEETING - LOAD UP

0715 MOBE TO MW-37 - INITIAL TAG 56.52' (~0.28' SAND) V. TURBID PURGE ~ 55 GALS H_2O & SAND - H_2O BARELY CLOUDY - FINAL TAG - 56.70' TOC

0830 MOBE TO MW-40 - INITIAL TAG 40.77 (~1.03' SAND) V. TURBID PURGE ~ 75 GALS H_2O & SAND - PUMP TIL CLEAR - FINAL TAG 41.70

0945 MOBE TO MW-63 - INITIAL TAG 15.42' (~0.38' SAND) V. TURBID, DK. BROWN - PURGE ~ 50 GALS H_2O + MED. SAND - PUMP TILL SL. MILKY (FORMATION COLOR-ORG.) FINAL TAG - 15.80'

1030 MOBE TO MW-72 - INITIAL TAG - 27.61' (~1.46' SAND) V. TURBID, COARSE SAND + WHITE CLAY - PURGE ~70 GALS TIL CLEAR - FINAL TAG - 29.05

1245 LABEL REMAINING DRUMS - EMPTY TRASH BINS

1400 UNLOAD & DEPART SITE

[signature] 9/11/98

A374

9/14/98

9/14/98

0700 SAFETY MEETING - LOAD EQUIPMENT
0720 MOBE TO MW-43 - INITIAL TAG 58.61' (~0.19' SAND) V. TURBID WHITE W/ COARSE SAND - PUMP ~50 GALS TIL CLEAR - FINAL TAG - 58.76' TOC
0840 MOBE TO MW-44, INITIAL TAG 59.84' (~0.76' SAND) V. TURBID, MILKY W/ COARSE SAND PURGE ~50 GALS - SLIGHTLY MILKY FINAL TAG 60.60' TOC
0930 MOBE TO MW-60, INITIAL TAG 56.30' (~0.50' SAND) V. TURBID PURGE ~50 GALS H_2O & COARSE SAND FINAL TAG - 56.80' TOC
1030 MOBE TO MW-61 - INITIAL TAG 50.20' (~0.60' SAND) V. TURBID, TAN W/ COARSE SAND - PURGE ~50 GALS TILL SLIGHTLY CLOUDY - FINAL TAG - 50.72
1200 MOBE TO MW-62 - INITIAL TAG 44.07' (~1.73' SAND) VERY TURBID - LOOSE COARSE SAND - PURGE ~60 GALS H_2O + SLOW RECOVERING WELL, INITIAL PURGE DRY IN 15 MIN, ~5 MIN TO RECOVER + PUMP 3-4 MINS, FINAL TAG 45.55
1430 MOBE TO MW-67, INITIAL TAG 30.38 (~0.42' SAND) V. TURBID - TRACE SAND - PURGE ~60 GALS, LIGHTER BUT STILL MILKY - FINAL TAG 30.30' (CASING APPEARS TO BE ONLY 2.0' AB. GRND.)
1545 RETURN TO CLEAN PIPE

9/14/98

[signature]

A376

9/15/98

9/15/98

0700 SAFETY MEETING - LOAD SUPPLIES
0710 INSTALL LOCKS MW-61, 62, 67
0730 MOBE TO MW-68, INITIAL TAG 60.56' (~1.24' SAND) V. TURBID, COARSE SAND - PURGE ~100 GALS - NO SAND & SLIGHTLY MILKY - FINAL TAG 61.70'
0900 MOBE TO MW-65, INITIAL TAG 36.90' (~0.90' SAND) V. TURBID & COARSE SAND - PURGE ~80 GALS NO SAND, STILL LT. YELLOWISH COLOR FINAL TAG - 37.75'
1030 PICK UP DRUMS, DECON, FINAL + HORIBA WATER QUALITY PROBE MOBE TO MW-12
STATIC W - 5.09' TOC
INITIAL TAG - 17.60' TOC
EST DEPTH - 18.80' TOC
1115 INITIAL MEASUREMENTS AFTER 15 GALS pH 5.00 COND 194 TURB - 999+ DO 2.32 TEMP 20.7°C V. TURBID
1125 V. TURBID LT. YELLOW @ 55 GALS pH - 4.97 COND - 183 TUR. - 999+ DO - 2.24 TEMP - 20.3°C
1140 V. TURBID LT. YELLOW @ 100 GALS pH 4.97 COND 184 TURB 999+ DO 1.89 TEMP 20.1°C
1155 V. TURBID (FORM.) LT. YELLOW @ 150 GALS pH - 5.04 COND - 185 TURB - 999+ DO - 2.01 TEMP 20.1 / TAG - 18.80' TOC
1200 PULL PUMP - TO DECON - RETURN TO SHOP - PICK UP DRUM & HEAD TO LANDFILL

A378

RECORD

Macon Naval Ordnance Plant
(MNOP)
Book No. 5

pp 1-147

August 10, 1998 –
October 9, 1998

Plus re-sampling
of DSL-113 and [illegible]
and FDW disposal
March 6, 1999 –
July 23, 1999

August 10, 1998 Weather: Cloudy, warm
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Nathan Coleman
Technical Oversight: J. Furlow

0705 J. Furlow and some Alliance personnel on site at SAIC field office
0715 Microtip IS-3000 PID calibrated.
0805 All personnel on site
0810 J. Furlow conducts daily Tailgate Health & Safety briefing.
0820 Preparing to grout up all wells installed last week.
0830 Drill crew going to Home Depot for a pallet of cement.
1005 Drill crew back with load of cement. Moving to MW-55.
1010 Top of bentonite seal in MW-55 tagged at 10.5' bls.
1015 Mixing grout: 3 sacks of Type I Portland cement, 9 lb. of bentonite, 21 gal of water. Grout weight is 14.2 lb./gal.
1025 MW-55 grouted up to ground surface.
1030 Moving to MW-45. Seal tagged at 10.4' bls.
1045 MW-45 grouted up to within 2 feet of ground surface: grout mix is 2 sacks of cement, 6 lb. bentonite, 14 gal. of water. Grout weight is 14.2 lb./gal.
1048 Moving to MW-39.
1050 MW-39 tagged at 3.5' bls. Pad crew will grout up when they install pad. Moving to MW-43.

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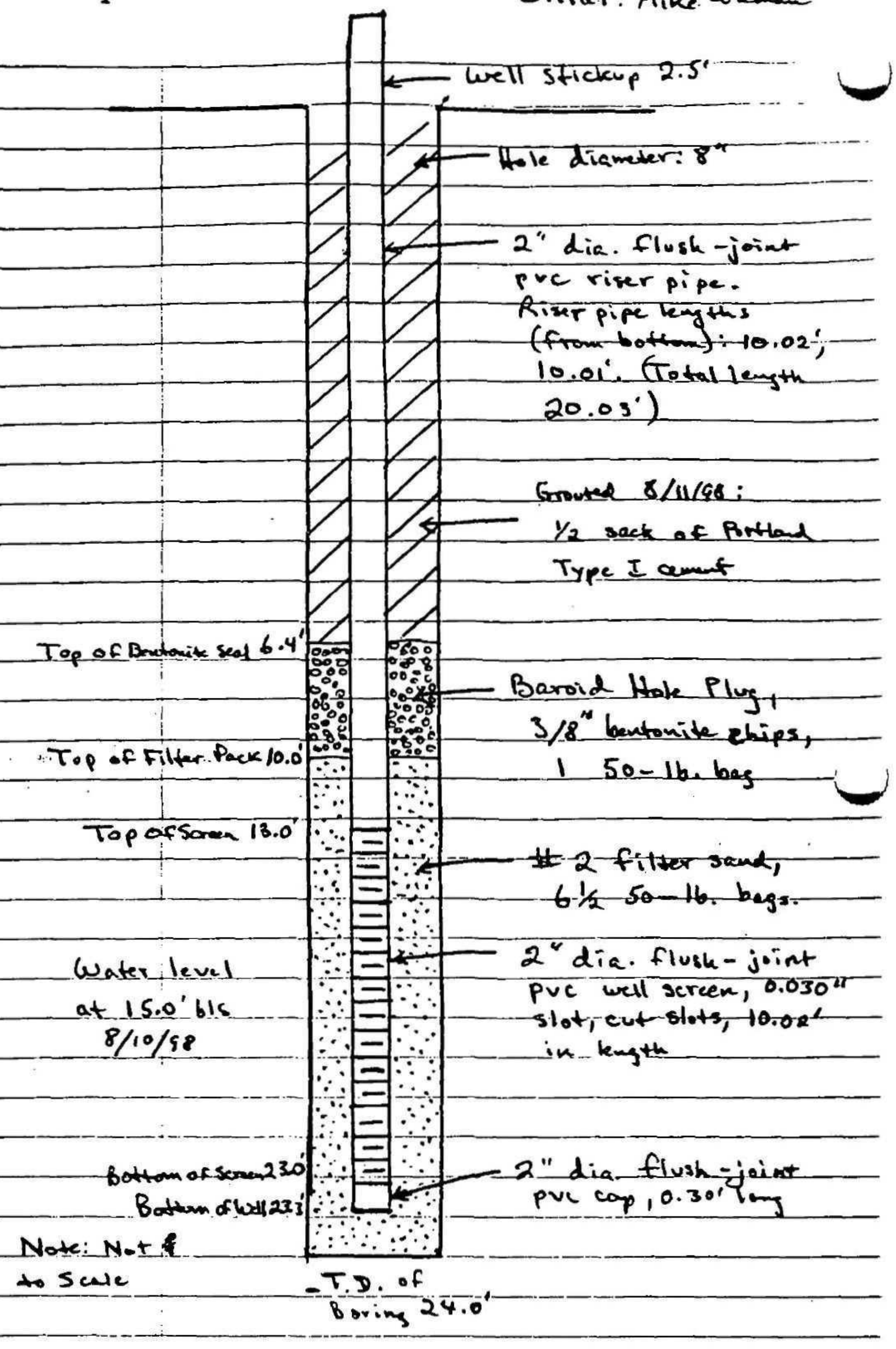
J.W. Fowler 8/10/98

August 10, 1998
1055 MW-43 bentonite seal tagged at 34.1' bls.
1058 Mixing grout for MW-43. Grout mix:
7 sacks of cement, 21 lb. of bentonite, 50 gal.
of water. Grout weight 13.7 lb./gal.
1108 Grout pumped into MW-43. Grout rose
to within 1 foot of ground surface.
1115 Drill crew filling up water tank on drill rig.
1123 Moving to MW-51. Top of seal tagged
at 34.0' bls.
1141 MW-51 grouted to within 4 feet
of ground surface. Grout mix of first
batch: 5 sacks of cement, 15 lb. bentonite,
35 gal. of water. Grout weight 13.8 lb/gal.
Mix of second batch: 3 sacks of cement,
9 lb. bentonite, 21 gal. of water. Grout weight
was 13.3 lb./gal.
1145 Moving to MW-62.
1150 Top of seal/fill in MW-62 tagged
at 10.5' bls. Begin mixing grout for MW-62.
1157 Grout pumped to ground surface. Grout
mix: 2 sacks of cement, 6 lb. bentonite,
14 gal. of water. Grout weight was 13.3 lb/gal.
1200 All wells grouted. Breaking for lunch.
1205 P.W. Albenesius on site.
1320 Mobilizing drill rig to MW-71 location.
1355 Drill crew setting up on MW-71.
1410 Begin drilling/Sampling on MW-71.
1500 Drilled/sampled depth 19'. Water level
measured at 15.0' bls. Drilling stopped so that
drill crew can go help get other drill rig unstuck.
1530 Other drill rig unstuck.
1600 MW-71 drilled to total depth of 24'.
Screen to be set from 13'-23'. Using 20-slot

4 MW-71

Well installed 8/10/98
Driller: Mike Coleman



August 10, 1998
screen and #2 filter sand.
1636 Deconning well screen and riser pipe on site by steam cleaning. Well screen: 2" dia. flush-joint pvc, 30 slot (0.030"), cut slots, 10.02' long.
Riser pipe: 2" dia. flush-joint pvc; lengths 10.02', 10.01'. Total length of riser: 20.03'. Bottom cap: 2" dia. flush-joint pvc, 0.30' long.
1640 Bottom cap, screen and riser pipe installed in well. Begin installation of filter pack (#2 filter sand). Approximately 5 gallons of water used initially to wash sand down. Screen set at 13.0'-23.0'.
1658 Top of filter pack tagged at 10.0' bls.
6 1/2 50-lb sacks of #2 filter sand installed.
1702 1 sack (50-lb) of Baroid Hole Plug 3/8" bentonite chips installed in well. Top of bentonite seal tagged at 6.4' bls. Approximately 5 gal. of water added to hydrate bentonite chips.
1710 J. Furlow to SAIC field office.
1720 J. Furlow and P. Albenesius go to decon area/drum storage area to remark drum labels.
1820 J. Furlow and P. Albenesius look at proposed locations of MW-60 and MW-61.
1850 P. Albenesius off site to Aiken.
1915 J. Furlow off site for the day

J. W. Furlow
8/10/98

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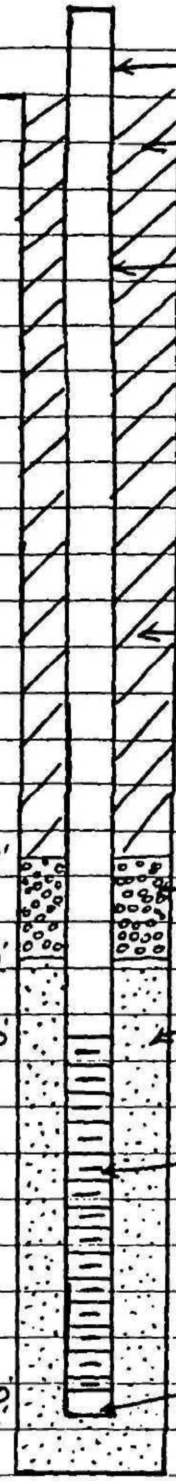
J.W. Jordan 8/11/98

August 11, 1998 Weather: Cloudy, Hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helpers: Nathan Coleman
Oversight: Jim Furlow

0700 All personnel on site
0715 J. Furlow conducts daily Health & Safety Tailgate briefing.
0720 Microtip IS-3000 PID calibrated.
0730 J. Furlow takes Gary Vaughan to wells that are ready to be developed. Drill crew deconning rig and drill tools.
0830 Rig and tools deconned. Moving to MW-33.
0845 Setting rig up on MW-33.
0905 Unable to set rig up in a stable or safe position on MW-33. Moving to MW-58 until I can talk to P. Albevesius about MW-33.
0913 Setting up drill rig on MW-58.
0935 Begin drill/sampling on MW-58 location.
1130 Breaking for lunch. Drilled depth 40 feet. Water level at 35.0' and rising.
1220 Water level in MW-58 boring measured at 34.57' bls. Screen to be set at 32'-42' bls.
1228 Resuming drilling/sampling to T.D. of 43'
1245 MW-58 drilled to T.D. of 43'. Preparing to install well; deconning screen and riser pipe.
Bottom cap: 2" dia. flush-joint PVC, 0.30' long.
Well screen: 2" dia. flush-joint PVC, cut slots, 0.030" slots, 10.02' long.
Riser pipe: 2" dia. flush-joint PVC; lengths (from bottom up): 10.03', 10.02', 10.03', 10.03' (Total of 40.11').

8 MW-58

Installed 8/11/98
Driller: Mike Coleman



Well stickup 2.5'

Hole diameter 8"

2 in dia. flush-joint pvc riser pipe. Riser pipe lengths (from bottom up): 10.03', 10.02', 10.03', 10.03' (Total 40.11')

Grouted 8/11/98:
5 sacks of Portland Type I cement

Top of Bentonite Seal 26.7'

Baroid Hole Plug 3/8" bentonite chips, 1 50-lb bag

Top of Filter Sand 29.2'

#2 filter sand, 5½ 50-lb bags

Top of Well screen 32.0'

Water level at 34.57' 8/11/98

2" dia. flush-joint pvc well screen, cut slots, 0.030" slot, 10.02' in length

Bottom of Well Screen 42.0'
Bottom of Well 42.3'

2" dia. pvc bottom cap, flush-joint, 0.30' long

Note: Not to Scale

T.D. of Boring 43.0'

August 11, 1998

1255 Bottom cap, well screen and riser pipe installed in well. Screen set at 32'-42' bls.
Begin installation of #2 filter sand.
1300 Approximately 5 gallons of water added to well to wash initial sand into boring.
1318 Top of filter sand tagged at 29.2' bls.
5½ 50-lb. sacks of #2 filter sand installed.
1323 1 50-lb. sack of Baroid Hole Plug 3/8" bentonite chips installed in well. Top of bentonite tagged at 26.7' bls. Approximately 5 gallons of water added to well to hydrate bentonite.
1330 Rigging down to decon drill rig and tools.
1345 Samples: 34'-36', MW-58-1 (Atterberg, Moisture)
38'-40' MW-58-2 (Grain Size Dist)
1450 Deconning of drill rig and tools completed. Moving to MW-72 to grout well.
1500 Top of seal/fill in MW-72 tagged at 7.9' bls. Begin mixing grout.
1505 Grout mixed and pumped. Grout mix: 2 94-lb. sacks of Type I Portland cement, 6 lbs of bentonite (Quick-Gel), 14 gal. of water. Grout weight is 13.3 lb./gal. MW-72 grouted up to ground surface.
1507 Moving to MW-71.
1513 MW-71 grouted up to within 3 feet of ground surface. Seal/fill tagged at 5.5' bls. Grout mix: ½ sack of Portland Type I cement, 1 lb. Quick-Gel, 3 gal. of water. Grout weight 13.3 lb/gal.
1518 Moving to MW-58.
1522 Top of seal/fill in MW-58 tagged at 26.1' bls.

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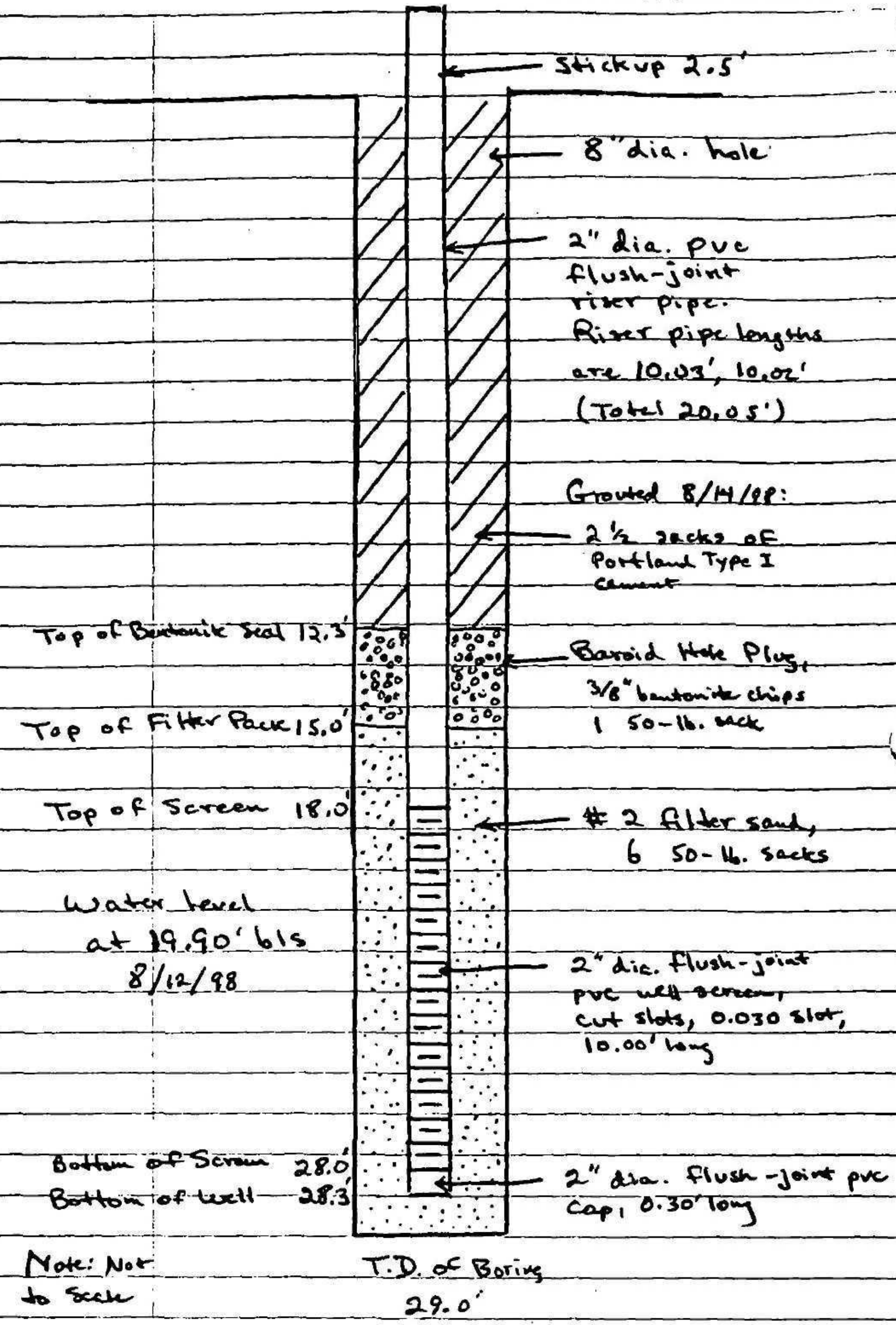
J. W. Furlow 8/11/98

August 11, 1998
1524 Mixing grout for MW-58.
1534 MW-58 grouted up to ground surface.
Grout mix: 5 sacks of Portland Type I cement, 15 lb. Quick-Gel, 35 gal. of water. Grout weight 13.7 lb./gal.
1535 Drill crew cleaning out pump and hoses.
1545 Drill crew going to clean grout out of pump. Drill crew will then move drums from well locations to drum staging area.
1730 J. Furlow off site for the day.

J.W. Furlow 8/11/98

MW-67

Date Installed:
8/12/98
Driller: Mike Coleman



August 12, 1998 Weather: Cloudy, Hot

Project: AIP Monitor Well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: Mike Coleman Helpers: Nathan Coleman

0700 All personnel on site

0715 J. Furlow conducts daily Health & Safety Tailgate briefing.

0720 Microtip IS-3000 PID calibrated.

0730 Mobilizing drill rig to MW-67 location

0735 Setting drill rig up on MW-67

0757 Begin drilling/sampling on MW-67

0917 MW-67 drilled/sampled to depth of 28' bls.

Water level at 21.15' bls.

1045 Water level in MW-67 at 19.90' bls.

Screen to be set at 18'-28'. Using 0.030 (30 slot) screen

1103 Bottom cap: 2" dia. pvc, 0.30' long.

Well screen: 2" dia, 30 slot (0.030"), cut slots, pvc 10.00' long.

Riser pipe: 2" dia, pvc, lengths: 10.03', 10.02' (total 20.05')

1118 Well screen and riser pipe decconned on site with steam cleaner.

1123 Bottom cap, well screen and riser pipe installed in well.

1125 Begin installation of filter pack (#2 filter sand). Approximately 5 gallons of water used to wash initial sand down augers.

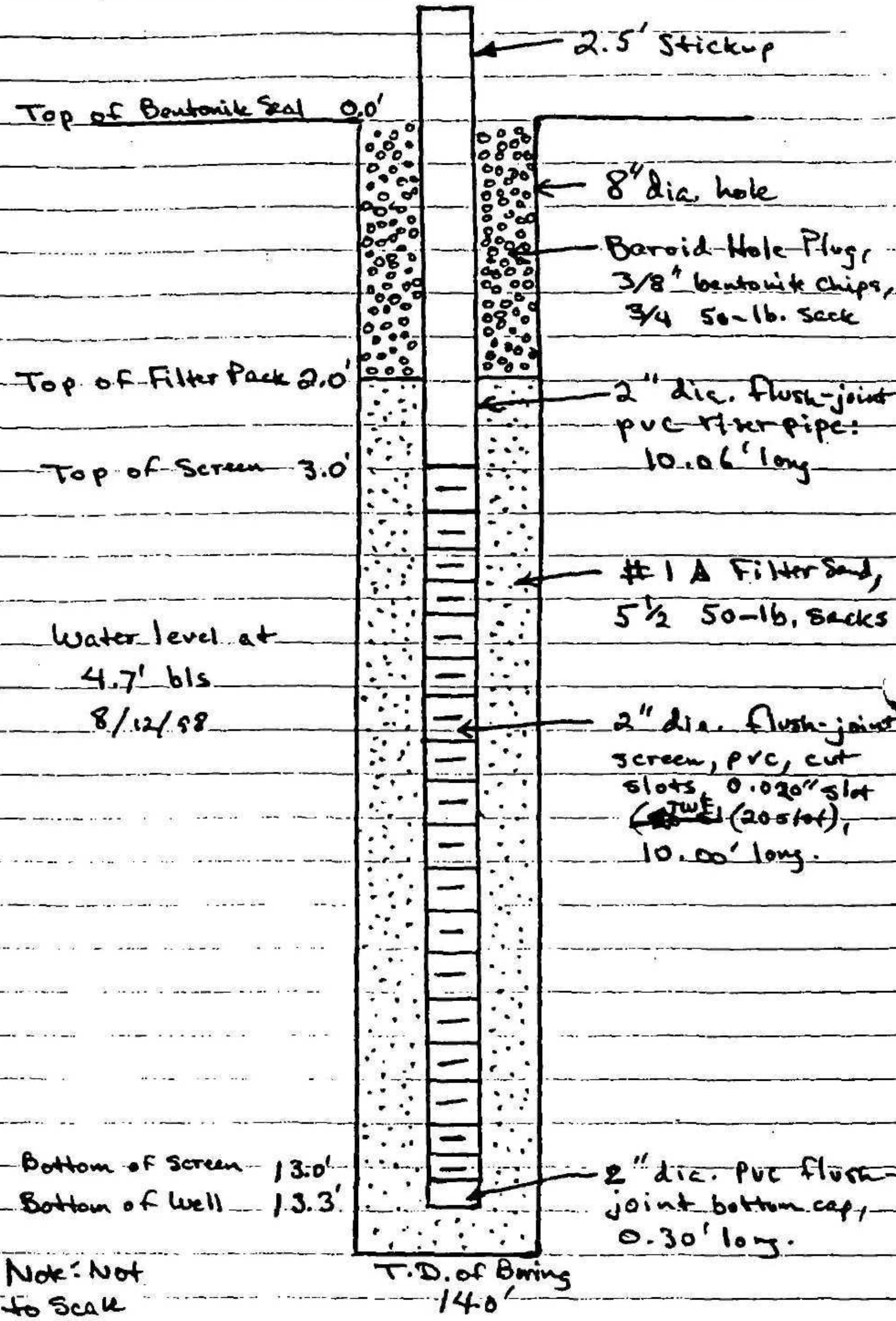
1144 ~~SC~~ JWF 8/12/98 Six 50-lb bags of # 2 filter sand installed. Top of filter sand tagged at 15.0' bls.

1148 One 50-lb. sack of Baroid Hole Plug 3/8" bentonite chips installed in MW-67.

Top of bentonite seal tagged at 12.3' bls.

14 MW-63

Date Installed
8/12/98
Driller:
Mike Coleman



Note: Not to Scale

August 12, 1998
1150 Approximately 5 gal. of water added to
well to hydrate bentonite chips.
1200 Breaking for lunch; drill crew moving rig
to decon pad.
1300 Drill crew deconning rig and drill tools.
1340 Moving to MW-63
1350 Setting up drill rig on MW-63.
1358 Begin drilling/sampling on MW-63.
1500 Water level in MW-63 measured at
4.70' bls. T. D. of boring ~~13.0~~ JRF 14.0 8/12/98 ' bls. Poor
recovery of split spoon samples.
Well screen to be set at 3'-13' bls. Using
20 slot screen and #1A filter sand.
1511 Well cap, screen and riser pipe deconned
with steam cleaner. Bottom cap: 2" dia. pvc,
flush joint, 0.30' long. Well screen: 2" dia pvc,
flush joint, 0.020" slot (20 slot), cut slots, 10.00' long.
Riser pipe: 2" dia. pvc, flush joint, 10.06' long
1515 Bottom cap, well screen, riser pipe installed
in MW-63. Screen set at 3'-13' bls. Begin
installation of filter pack (#1A filter sand).
1519 Adding approximately 5 gal. of potable
water to well in order to wash initial sand in.
1545 5½ 50-lb sacks of #1A filter sand
installed. Top of filter pack tagged at 2.0' bls.
1547 3/4 50-lb. sack of Baroid Hole Plug
installed in well. Top of bentonite seal at
ground surface.
1550 Approximately 5 gal. of water added
to hydrate bentonite chips.
1600 MW-63 installation completed. Drill crew
moving to decon pad to decon drill rig
and tools.

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J. W. Farlow 8/12/98

August 12, 1998

1735 Drill rig and tools deconned. Drill crew off site for the day

1755 Second drill crew off site for the day.

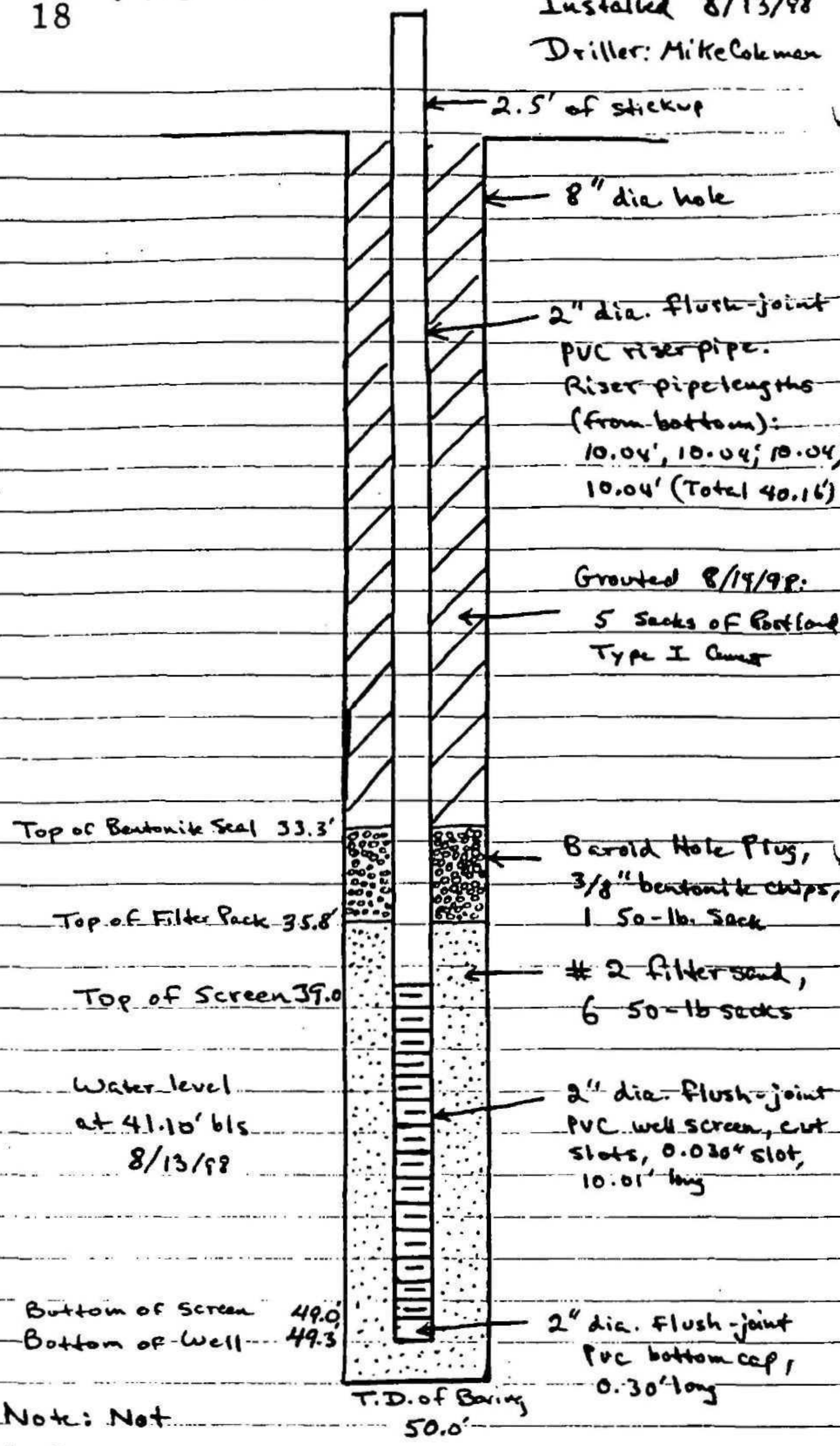
1800 J. Furlow off site for the day.

J. W. Furlow 8/12/98

18

MW-69

Installed 8/13/98
Driller: Mike Coleman



Note: Not to Scale

August 13, 1998 Weather: Clear, Hot
Project: ALP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Nathan Coleman
Technical Oversight: Jim Furlow

0700 All personnel on site
0710 J. Furlow conducts daily Health & Safety Tailgate briefing.
0730 Unable to calibrate Microtip IS-3000; instrument inoperative until problem can be found.
0735 Mobilizing drill rig to MW-69.
0750 Setting up on MW-69.
0802 Begin drilling/sampling on MW-69
1130 Boring (split spoon) depth 52'; water level at 43.5' bls.
1215 Waiting on water level tape
1310 Water level at 46.6' bls.
1400 Water level at 41.1' bls. after driller clears bottom of auger with split spoon. Screen to be set at 39'-49' bls. T.D. of Boring is 50'. T. Depth sampled with split spoon is 52'. Drill crew removing augers from boring to install wooden plug. Bottom cap, well screen, and riser pipe decon'd on site with steam cleaner.
Bottom cap: 2" dia. pvc, 0.30' long.
Well Screen: 2" dia. flush-joint pvc cut slot screen, 0.030 slot (30 slot), 10.01' long
Riser pipe: 2" dia. flush-joint pvc.
Riser pipe lengths (from bottom up): 10.04', 10.04', 10.04', 10.04' (Total 40.16')
1415 Bottom cap, well screen and riser pipe installed in well. Begin installation of filter pack in well (#2 filter sand).

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J. W. Fowler 8/13/98

August 13, 1998

1440 6 50-lb. sacks of #2 filter sand Installed in MW-69. Top of filter sand tagged at 35.8' bls.

1445 1 50-lb. sack of Baroid Hole Plug 3/8" bentonite chips installed in well. Top of bentonite seal tagged at 33.3' bls. Approximately 5 gallons of water added to well to hydrate bentonite.

1450 Drill crew removing augers from well.

1520 Demobilizing to decon pad to decon tools.

1530 J. Furlow to SAIC field office to go over records.

1740 J. Furlow off site for the day.

J. W. Furlow 8/13/98

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J. W. Furlow 8/24/98

20

August 14, 1998 Weather: Cloudy, Hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Nathan Coleman
Technical Oversight: Jim Furlow

0700 All personnel on site except for Mike Coleman and Nathan Coleman, who are picking up a backhoe from Hertz
0715 J. Furlow conducts daily Health & Safety tailgate briefing.
0720 G. Wilkinson and crew to decon pad to load up cement for grouting wells.
0740 M. Coleman and N. Coleman on site with backhoe to move drums to staging area. M. Coleman will go with G. Wilkinson to show how to mix grout.
0815 Staking locations on MW-60, MW-61 and MW-68.
1130 Monitor wells MW-43 (Topped off), MW-73, MW-70, MW-69, MW-67, MW-66 and MW-44 grouted. See Logbook #3 for details. Drill crew cleaning tools. Other drill crew moving drums to staging area.
1300 All personnel off site for the weekend.

J.W. Furlow 8/14/98

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J. W. Fowler 8/17/98

August 17, 1998 Weather: Cloudy, warm

Project: AIP Monitor Well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: Mike Coleman Helper: Mark Patterson

Technical Oversight: Jim Furlow

0700 J. Furlow and G. Naughon on site; waiting for drill crew to arrive from Aiken.

0710 Microtip IS-3000 PID calibrated.

0735 Drill crew on site.

0740 J. Furlow conducts daily Health & Safety Tailgate briefing.

0750 Drill crew unloading truckload of supplies.

0815 Moving to MW-60 location

0820 Drill rig stuck in soft spot adjacent to ~~Allied~~ Atlas JWF Van Lines building.

0825 Drill crew working to get rig out of soft spot.

0930 Crew going to Home Depot for sheets of plywood.

1015 Crew back with plywood. Attempting to get rig out of soft area.

1030 Drill rig unstuck; moving on to MW-60.

1035 Setting up on MW-60.

1050 Begin drilling/sampling on MW-60.

1153 Break for lunch.

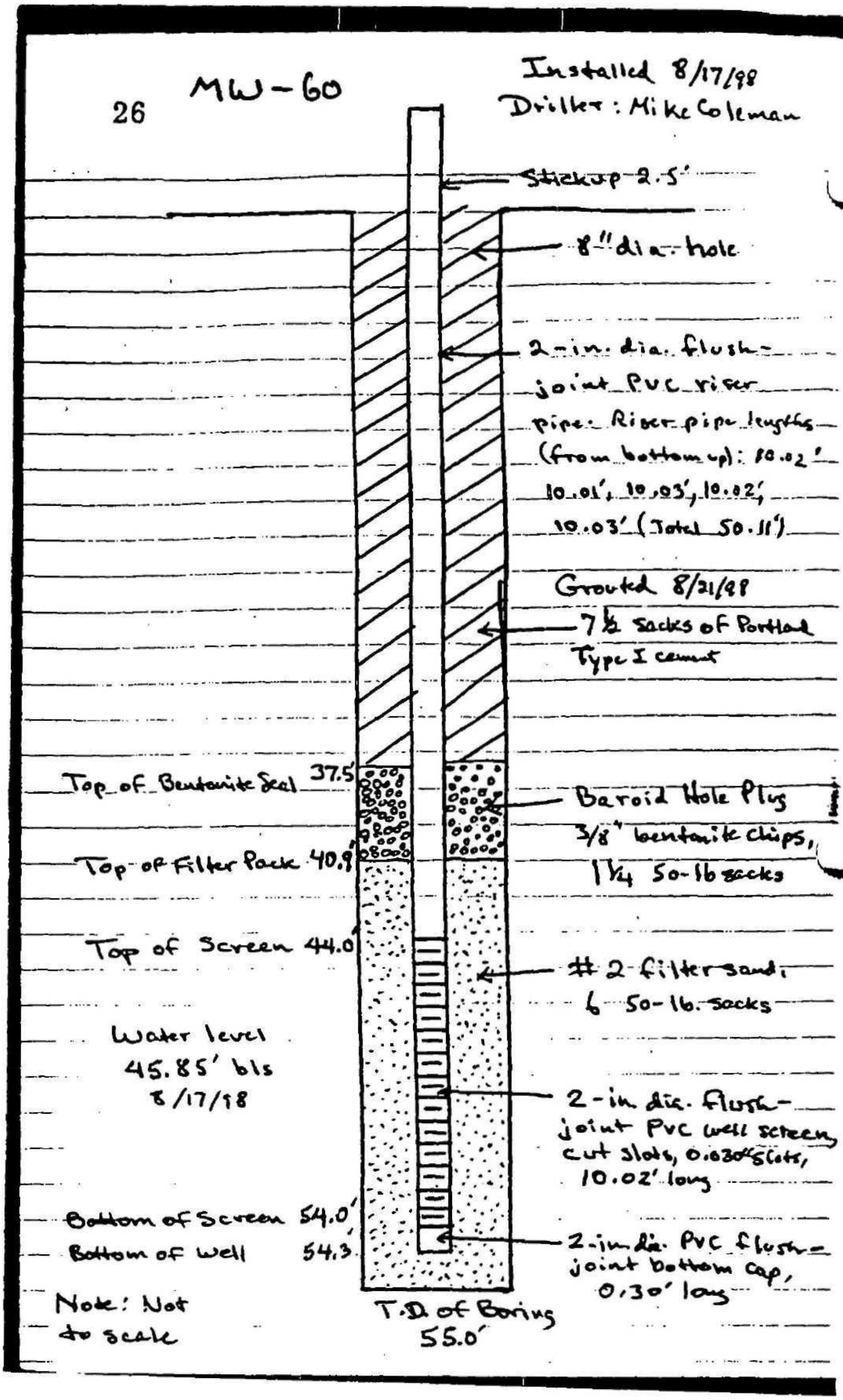
1240 Back from lunch.

1250 Resume drilling/sampling on MW-60.

1420 Boring depth 52' bgs; water level measured at 45.85' bgs.

1445 MW-60 boring drilled/sampled to depth of 54'. Well screen to be set at 44'-54' bls.

1512 Wood plug in bottom of augers. T.D. of boring 55.0' bls.



26
MW-60
Installed 8/17/98
Driller: Mike Coleman
Stickup 2.5'
8" dia. hole
2-in. dia. flush-joint PVC riser pipe. Riser pipe lengths (from bottom up): 10.02', 10.01', 10.03', 10.02', 10.03' (Total 50.11')
Grouted 8/21/98
7½ sacks of Portland Type I cement
Top of Bentonite Seal 37.5'
Baroid Hole Plug 3/8" bentonite chips, 1¼ 50-lb sacks
Top of Filter Pack 40.9'
Top of Screen 44.0'
#2 filter sand, 6 50-lb. sacks
Water level 45.85' bls 8/17/98
2-in. dia. flush-joint PVC well screen, cut slots, 0.030" slots, 10.02' long
Bottom of Screen 54.0'
Bottom of Well 54.3
2-in. dia. PVC flush-joint bottom cap, 0.30' long
Note: Not to scale
T.D. of Boring 55.0'

August 17, 1998

1515 Crew going for 0.038" slot screen (10 ft.) and #2 filter sand, riser pipe.

1530 Well construction: Bottom cap: 2" dia. PVC, 0.30' long; Well screen: 2" dia. PVC, 0.030" slots, cut slots, 10.02' long; Riser pipe: 2" dia. PVC; lengths (from bottom up): 10.02', 10.01', 10.03', 10.02', 10.03' (total 50.11'). Well screen and riser steam cleaned on site.

1532 Installing bottom cap, well screen and riser pipe in MW-60. Screen set at 44'-54'.

1535 Begin installation of #2 filter sand.

1610 6 50-lb. sacks of #2 filter sand installed. Top of filter pack tagged at 40.8' bls. Approx. 5 gal. of water used to wash sand down.

1616 1 1/4 50-lb sacks of Baroid Hole Plug 3/8" bentonite chips installed in well. Top of bentonite seal tagged at 37.5' bls. Approx. 5 gal. of water used to hydrate bentonite chips.

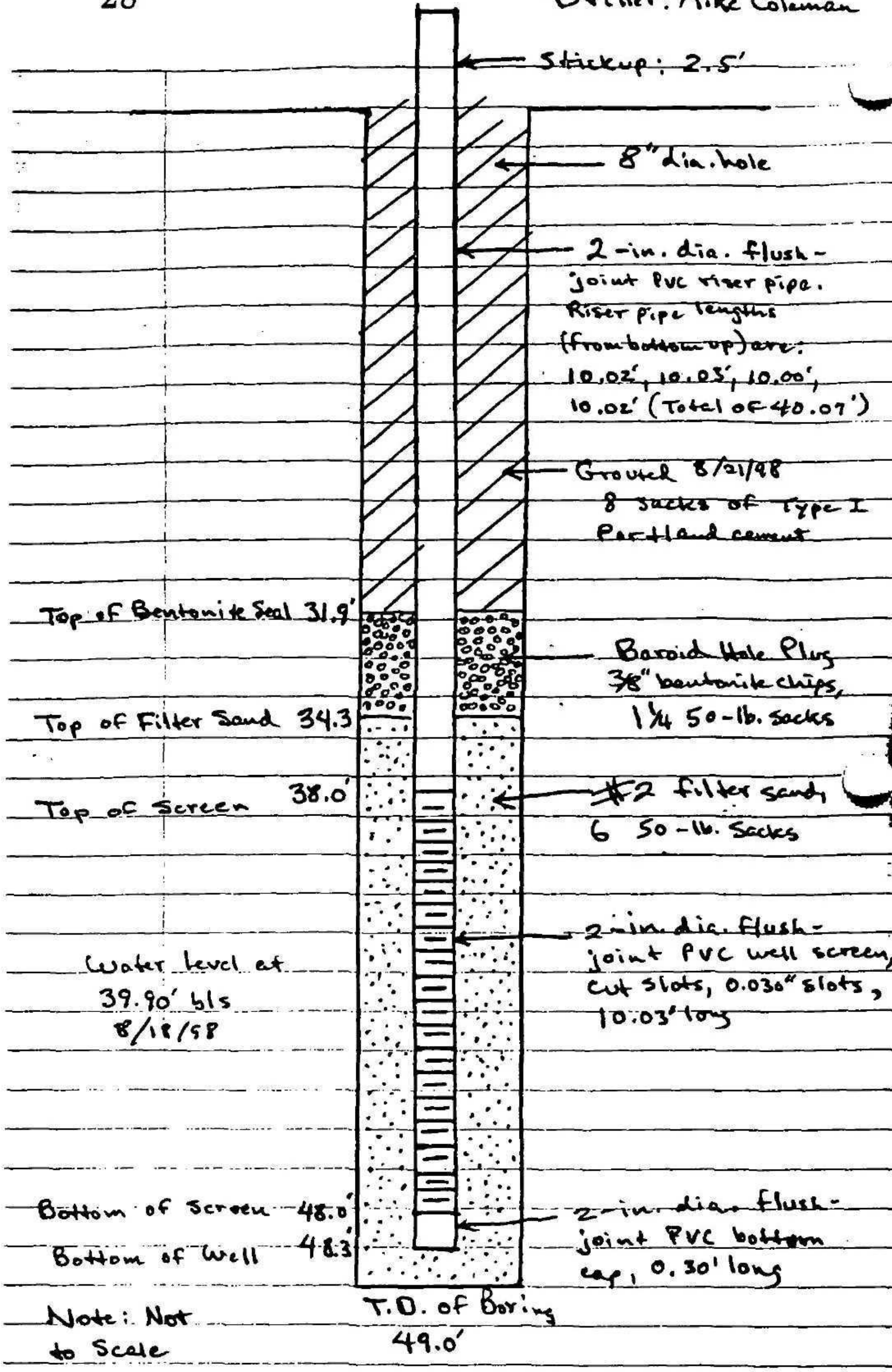
1630 Drill crew rigging down to decon drill tools and rig.

1715 All personnel off site for the day.

J. W. Farlow 8/18/98

MW-61

Installed 8/18/98
Driller: Mike Coleman



August 18, 1998 Weather: Cloudy, warm
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Mark Patterson
Technical Oversight: Jim Furlow

0705 All personnel on site
0715 J. Furlow conducts daily Health & Safety Tailgate briefing.
0725 Microtip IS-3000 PID calibrated.
0730 Drill crew deconning rig and drill tools.
0800 Gary Vaughan reports damage to monitor wells - well MW-55 is missing the expansion plug and padlock; MW-45 had part of the riser pipe unscrewed and destroyed; MW-39 had expansion cap removed and two drums of development water dumped on ground.
0815 Mike Coleman going to wells to replace expansion caps and locks.
0845 Expansion plugs and locks replaced. MW-55, MW-45 and MW-39 tagged on bottom to make sure no debris was put down wells. All wells appear to be free of debris. Mobilizing to MW-61 location.
0850 Setting up on MW-61.
0910 Begin drilling/sampling on MW-61.
1115 Water level in boring MW-61 is at 39.90' bls.
1135 MW-61 boring drilled and sampled to depth of 49.0' bls.
1150 Break for lunch
1235 Back at MW-61. Crew loading screen, riser and filter sand.
1248 Drill crew deconning well screen and riser pipe with steam cleaner.

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J. W. Furlow 8/18/78

August 18, 1998

Bottom cap: 2" PVC, length 0.30'.

Well screen: 2" PVC, 0.030" slot, cut slots, 10.03' long.

Riser pipe: 2" dia. PVC; lengths (from bottom up): 10.02', 10.03', 10.00', 10.02' (total ~~40.07'~~ 8/18/98 JWF 40.07'.

1252 Bottom cap, well screen, and riser pipe installed in MW-61. Screen set at 38.0-48.0' bls.

1254 Begin installation of #2 filter sand for filter pack.

1317 6 50-lb. sacks of #2 filter sand installed in MW-61. Top of filter sand tagged at 34.3' bls. Approximately 5 gal. of potable water used to wash sand down inside augers.

1325 1¼ 50-lb. sacks of Baroid Hole Plug 3/8" bentonite chips installed in well. Top of bentonite seal tagged at 31.9' bls. Approximately 5 gal. of potable water added to hydrate bentonite.

1345 Demobilizing to decon pad.

1350 Drill crew deconning rig and tools.

1440 Decon completed. Mobilizing drill rig to MW-68.

1445 Setting up on MW-68.

1500 Begin drilling/sampling on MW-68.

1555 Drilling/sampling on MW-68 stopped due to approaching thunder/lightning storm. Boring depth 22'.

1600 J. Furlow to MNOP landfill to scout out proposed monitor well locations.

1744 J. Furlow at SAIC field office.

1815 J. Furlow off site.

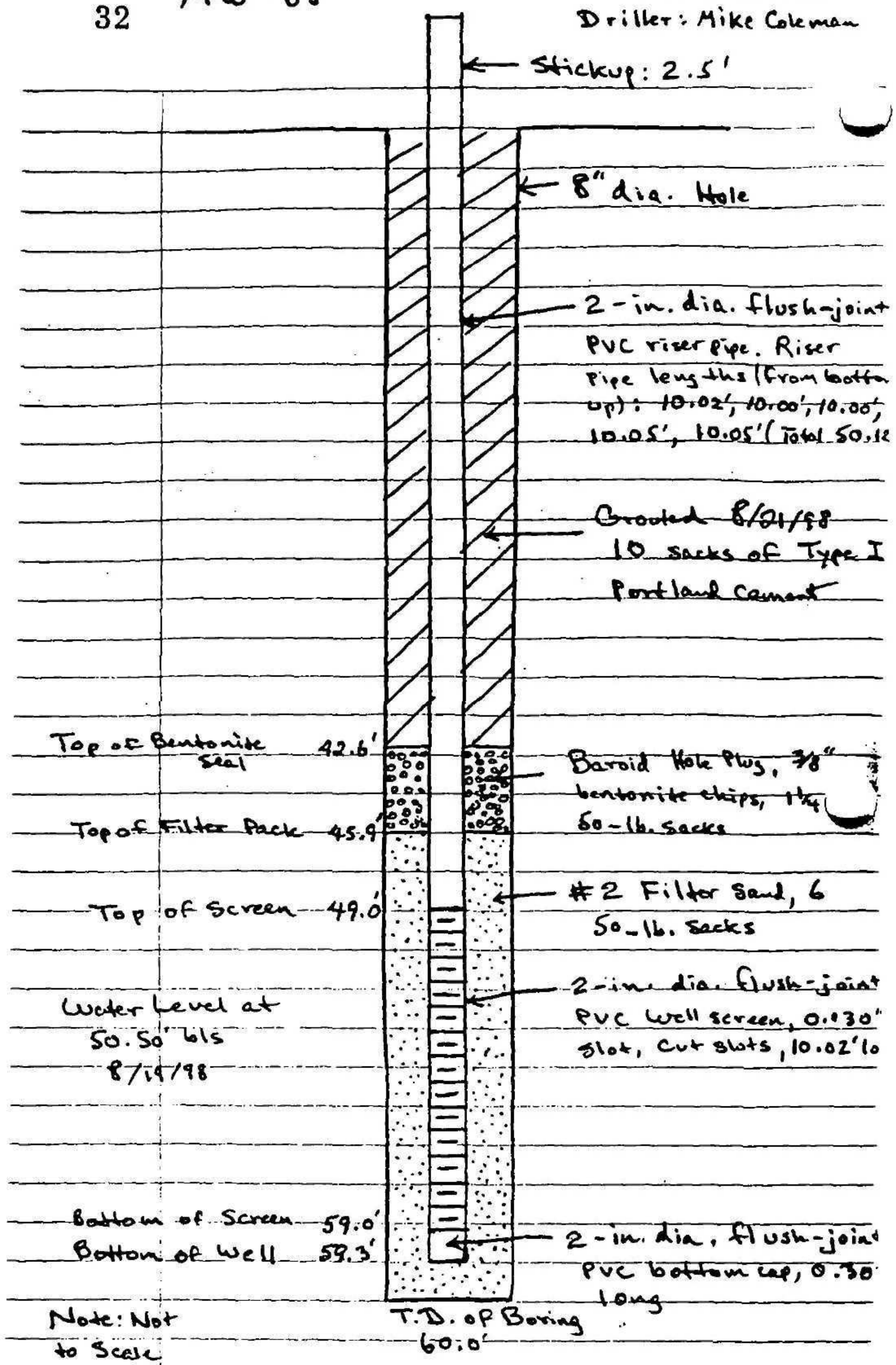
JW Furlow 8/19/98

A410

32

MW-68

Installed 8/19/98
Driller: Mike Coleman



August 19, 1998 Weather: Cloudy, hot
Project: ALP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Nathan Coleman
Technical Oversight: Jim Furlow

0703 All personnel on site
0710 J. Furlow conducts daily Health & Safety briefing
0720 Microtip IS-3000 calibrated
0745 Resume drilling/sampling on MW-68.
0915 Water level in MW-68 boring measured at 50.50' bls. Boring depth 53.0'.
1010 MW-68 drilled/sampled to depth of 60'. Well screen to be set at 49.0'-59.0'.
1047 Bottom cap, well screen, and riser pipe deconned on site with steam cleaner.
Bottom cap: 2" dia. pvc, 0.30' long
Well screen: 2" dia. PVC, cut slots, 0.030" slots, 10.02' long.
Riser Pipe: 2" dia. PVC; lengths (from bottom up): 10.02', 10.00', 10.00', 10.05', 10.05' (Total 50.12')
1052 Bottom cap, screen, riser installed in MW-68. Screen set at 49.0'-59.0' bls.
1054 Begin installation of filter pack (#2 filter sand).
1125 Top of filter pack tagged at 45.9' bls. Six 50-lb sacks of #2 filter sand installed.
1130 Top of bentonite seal tagged at 42.6' bls. 1¼ 50-lb. sacks of Baroid Hole Plug 3/8" ~~5/8~~ JWF bentonite chips installed in MW-68. Five gal. water used to hydrate bentonite.
1135 Crew demobilizing off MW-68 to decon.
1150 Break for lunch.
1240 J. Furlow and P. Albenesius go to landfill to check out monitor well locations.

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J. W. Furlow 8/19/98

August 19, 1998

1415 J. Furlow back at decon pad. Drill crew still deconning tools.

1434 Mobilizing to MW-65

1445 Setting up on MW-65

1500 Begin drilling/sampling on MW-65.

1600 Water level measured at 27.00' bls in MW-65 boring.

1615 MW-65 drilled to total depth of 36' bls. Screen to be set at 25.0'-35.0' bls.

1635 Drilling ended for the day so that drill crew can drive to Aiken, S.C. and pick up load of pallets and well supplies.

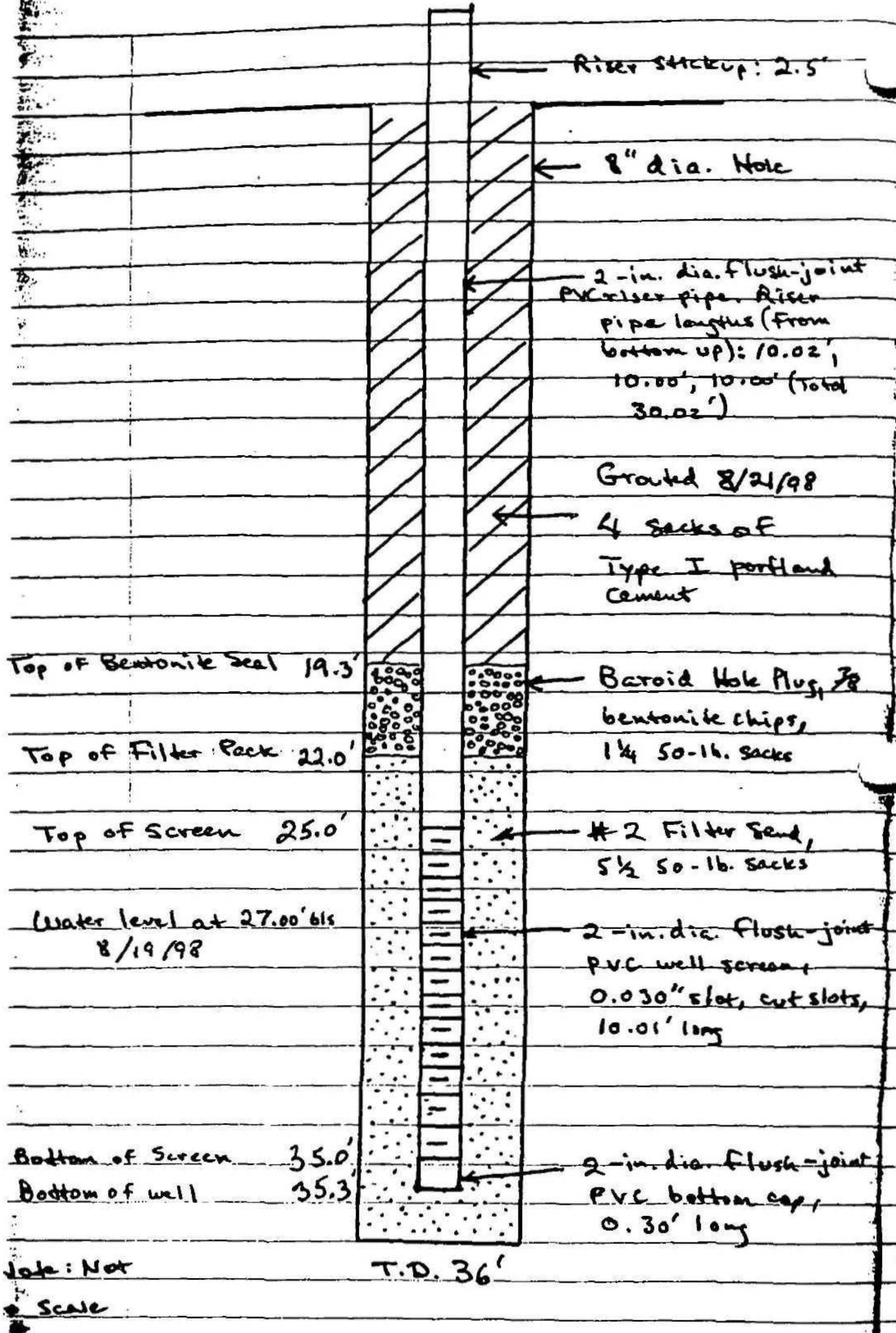
1640 J. Furlow to SAIC field office.

1800 J. Furlow off site for the day.

J. W. Furlow
8/19/98

MW-65

Installed 8/20/98
Driller: Mike Coleman

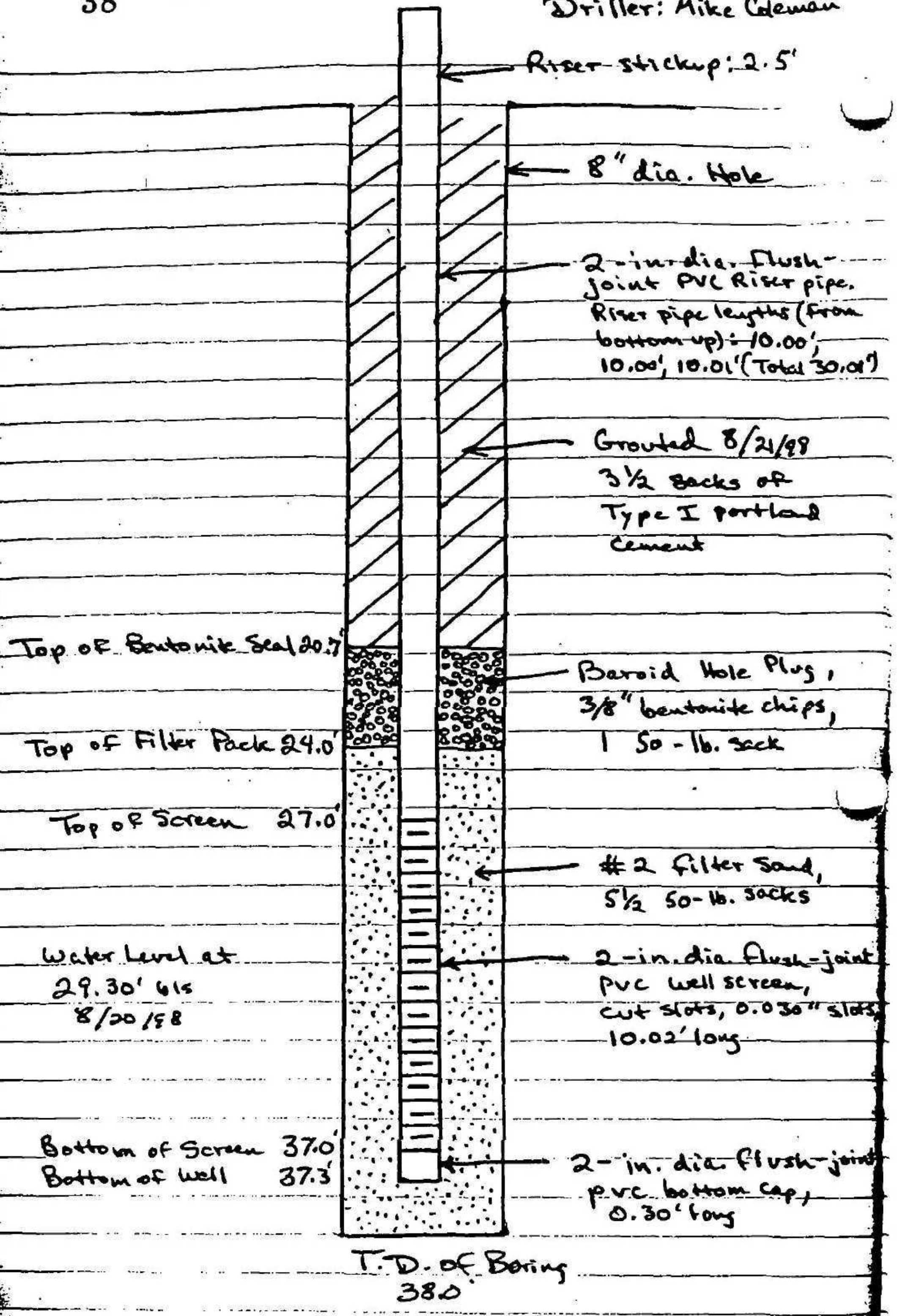


August 20, 1998 Weather: Clear, hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: Mike Coleman Helper: Nathan Coleman
Technical Oversight: Jim Furlow

0700 All personnel on site except for M. Coleman and N. Coleman, who are bringing back supplies from Aiken.
0710 J. Furlow conducts daily Health & Safety Tailgate briefing.
0720 Microtip IS - 3000 calibrated.
0725 George Wilkinson and crew off to install pads and protective housings on wells.
1205 Mike Coleman and Nathan Coleman arrive from Aiken with load of pallets. Their truck broke down just outside Augusta and had to be repaired.
1215 Crew loading up supplies to install MW-65.
1240 Crew deconning bottom cap well screen and riser pipe on site prior to installation.
Bottom cap: 2" dia. PVC, 0.30' long
Well Screen: 2" dia. PVC, cut slots, 0.030" slots, 10.01' long.
Riser pipe: 2" dia. PVC; lengths (from bottom up): 10.02', 10.00', 10.00' (Total 30.02')
1246 Bottom cap, well screen and riser pipe installed in MW-65 with screen set at 25.0' - 35.0' bls.
Begin installation of filter pack. No water added to wash filter pack into well.
1310 Top of filter pack tagged at 22.0' bls.
5 1/2 50-lb. sacks of #2 filter sand installed.
1317 Top of bentonite seal tagged at 19.3' bls.
1 1/4 50-lb. sacks of Baroid Hole Plug 3/8" bentonite chips installed. Approx. 5 gal. of water added.

38 MW-64

Installed 8/20/98
Driller: Mike Coleman



August 20, 1998

1340 Installation of MW-65 completed. Crew taking drill rig to decon rig and tools.

1440 Decon completed, rig mobilizing to MW-64.

1455 Begin drilling / sampling on MW-64

1558 Water level measured at 29.30' bls in MW-64. Screen to be set at 27.0' - 37.0' bls.

MW-64 sampled to depth of 40', reamed to diameter of 8 inches to depth of 38' bls.

1640 Crew steam cleaning bottom cap, screen and riser pipe on site prior to installation.

Bottom Cap: 2" dia. pvc, 0.30' long

Screen: 2" dia. pvc, cut slots, 0.030" slots, 10.02' long

Riser pipe: 2" dia. PVC; riser pipe lengths (from bottom up): 10.00', 10.00', 10.01' (Total 30.01')

1643 Bottom cap, screen and riser pipe installed in MW-64. Screen set at 27.0' - 37.0' bls.

Begin installation of filter pack.

1718 Top of filter pack tagged at 24.0' bls.

5½ 50-lb sacks of #2 filter sand installed.

1722 Top of bentonite seal tagged at 20.7' bls.

1 50-lb. sack of Baroid Hole Plug 3/8" bentonite chips installed. Approximately 5 gal. of potable water added to hydrate bentonite chips.

1730 Rigging down to move to decon pad.

J. Furlow to SAIC Field office.

1805 J. Furlow off site for the day.

J. W. Furlow 8/20/98

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J. W. Furlow 8/21/98

August 21, 1998 Weather: Clear, warm

Project: AIP Monitor Well Installation

Subcontractor: Alliance Environmental, Inc.

Drillers: Mike Coleman, George Wilkinson

Technical Oversight: Jim Furlow

0705 All personnel on site

0715 J. Furlow conducts daily Health & Safety Tailgate briefing. Drill crew going to load cement to grout up wells.

0730 J. Furlow and M. Coleman to MNOP landfill to clear areas for drill rig to get on monitor well locations.

0805 J. Furlow and G. Wilkinson/S. Hanson at MW-44 to top off grout. 2½ sacks of cement, 7 lb. bentonite, 18 gal. of potable water used for grout mix in MW-44. Grout rose to within 1 foot of ground surface. Grout weight 14.1 lb/gal. Moving to MW-60.

0815 Mixing grout at MW-60. Well depth to bentonite seal/fill is 28.1' bls. Grout mix: (first batch) 2½ sacks of cement, 7 lb. bentonite, 18 gal. of potable water. Grout weight 14.1 lb./gal. Second batch: 5 sacks of cement, 15 lb. Quick-Gel, 35 gal. of water. Grout weight 14.2 lb/gal. Grout rose to within 1 foot of ground surface. Moving to MW-61.

0850 Mixing grout at MW-61. Depth to bentonite seal/fill is 29.1' bls. First batch: 5 sacks of cement, 15 lb. Quick-Gel, 35 gal. of water. Grout weight 13.5 lb./gal. Second batch: 3 sacks of cement, 9 lb. Quick-Gel, 21 gal. of potable water. Grout weight 13.1 lb./gal. Moving to MW-62.

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J. W. Furlow 8/21/98

August 21, 1998

0940 MW-62 tagged at 9' bls. Previously grouted? Mixing grout: 4 sacks of cement, 12 lb. quick-Gel, 28 gal. of water. Grout weight 13.1 lb./gal. Moving to MW-73

1000 MW-73 topped off with 1 sack of cement. Drill crew going to Home Depot for more cement.

1140 Drill crew back from Home Depot with cement.

1150 Moving to MW-68. Top of bentonite/Fill tagged at 38.6' bls in MW-68. Mixing first batch of grout: 5 sacks of Portland Type I Cement, 15 lb. Quick-Gel, 35 gal. of water. Grout weight 13.8 lb/gal.

Second batch of grout: 5 sacks of cement, 15 lb. Quick-Gel, 35 gal. of water. Grout weight 14.0 lb/gal.

1250 Moving to MW-64.

1300 Mixing grout at MW-64. Top of seal/fill tagged at 19.3' bls. Grout mix: 3½ sacks of cement, 10 lb. Quick-Gel, 25 gal. of water. Grout rose to within 1 foot of ground surface. Moving to MW-65. Grout weight was 13.5 lb./gal.

1325 Mixing grout at MW-65. Top of seal/fill tagged at 16.5' bls. Grout mix: 4 sacks of cement, 12 lb. of Quick-Gel, 28 gal. of water. Grout mix was 13.8 lb./gal.

1345 Crew cleaning out lines & pump. Going to decon pad to decon tools.

J.W. Fuller
8/21/98

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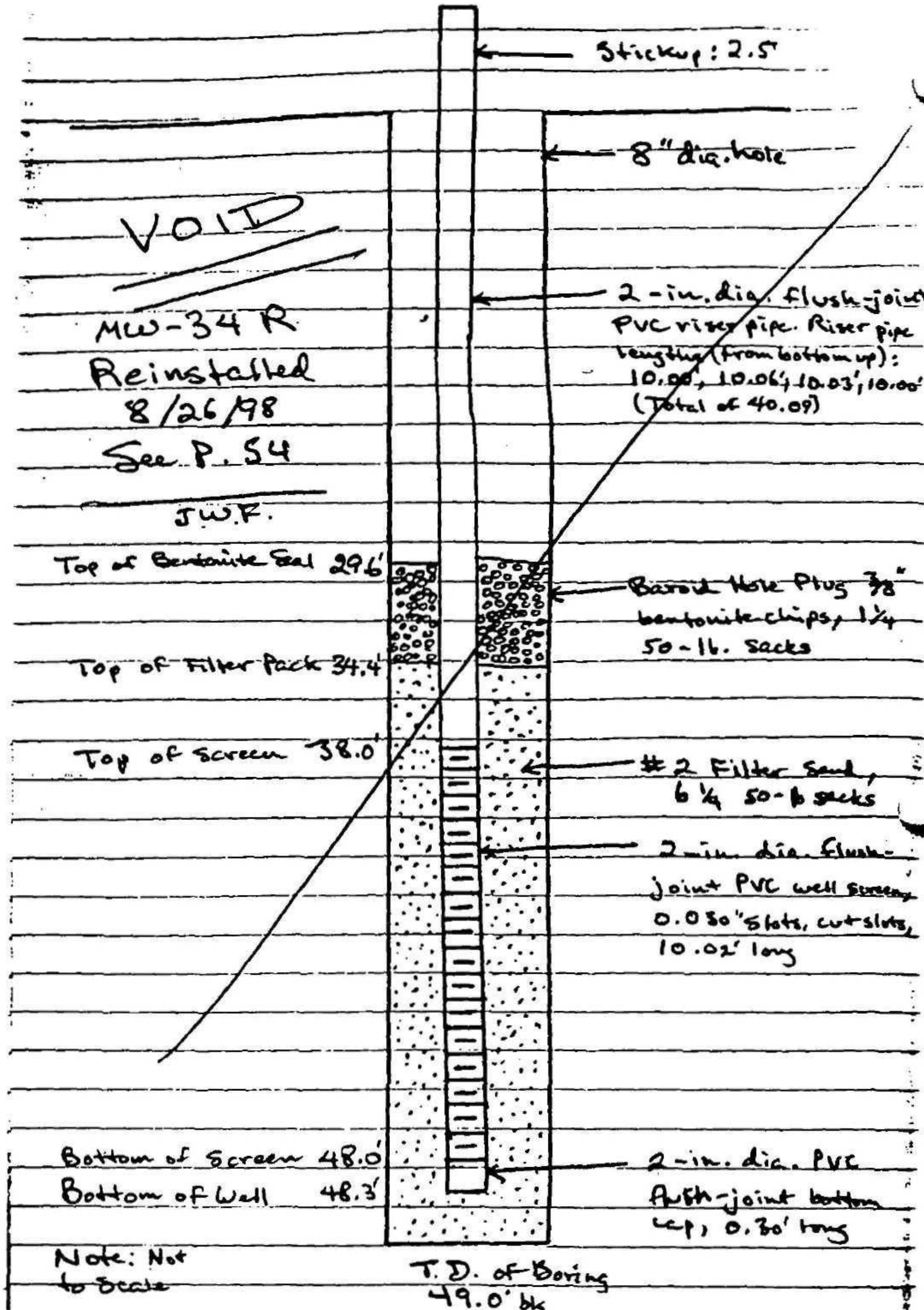
J. W. Furlow 8/24/98

August 24, 1998 Weather: Clear, warm
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson Helper: Steve Hanson
Technical Oversight: Jim Furlow

0705 All personnel on site.
0710 J. Furlow conducts daily Health & Safety Tailgate briefing
0725 Microtip IS-3000 PID calibrated.
0740 Mobilizing to MW-34 location to replace MW-34, which was set too shallow (bottom of well at 40.3' bls).
0755 MW-34: water level logged at 39.6' bls. MW-34 R (replacement) to be set with screen at 38'-48'. MW-34 R is located 20' due east of MW-34.
0826 Begin drilling on MW-34 R. Since MW-34 was sampled during drilling, MW-34R will begin sampling (continuous split spoon sampling) at a depth of 35'.
0830 Hit something solid at depth of 3'. Moving over 2 feet.
0845 Hit concrete at depth of 6'. Moving again.
0900 Hit concrete at depth of 6'. Moving again.
0910 Drilling on down. New location is approximately 15 feet east of MW-34 (original).
0950 MW-34 R drilled to depth of 35' bls. Begin continuous split spoon sampling 35'-49'.
1100 MW-34 R drilled/sampled to depth of 49' bls. Breaking for lunch.
1230 Drill crew loading up materials for well installation. Unable to obtain accurate water level in MW-34R boring due to excessive mud in hole.

46 MW-34R

Installed 8/24/98
Driller: George Wilkinson



August 24, 1998

1255 Drill crew on site with well materials

Bottom cap: 2" dia. PVC, 0.30' long

Well screen: 2" dia. PVC, cut slots, 0.030" slots, 10.02' long.

Riser pipe: 2" dia. PVC, flush joints; lengths (from bottom up): 10.00', 10.06', 10.03', 10.00' (Total 40.09')

Filter pack: #2 filter sand.

1345 Deconning bottom cap, wellscreen and riser pipe on site with steam cleaner

1400 Begin installation of MW-34R bottom cap, well screen and riser pipe.

1405 Bottom cap, screen and riser pipe installed. Well screen set at 38.0'-48.0' bls. Begin installation of filter pack.

1410 Five gallons of potable water added to well to wash down initial sand.

1450 Top of filter pack tagged at 34.4' bls; 6 1/4 50-lb. sacks of #2 filter sand installed.

1500 Top of bentonite seal tagged at 29.6' bls; 1 1/4 50-lb. sacks of Baroid Hole Plug 3/8" bentonite chips installed. Approximately 5 gal. of potable water added to hydrate bentonite.

1520 Drill crew rigging down to move to decon pad.

1600 Moving to decon pad to decon rig and drill tools.

1830 J. Furlow off site for the day.

J. W. Furlow 8/24/98

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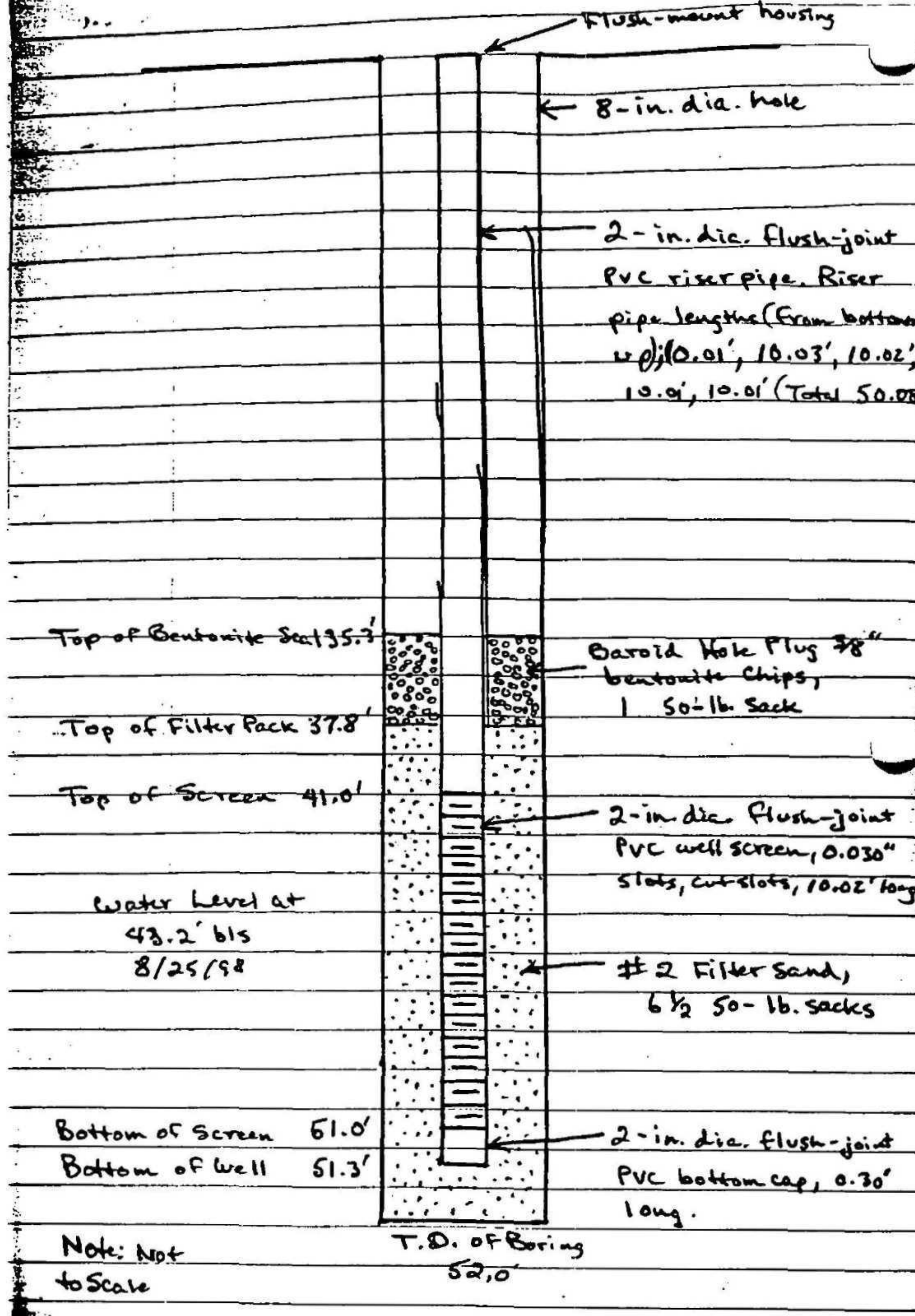
J. W. Durlaw 8/25/98

August 25, 1998 Weather: Clear, Hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson Helper: Nathan Coleman
Technical Oversight: Jim Furlow

0718 All personnel on site. Microtip IS-3000 PID calibrated.
0725 J. Furlow conducts daily Health & Safety Tailgate briefing.
0730 Drill crew to decon area to get drill rig
0745 Drill crew measuring cables to be replaced.
0810 Setting up on MW-33 location approx. 75 feet due south of location shown on Figure 4A.6 of Work Plan.
0834 Begin drilling/sampling on MW-33
1220 Break for lunch. MW-33 drilled/sampled to depth of 52'.
1300 Back from lunch. Drill crew going to load up well construction materials.
1320 Water level in MW-33 boring measured at 43.3' bls.
1340 Water level in MW-33 boring measured at 43.2' bls. Screen to be set at 41.0'-51.0' bls.
Drill crew deconning bottom cap, screen and riser pipe on site with steam cleaner.
Bottom cap: 2" dia. PVC, 0.30' long
Well screen: 2" dia. PVC, cut slots, 0.030" slots, 10.02' long.
Riser Pipe: 2" dia. PVC; lengths (from bottom up): 10.01', 10.03', 10.02', 10.01', 10.01' (Total: 50.08')
1350 Drill crew tripping augers out of hole to install wooden plug in auger bit.

MW-33

Driller: George Wilkinson
Installed 8/25/98



August 25, 1998

1415 Wood plug in bit, tripping augers back in hole.

1447 Bottom cap, well screen and riser pipe set in MW-33. Well screen at 41.0'-51.0' bls. Begin installation of filter pack (#2 filter sand).

1520 Top of filter pack tagged at 37.8' bls. 6½ 50-lb. sacks of #2 filter sand installed. Approx. 5 gal. of water used to wash sand down initially.

1526 Top of bentonite seal tagged at 35.3' bls. 1 50-lb. sack of Baroid Hole Plug 3/8" bentonite chips installed. Approximately 5 gal. of potable water added to boring to hydrate bentonite.

1530 Crew rigging down to move to decon pad.

1600 Moving to decon pad to decon rig and tools. Crew will replace cables on rig winches after deconning.

1720 J. Furlow off site for the day.

J. W. Furlow 8/25/98

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J. W. Furlow 2/26/98

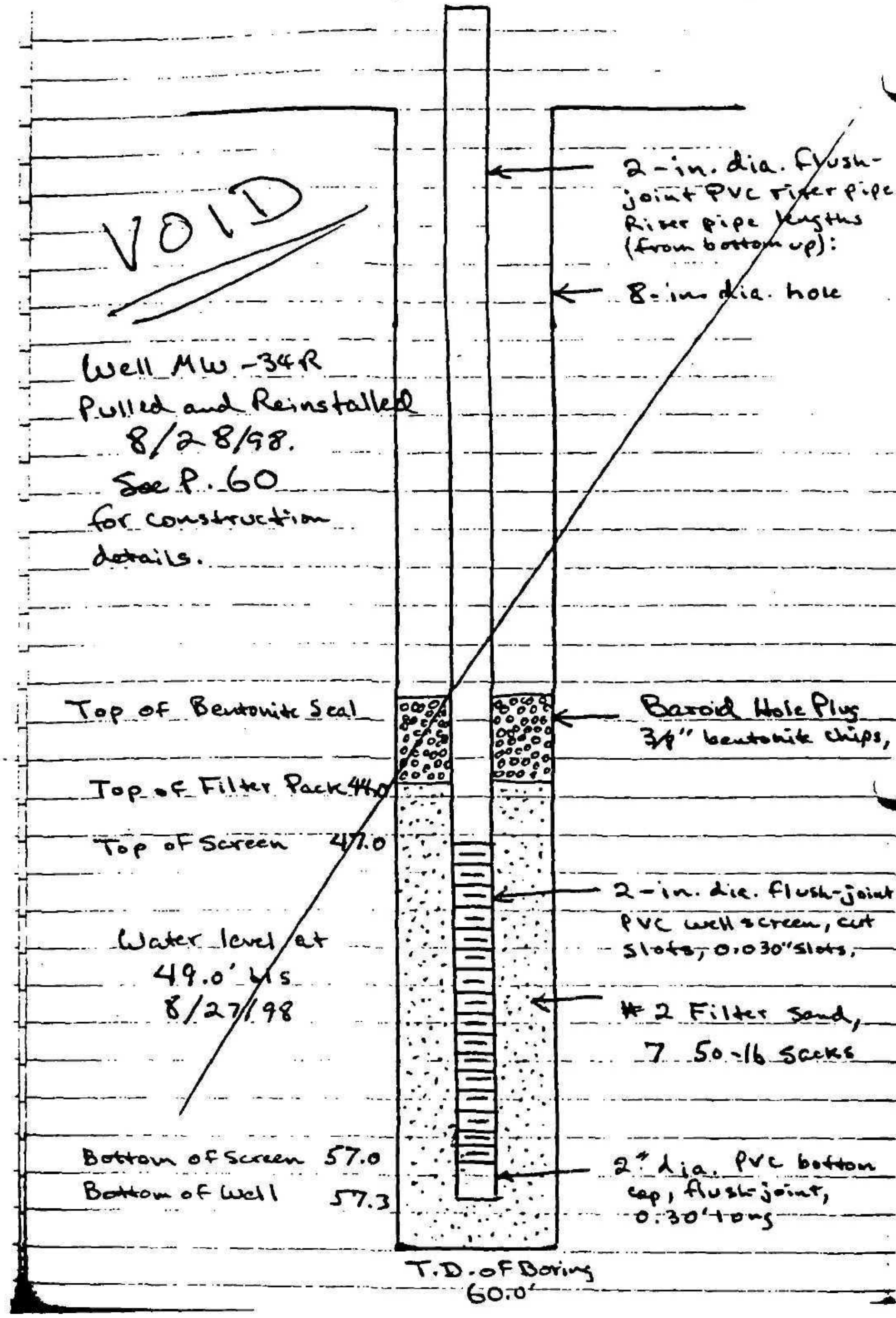
August 26, 1998 Weather: Clear, Hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Technical Oversight

0700 All personnel on site
0705 Gary Vaughn reports that he ran water level tape into MW-34R and there was no water in the well. We will pull the riser pipe and screen from the hole, drill deeper, and reinstall the well in the same hole.
0710 J. Furlow conducts daily Health + Safety Tailgate briefing.
0715 Microtip IS-3000 PID calibrated.
0720 Drill crew working to replace 1/2" cable on main winch on drill rig.
0800 Drill crew having substantial difficulty getting old cable off rig drum.
1050 Old cable off drum and off rig. Begin putting new cable on rig.
1155 Cable replaced on rig drum. Mobilizing rig to MW-34R.
1205 Breaking for lunch
1230 Back from lunch. Begin setting up to pull screen and riser from MW-34R.
1255 Well screen and riser pipe pulled from MW-34R. Tripping in with augers to bottom.
1310 Begin drilling/sampling at depth of 50' bls.
1600 MW-34R drilled/sampled to depth of 60' bls. Water level measured at 51.15' bls. Screen to be set at 49.0'-59.0'.
1610 Tripping out to put wood plug in bottom of augers.

54 MW-34 R

Re-installed 8/26/98

Driller: George Wilkinson



August 26, 1998

1650 Tripping augers back in to install well.

1725 Bottom cap, well screen, riser pipe installed in hole.

Bottom cap: 2" dia. PVC, 0.30' long

Well screen: 2" dia. PVC, cut slots, 0.030" slots, 10.02' long

Riser pipe: 2" dia. pvc; pipe lengths (from bottom up): 10.00', 10.05', 10.02', 10.00', 10.02' (Total 50.09').

1732 Begin installation of filter pack (#2 filter sand)

1800 Filter sand bridged over during installation, driller unable to break bridge loose. Will come back tomorrow, pull the well screen and riser out, and reinstall.

1805 J. Furlow to SAIC field office.

1830 J. Furlow off site for the day.

J.W. Furlow
8/26/98

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J.W. Farlow 8/27/98

August 27, 1998 Weather: Clear, Hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson Helper: Julius Twiggs
Technical Oversight: Jim Furlow

0700 All personnel on site
0710 J. Furlow conducts daily Health & Safety Tailgate briefing.
0725 Water level in MW-34 R measured at 49.0' bls
0735 Drill crew on site at MW-34 R.
0747 Begin pulling augers and screen/riser pipe out of hole.
0830 Augers out of hole; putting wood plug in bit.
0840 Going back in with augers
0920 Bottom cap, well screen and riser pipe steam cleaned on site.
0925 Bottom cap, well screen and riser pipe installed in well. Screen set at 47.0'-57.0' bls. Begin installation of filter pack (#2 filter sand)
1110 Filter pack bridged over again, driller unable to wash bridge out. Pulling augers and well assembly out of hole to reinstall.
1155 All augers and well assembly out of hole.
1300 Tripping augers back in hole to reinstall well.
1405 Augers back on bottom. Crew steam cleaning well screen and riser pipe prior to reinstalling.
1445 Bottom cap, well screen and riser pipe decond and reinstalled in MW-34 R, screen set at 47.0'-57.0
1420 Begin installation of filter pack (#2 Filter Sand)
1533 ~~7~~ 50-16 Sacks of #2 filter sand installed. Top of filter sand tagged at 44.0' bls.

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J.W. Farlow 8/27/98

August 27, 1998

1600 Bentonite chips bridged over after approximately ½ sack was installed; unable to remove bridge. Pulled augers out of hole.

1700 With augers out of hole, top of fill was tagged at 32' bls. Top of ½ sack of bentonite was at approximately 43.5' bls.

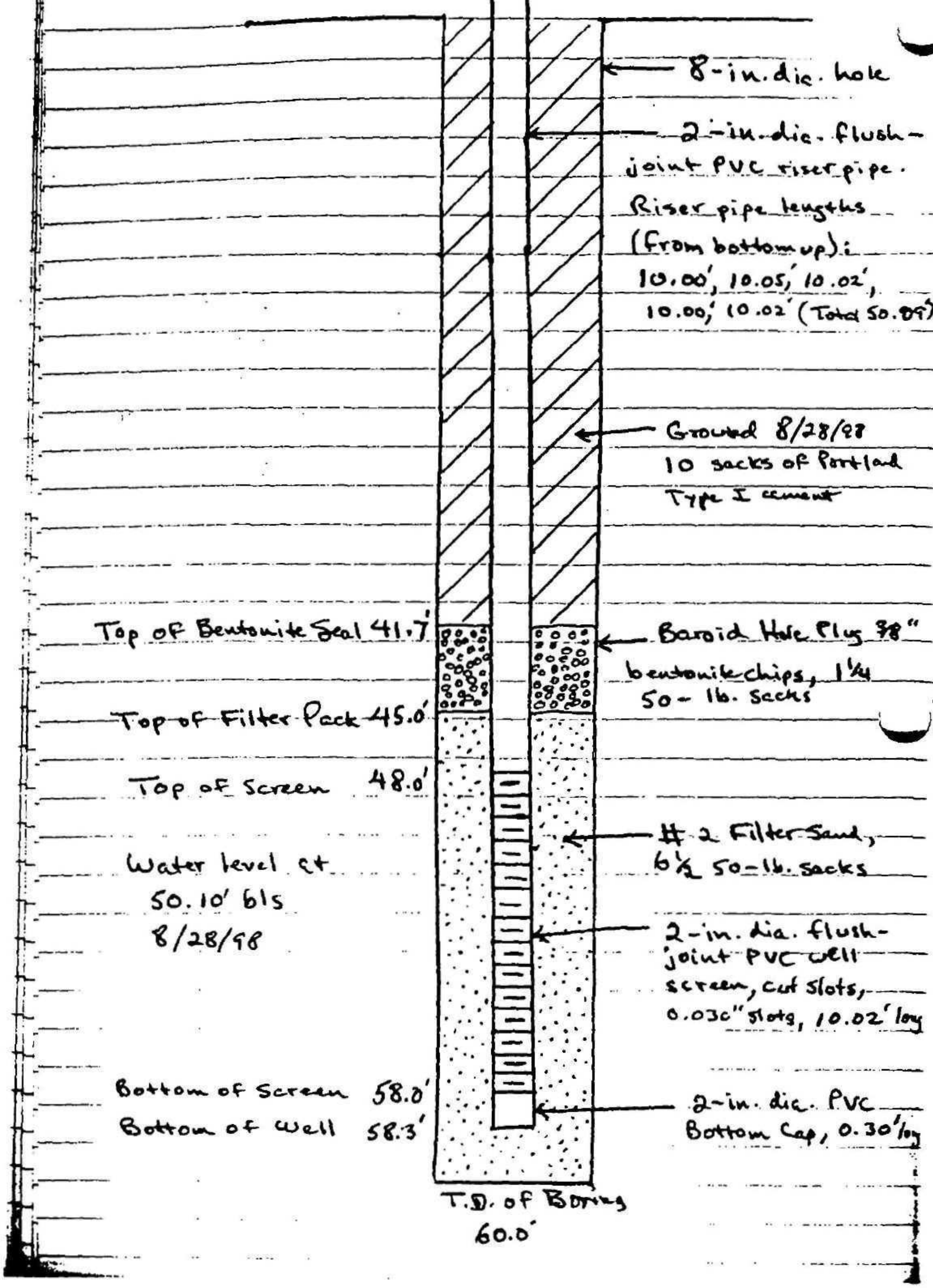
1710 Stopping work for the day.

1735 J. Furlow off site for the day.

J. W. Furlow
8/27/98

60 MW-34R

Installed 8/28/98
Driller: George Wilkinson



August 28, 1998 Weather: Clear, hot
Project: AIP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson Helpers: Julius Twiss, Dennis Creech
Technical Oversight: Jim Furlow

0700 All personnel on site
0710 J. Furlow conducts daily Health & Safety Tailgate meeting.
0720 Water level in MW-34 R tagged at 50.10' bls.
0725 Pulling riser pipe, well screen and bottom cap out of MW-34 R
0745 Steam cleaning bottom cap, well screen and riser pipe prior to re-installation in MW-34R.
0843 MW-34 R boring re-augered to depth of 59' bls.
0848 Bottom cap, well screen, riser pipe re-installed in MW-34 R. Screen to be set at 48.0'-58.0', based on 8/28 water level of 50.10' bls.
0908 Begin installation of filter pack (#2 filter sand)
0948 6 1/2 50-lb. sacks of #2 filter sand installed. Top of filter pack tagged at 44.6' bls.
0951 Recheck top of filter pack. Tagged at 45.0' bls. Begin installation of bentonite seal.
1008 Top of bentonite seal tagged at 41.7' bls. 1 1/4 50-lb. sacks of Baroid Hole Plug 3/8" bentonite chips installed.
1010 Approximately 5 gal. of potable water added to hydrate bentonite.
1030 Drill crew tripping augers out of hole.
1120 Augers out of hole. Top of fill tagged at 31.9' bls. Drill crew mixing grout.
1125 First batch of grout mixed: 5 sacks of Type I Portland Cement, 15 lb. Quick-Gel,

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J. W. Furlow 8/28/88

August 28, 1998

35 gal. potable water. Grout weight 13.0 lb/gal.
Pumping grout into well.
1130 First batch pumped. Mixing second batch of grout: 5 sacks of cement, 15 lb. Quick-Gel, 35 gal. of water
1152 Grout weight 14.1 lb./gal. Pumping second batch of grout into MW-34R. Grout rose to within 1 foot of ground surface.
1205 Drill crew going to decon drill rig and tools
1300 Drill crew off site for weekend.
1345 J. Furlow off site for weekend

J.W. Furlow
8/28/98

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J. W. Furlow 8/31/98

August 31, 1998 Weather: Cloudy, Hot

Project: AIP Monitor Well Installation

Subcontractor: Alliance Environmental, Inc.

Driller: George Wilkinson Helpers: Nathan Coleman, Steve Henson

Technical Oversight: Jim Furlow

0700 All personnel on site except for helpers from Aiken office, who were going to leave Aiken at 7 AM (according to Blake Cabit of Alliance Env.).

0715 J. Furlow conducts daily Health & Safety Tailgate briefing.

0720 Drill crew to decon pad to get drill rig.

0730 Drill tools not adequately deconned on previous Friday; crew deconning tools.

0815 Drill tools deconned. Mobilizing drill rig to MW-33 to grout well.

0820 Mixing first batch of grout.

0825 Top of seal/Fill tagged at 33.4' bls.

0836 First batch of grout mixed: 5 sacks of Portland Type I cement, 15 lb. Quick-Gel, 35 gal. of water. Grout weight is 13.6 lb./gal. Begin pumping first batch of grout in MW-33.

0839 First batch of grout pumped. Mixing second batch.

0848 Second batch of grout mixed: 2 sacks of Portland Type I cement, 6 lb. Quick-Gel, 14 gal. of water. Grout weight 14.0 lb./gal. Begin pumping grout.

0850 Grout up to within 10 feet of ground surface.

0855 Mixing third batch of grout: 2 sacks of cement 6 lb. Quick-Gel, 14 gal. of water. Grout weight 13.2 lb/gal.

0900 Begin pumping third batch of grout. Grout rose to within 1 foot of ground surface.

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J. W. Furlow 8/31/98

August 31, 1998
0906 Cleaning out pump and hose lines.
0945 Drill crew preparing to install pads on remaining wells in AIP.
1000 J. Furlow replacing locks on protective housings on west side of AIP.
1045 J. Furlow to SAIC office to review records.
1600 J. Furlow out of office to check on well depths.
1645 Mud/sand found in bottom of wells previously developed. Talked to P. Albenesius, who agreed that wells will have to be bailed to remove sediment in bottom.
1830 J. Furlow off site for the day.

J. W. Furlow
8/31/98

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J. W. Furlow 9/1/98

Sept. 1, 1998 Weather: Cloudy, Hot
Project: ALP Monitor Well Installation
Subcontractor: Alliance Environmental, Inc.
Driller: George Wilkinson
Technical Oversight: Jim Furlow

0700 All personnel on site
0710 J. Furlow conducts daily Health & Safety Tailgate briefing.
0715 Discussed well sediment problem with Gary Vaughan, instructed Gary to bail sediment from bottom of wells.
0725 J. Furlow to MW-34 R to attempt to remove tag line weight lost in well by G. Vaughan on 8/31/98.
0730 Water level in MW-34 R measured at 52.36' below top of casing. Casing stickup 2.1' above ground.
0735 Working to retrieve tag line weight from MW-34 R.
1145 Break for lunch.
1220 Resume efforts to retrieve tag line weight.
1335 Tag line weight retrieved from MW-34R by taping treble hook to end of 1/2" dia PVC pipe, running pipe in well, and hooking tag line wrappings
1350 Going to other wells to see how sediment removal is proceeding.
1430 Gary Vaughan says bailing is not removing sediment in bottom of wells. Using PVC pipe to stir and break up ~~compacted~~ JWF 9/1/98 compacted sediments in bottom of MW-64.
1500 Gary Vaughan still unable to recover sediments in bottom of MW-64. He will go to other wells and try to clean them out using same method.

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J.W. Furlow 9/1/98

Sept. 1, 1998

1600 Efforts to remove sediment from wells stopped for the day. J. Reader of Alliance Environmental is bringing a B-K pump tomorrow.

1720 Pads installed on all wells in AIP area. Drill crew off site for the day.

1725 J. Furlow off site for the day.

J.W. Furlow 9/1/98

March 16, 1999
Project: AIP/MNOP Landfill
Personnel: Jim Furlow, Bruce Kristiansen

0955 J. Furlow, B. Kristiansen at SAIC field office.
1010 J.F. and B.K. to MNOP landfill to check for 55-gallon drums of purge water.
1040 No 55-gallon drums of purge water left at landfill. All have been moved to drum storage area.
1115 J.F. going to Home Depot for rope and fence posts.
1230 J.F. and B.K. to ~~landfill~~ 3/16/99 JWF AIP to look for ISL 113 and ISL 114.
1315 Unable to find original locations of ISL 113 and ISL 114; stakes put out approximately at original sample locations. Found original field map showing previously sampled locations of ISL 113 and ISL 114 to be as marked on Figure 4A.10 of Work Plan.
1330 J.F. and B.K. to Landfill to look for LSL-29.
1400 LSL-29 located; still staked with original stake. J.F. and B.K. going to west side of AIP to check locations of ISL-115, ISL-116, ISL-117.
1430 ISL-115, 116, 117 locations determined to be different from surveyed locations. Will restake tomorrow for resurvey next week.
1500 J.F. and B.K. at drum storage area.
1530 Perimeter posts and rope put up around drum storage area.
1550 J.F. and B.K. off site for the day.

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J. W. Fowler 3/17/69

March 17, 1999

Project: MNOP Landfill/AIP

Personnel: Jim Furlow, Bruce Kristiansen

0725 J. Furlow and B. Kristiansen at SAIC field office.

0740 J.F. and B.K. restaking locations for ISL-115, ISL-116, and ISL-117.

0755 J.F. and B.K. at drum storage area to renew drum labels and check drum inventory.

0845 All drum labels remarked, recently added drums inventoried.

1000 J.F. to Fed. Exp. to pick up cooler with sample containers.

1020 J.F. and B.K at ISL-127 (formerly ISL-113) to sample soil.

1030 Soil samples ISL-127 collected (1 4-oz VOA jar, 1 8-oz SVOC jar).

1050 Soil samples ISL-128 collected at former location of ISL-114 (1 4oz VOA jar, 1 8-oz SVOC jar). J.F. to store for ice.

1105 Packing soil samples ISL-127 and ISL-128 for shipment to GEL.

1145 Soil samples packed and delivered to Fed. Ex. for shipment to GEL.

1230 J.F. and B.K. off site.

J W Furlow
3/17/99

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J. W. Fowler 5/24/99

May 24, 1999

Project: Disposal of drums of uncontaminated soils and water.

Project Team: Jim Furlow, Bruce Kristiansen

Alliance Crew: Richard Mooney, Jim Hall, Sr., Brian Gillespie

0940 J. Furlow and B. Kristiansen on site at MNOP

0950 J. Furlow to Allied Industrial Park office to talk to Tom Yocum. T. Yocum says to dump soils and water in old borrow pit at south end of AIP (just south of E-W power line).

1015 J. F. to Office Depot for field supplies. Waiting for Alliance crew to arrive.

1245 Alliance crew on site with front-end loader and steam cleaner.

1300 J. Furlow conducts Health & Safety brifing for all personnel.

1315 Johnnie Render of Alliance Environmental on site.

1320 J. F. and B. K. identifying drums to be dumped with color-coded stickers. Alliance crew going back to rental shop to get pallet forks for front-end loader.

1345 Loading 55-gallon drums onto trailer, using front-end loader with pallet forks.

1415 Alliance taking front-end loader back to rental shop to swap for forklift.

1440 Alliance back with forklift.

1450 Loading drums on pallets onto trailer.

Drums loaded and dumped:

5/24/99

Row 1 (Soils)	Row 2 (Soils)
ISL-123	ISL-119
ISL-123	ISL-119
ISL-121	ISL-118
ISL-121	CH-10
ISL-120	CH-10
ISL-120	CH-10
CH-10	CH-5
CH-10	CH-5
CH-7	CH-6
CH-7	CH-6
CH-6	
CH-6	
CH-6	
CH-3	

J.W. Farlow 5/24/99

May 24, 1999 (Continued)

1610 Total of 24 drums (see list on P. 154) of soil cuttings loaded onto trailer, taken to borrow pit and dumped into borrow pit. No drums steam cleaned yet.

1640 All personnel off site for the day.

J. W. [illegible]
5/24/99

May 25, 1999

Drums Loaded and Dumped:

	Row 1 (Soil Cuttings)			Row 2 (Soil Cuttings)	
	CH-3	CH-5		CH-6	MW-60
	CH-3	CH-5		CH-6	MW-61
	CH-3	CH-6		CH-6	MW-61
load 1,	CH-2	CH-6	load 1,	CH-6	MW-61
Row 1	CH-2	CH-2	Row 2	CH-2	ISL-109
	CH-2	CH-2		CH-2	ISL-110
	CH-2	CH-5		CH-2	ISL-112
	CH-5	CH-5		CH-2	MW-42
	CH-5	CH-1		CH-2	MW-~~42~~ 56 JWF
	CH-5	CH-1		CH-2	MW-42
	CH-5	CH-4		CH-5	ISL-111
	CH-5	CH-4		CH-5	MW-47
load 2,	CH-5	MW-47	load 2	CH-5	Decon Fluid
Row 1	CH-5	MW-47		CH-5	Decon Fluid
	CH-1	MW-56		CH-5	Decon Fluid
	CH-1	MW-38		CH-5	MW-56
	CH-1	MW-38		CH-1	MW-30
	CH-1	MW-38		CH-1	MW-30
	CH-1	~~MW-42~~		CH-1	MW-30
	CH-1	~~MW-56~~		CH-1	MW-37
	CH-4	~~MW-42~~ JWF		CH-4	MW-35
	CH-4			CH-4	MW-35
	CH-4			CH-4	MW-37
load 3,	CH-4		load 3,	CH-4	
Row 1	CH-4		Row 2	CH-4	
	CH-4			CH-4	
	CH-4			CH-4	
	CH-4			CH-4	
	CH-4				
	CH-4				
	CH-4				
	CH-7				

Load 1 JMQ

Load 1 JMQ

Load 2 JMQ

Load 5, Rows 1 & 2 JMQ

Load 5, Row 1

May 25, 1999
Project: IDW Disposal at Allied Industrial Park
SAIC Oversight: Jim Furlow, Bruce Kristiansen
Alliance Environmental Personnel: Richard Moomy, Jim Hall, Sr., Brian Gillespie.

0700 All personnel at SAIC Field Office. Moving equipment to drum storage area.
0715 Forklift and truck/trailer at drum storage area. Begin loading drums.
0725 First load, 16 drums from Rows 1 + 2 (See Page 156 for list of drums).
0815 Second load, 24 drums from Rows 1 + 2.
0945 Crew working to repair broken U-bolt on trailer axle.
1040 U-bolt replaced, drums from second load dumped.
1055 Third load, 24 drums from Rows 1 + 2.
1140 Third load dumped. Total of 88 drums dumped, approximately 218 drums left.
1145 Break for lunch.
1240 Resume loading drums
1310 Fourth load, 21 drums from Rows 1 + 2 + 3 loaded on trailer & truck.
1355 Fourth load of drums dumped. Begin loading remainder of Row 1 (MW-42, MW-56, MW-42 soil cuttings).
1445 Fifth load of drums loaded from Rows 1, 2 and 3 (16 drums). Rows 1 and 2 now gone.
ISL-126, ISL-117, ISL-116, ISL-115, MW-39, MW-45, MW-45, MW-36, MW-56, MW-56, MW-29 drums (soil) (11 drums) set aside on pallets

May 25, 1999 (Continued)

Row 3, Soil Cuttings - Drums loaded and dumped:

	MW-35		MW-72
	MW-31	Load 7	MW-66
	MW-40		MW-58
	MW-43		MW-71
Load 6, Row 3	MW-31		MW-58
	MW-55		MW-67
	MW-55	5/25	MW-73
	MW-40		
	MW-43		
	MW-43		
	MW-43		
	MW-29		
	MW-34		
	MW-29		
	MW-34		
	MW-29		
	MW-28		
Row 3	MW-32		
	MW-32		
	MW-32		
Load 7, Row 4	MW-51		
	MW-51		
	~~MW-51~~ JWF		
	MW-51		
	MW-51		
	MW-63		
	MW-69		
	MW-65		
	MW-62		
	MW-62		
	MW-72		

May 25, 1999 (Continued)
for disposal by other means.
1520 Sixth load of drums loaded on truck and trailer (Row 3, 17 drums). Total of 142 drums loaded and dumped (including Load 6).
1545 Load 6 dumped. Begin loading Load 7.
1605 Seventh load of drums loaded on truck and trailer (Row 3, 3 drums, Row 4, ~~15~~ 14 JWF drums). Total of ~~18~~ 17 JWF drums on 7th load (all soil cuttings).
1617 Forklift came back for 3 more drums (MW-58, MW-67, MW-73). Total of ~~163~~ 162 JWF drums loaded and taken to borrow pit for dumping.
1650 All drums dumped into borrow pit. Moving equipment to SAIC Field office.
1700 All personnel off site for the day.

J. W. Furlow
5/25/99

May 26, 1999

Row 4 (Soil Cuttings) Drums Loaded and Dumped:

MW-49	MW-64
MW-48	MW-65
MW-48	MW-70
MW-57	MW-65
MW-57	MW-70
MW-49	MW-34R
MW-57	MW-34R
MW-49	MW-34R
MW-42	MW-34R
MW-48	MW-70
MW-38	MW-68
Decon Sludge	Decon Sludge
Decon Sludge	MW-60
Decon Sludge	MW-68
Decon Sludge	Decon Sludge
MW-33	Decon Sludge
MW-33	Decon Sludge
Decon Fluid	Decon Sludge
Decon Fluid	MW-39 Dev. water
MW-4B	MW-52 Dev. water
MW-4B	Decon Sludge
MW-2B	Decon Sludge
Decon Fluid	Decon Sludge
Decon Fluid	MW-60
MW-73	MW-68
MW-69	MW-61 Dev. water
MW-66	MW-55 Dev. water
MW-69	MW-37 Dev. water
MW-69	MW-67
MW-33	Decon Sludge
MW-12	Decon Sludge
MW-64	Decon Sludge 226 Total

Load 8, Row 4

Load 9

Load 10

Load

Load

Load 12

May 26, 1999

Project: IDW Disposal/Drum Segregation at Allied Industrial Park

SAIC Oversight: Jim Furlow, Bruce Kristiansen

Alliance Environmental Personnel: Jim Hall, Sr.; Brian Gillespie

0710 All personnel on site at SAIC field office

0720 Begin loading drums on trailer.

0730 Load 8 (15 drums) on trailer. Hauling to borrow pit to dump.

0805 Load 8 dumped. Loading drums for Load 9, moving other drums to be disposed of by Safety-Kleen.

0835 Load 9 on trailer (12 drums). Hauling to borrow pit to dump.

0900 Load 9 dumped, loading drums on trailer for Load 10

0914 Load 10 on trailer, hauling to borrow pit. (14 drums).

1000 Load 10 dumped.

1044 Load 11 loaded and hauled to borrow pit (16 drums)

1110 Load 11 dumped. Loading Load 12 on trailer (7 drums)

1130 Load 12 hauled to borrow pit. Total of 226 drums taken to borrow pit to be dumped.

1225 Load 12 dumped. Pallets loaded on trailer to take to landfill. Break for lunch.

1320 Back from lunch. Alliance separating hazardous waste drums according to disposal

Total of 61 drums

W* = water = 50 drums
S* = Soil cuttings = 11 drums

May 26, 1999

Inventory of Contaminated, Non-Hazardous Materials
Staged at AIP for disposal by Safety-Kleen:

MW-57 W*	MW-67 W
MW-42 W	MW-67 W
MW-48 W	MW-40 W
MW-31 W	MW-60 W
MW-32 W	MW-28 W
MW-49 W	MW-73 W
MW-35 W	MW-32 W
MW-58 W	MW-57 W
MW-51 W	MW-48 W
MW-44 W	MW-72 W
MW-43 W	MW-29 W
MW-63 W	MW-73 W
MW-68 W	MW-35 W
MW-71 W	MW-33 W
MW-4B W	MW-34R W
MW-4B W	MW-34R W
MW-4B W	MW-33 W
MW-38 W	MW-42 W
MW-69 W	MW-13 W
MW-70 W	MW-48 W
MW-69 W	MW-44 W
MW-30 W	MW-28 W
MW-72 W	MW-57,-61,-68, PZ3, PZ4 W
MW-62 W	MW-72,-73,-44,-60,-62,-49
MW-44 S*	MW-30,-29,-28, PZ2 W
MW-44 S	MW-34R,-35,-31,-37 W
MW-36 S	MW-39 S
MW-29 W	MW-45 S
ISL-116 S	MW-45 S
ISL-126 S	ISL-115 S
ISL-117 S	Total of 61 drums

May 26, 1999 (Continued)

method to be used: To be incinerated:

MW-15 Development water

MW-67, -71, -40, -47, -45, -39 Purge water

MW-13, -4, -11, -2, -2B, -4B Purge water

MW-15 Purge water

MW-45 Development water

MW-47 Development water

MW-13 Soil Cuttings

MW-15 Soil Cuttings

Total of 8 drums (6 water, 2 soil)

Hazardous Waste drums going to Pre-Treatment:

MW-56 Development Water

MW-56 Development Water

MW-64 Development Water

MW-64 Development Water

MW-66, -64, -65, -PZ5, -63, -12 ~~Development~~ Purge JWF Water

MW-56, -55, -70, -69, PZ6 ~~Development~~ Purge JWF Water

MW-65 Development Water

MW-66 Development Water

MW-56 Development water

Total of 9 drums (all water)

1405 Beginning to rain hard. J. F. and Alliance crew taking trailer load of pallets to Swift Creek landfill.

1445 Dumping pallets at landfill.

1530 Back at drum staging area at AIP. Alliance crew filling up tank on pressure washer.

1555 Alliance loading empty drums to clean.

1710 Two trailer loads of empty drums cleaned out.

1720 All personnel off site for the day. JW Furlow 5/26/99

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J. W. Farlow 5/27/99

May 27, 1999

Project: IDW Disposal / Drum Segregation at A.I.P.

SAIC Oversight: Jim Furlow / Bruce Kristiansen

Alliance Environmental Personnel: Jim Hall, D. Gillesp

0715 J. Furlow and B. Kristiansen at SAIC field office.

0730 Alliance crew on site. Filling pressure washer water tank.

0745 Begin cleaning out empty drums.

0930 Trailer loaded with 41 empty cleaned drums. Going to Macon Iron on Lower Poplar Rd. to dispose of drums.

1035 Back at AIP for another load of drums.

1045 Crew begins washing drums out.

1150 Taking second load of drums to Macon Iron for disposal (42 drums).

1325 Crew back from Macon Iron. Begin cleaning another load of empty drums.

1430 Taking third load of empty drums to Macon Iron for disposal (42 drums).

1540 Crew back from Macon Iron. Begin cleaning another load of drums.

1655 Fourth load of empty drums cleaned and loaded on trailer (42 drums). Too late to take to Macon Iron today.

1700 All personnel off site for the day.

J.W. Furlow 5/27/98

A467

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J. W. [illegible] 5/28/99

May 28, 1999

Project: IDW Disposal/Drum Segregation at A.I.P.

SAIC Oversight: Jim Furlow, Bruce Kristiansen

Alliance Environmental Personnel: Jim Hall, Brian Gillespie

0725 J. Furlow and Alliance crew leave motel with trailer load of drums to be disposed of at Macon Iron.

0755 Unloading drums at Macon Iron (42 drums).

0830 Back at Allied Industrial Park.

0845 Met with Tom Yocum, got key to Building 2 so that we can store empty cleaned drums for next phase of investigation. Crew unloading drums into storage area of Building 2.

0945 All drums stored inside Building 2 (approximately 58 drums). Drums to be carried off by Safety-Kleen are on pallets, labeled, roped off, and posted with Keep Out signs. At Phil Albenesius' request, J.F. and B.K. checked condition of existing wells. MW-30 has been primed, but not painted. MW-2B and MW-4B need signs. MW-2B and MW-4B were painted without primer, steel is rusting through. MW-1S and existing well by railroad tracks on which housing was replaced also show rust leaching through paint.

1030 J.F. and B.K. off site.

J. W. Furlow
5/28/99

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J. W. Furlow 6/18/99

June 18, 1999

Project: IDW Disposal / Drum Removal

0931 J. Furlow at AIP Police Substation

0946 Alan Dean and Wayne Lybrand of Safety-Kleen arrive at AIP Police substation to pick up drums

0955 At drum storage site, inspecting drums and determining treatment process for each group of drums.

1005 Safety-Kleen personnel tightening up drum bungs and putting their labels on drums. All drums accounted for on shipping manifest according to categories of treatment.

1038 Begin loading drums on truck.

1108 Eight drums to be incinerated (6 water, 2 soil) and 9 drums going to Pre-treatment (all water) loaded on truck. Begin loading 61 contaminated, non-hazardous (50 water, 11 soil) drums on truck.

1120 Alan Dean says there are 10-12 drums filled with water which have bulging bottoms. He calls his office, supervisor says they can't take drums with bulging bottoms since they might fall over in transport and leak. All drums with bulging bottoms are contaminated non-hazardous materials.

1320 All non-hazardous drums loaded on truck except for 8 with bulging bottoms. These are: MW-48 W, MW-40 W, MW-31 W, MW-48 W, MW-48 W, MW 48 W, and two with labels covered with Non-Regulated Waste Stickers applied by Safety-Kleen. Unable to identify drums without peeling stickers off.

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J. W. Farlow 6/18/99

June 18, 1999 (continued)

1330 Hazardous waste drum MW-13 (soil) with bulging bottom placed in overpack drum and loaded onto truck. All hazardous waste drums on site have now been loaded onto truck.

1340 Safety-Kleen truck departing site. J. Furlow and A. Dean going to AIP office to make copies of manifest.

1400 Copies of manifest made and faxed to Safety-Kleen office.

1405 A. Dean off site. J. Furlow calls P. Albenesius to let him know 8 drums of non-hazardous material are left on site.

1415 J. Furlow off site to Atlanta.

J. W. Furlow
6/18/99

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J. W. Farlow 7/22/99

July 22, 1999
Project: IDW Disposal / Drum Removal

0940 J. Furlow on site at MNOP drum storage area. Hammering on bottoms of drums to knock bulging bottoms back in place.
1000 Scott Stroud on site. Continuing to beat drum bottoms back in place.
1100 Four drums returned to serviceable condition by hammering bottoms back in. Four other drums are not useable because bottoms could not be hammered in, severely bent bottom, leak in drum.
1110 J.F. and S.S. to Tom Yocum's office to get key to building where empty drums were stored.
1130 Back at drum storage area with empty drums for transfer of liquids.
1135 Begin transfer of liquid nonhazardous waste by pumping from one drum to another.
1205 Liquid from one drum transferred to a good drum. Break for lunch.
1300 Resume transferring contaminated non-hazardous waste to good drums.
1445 All contaminated non-hazardous waste from four damaged drums transferred to three good drums. Total of 7 drums waiting to be picked up by Safety-Kleen.
1500 J. Furlow and S. Stroud off drum storage site for the day. All 7 drums stored in roped-off area posted with No Trespassing signs.

J. W. Furlow 7/22/99

RLP KS 07/23/09

07/23/99

0830 Scott Stroot @ drum staging area awaiting Safety Kleen personell for IDW pickup.

1000 Safety Kleen still not arrived. Go to MBCIA/AIP office to call PWA.

1015 PWA informs SS that he will call Safety Kleen. SS goes to AIP entrance to look for Safety Kleen.

1020 Safety Kleen waiting @ AIP entrance. They have been there only 5-10 minutes.

1030 Safety Kleen begins loading seven drums onto truck.

1100 Seven drums of nonhazardous liquid (Manifest # GAD 00302676) loaded, labeled and secured.

1115 Safety Kleen departs. SS removes rope and posts from staging area. No drums remaining @ staging area

1130 SS departs AIP to Augusta.

07/23/99

A477

RECORD

[illegible]

22/25 –

18[illegible]

pp. 1-67

8/27/98

0600 COMPLETE PAPERWORK, LOAD SAMPLING EQUIPMENT.

0700 SAFETY MEETING - B. KRISTIANSEN & M. GILCHRIST

0740 MOBE TO MW-30

STATIC WL - 37.17' SET PUMP @ 40.0'

0810 BEGIN PURGING

					GAL	
0815	pH	COND	TURB	DO	VOL.	TEMP
0820	5.01	132	664	8.13	1	17.9
0827	5.11	69	999+	7.30	2.5	19.6
0835	5.04	68	999+	7.41	4.0	19.6
0842	5.06	66	267	7.38	5.5	20.2
0849	5.12	67	174	7.56	7.0	20.7
0856	5.20	66	117	7.59	8.5	20.7
0902	5.14	67	50	7.52	10.0	20.8
0911	5.07	67	18	7.55	11.5	20.9
0920	5.11	66	3	7.54	13.0	21.1
0930	5.09	66	4	7.63	15.0	21.1

0940 PULL PUMP - TAKE BAILED SAMPLE 2 VOA, 1 PPM

0950 TO IDW STORAGE AREA

1010 MOBE TO PZ-2

STATIC WL - 42.43', TAG - 47.33', PUMP @ 45.0'

1030 START PUMP - VERY MUDDY / SETTLES QUICKLY

—	pH	COND	TURB	DO	VOL.	TEMP
1040	4.75	77	999	8.16	1	25.5
1056	4.77	77	999	8.68	2	26.9
1110	4.79	72	999	9.17	3	26.5

SHUT DOWN PUMP + PULL, ALLOW TO RECOVER - CONSIDER PUMP DRY

1130 WL @ 42.46' - TAKE BAILED SAMPLE 2 - VOA'S ONLY

1150 RETURN TO OFFICE - DECON PUMPS

B Kuehne 10/27/98

10/27/98

1310 MOBE TO MW-29
STATIC LEVEL - 59.68', SET PUMP @ 64'
1335 BEGIN PURGING

—	PH	COND	TURB	DO	GALS	TEMP
1342	6.21	89	891	10.53	1	23.8
1350	5.94	66	320	9.18	2.5	24.4
1356	5.49	57	75	8.35	4.0	24.8
1404	5.49	56	0	7.89	5.5	24.9
1409	5.39	55	0	8.04	7.0	24.8
1415	5.39	55	0	8.02	8.5	24.3

1425 PULL PUMP - TAKE BAILER SAMPLE
2-VOA's, 1-PPM
1440 TO IDW STORAGE AREA
1455 MOBE TO MW-28
STATIC LEVEL 12.14 PERI. TUBING @ 16'
1510 BEGIN PURGING - PERISTALTIC

—	PH	COND	TURB	DO	GALS	TEMP
1515	5.00	79	117	8.27	0.50	23.4
1520	4.94	72	83	8.25	1.5	23.2
1527	4.95	77	66	8.60	2.5	22.1
1535	4.91	77	0	8.26	3.5	22.9
1542	4.84	77	0	8.19	4.5	22.8
1550	4.90	77	0	7.99	5.5	23.0

SLOW PUMP RATE 5 MINS.
1600 COLLECT 2-VOA + 1-PPM
1615 TO IDW STORAGE + OFFICE TO DECON,
1750 OFFSITE

[signature] 10/27/98

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10/28/98

0700 SAFETY MEETING, LOAD UP
0740 MOBE TO MW-33
STATIC LEVEL-43.01' PUMP@ 46'
0800 BEGIN PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0805	5.25	43	210	7.99	0.5	17.9
0810	4.95	51	504	7.61	1.5	20.3
0818	4.89	50	80	7.54	2.5	22.4
0826	4.89	51	11	8.06	3.5	22.6
0833	4.90	51	3	7.89	4.5	22.9
0841	4.85	52	0	7.56	5.5	23.4
0850	4.87	52	0	7.44	7.0	23.4

0900 PULL PUMP - TAKE BAILED
SAMPLE 2 VOA'S 1-PPM
0915 TO IDW STORAGE
0920 MOBE TO MW-32
STATIC LEVEL - 48.20' PUMP - 52'
0925 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0927	4.69	65	72	9.08	0.5	21.0
0934	4.75	66	244	8.82	2.0	22.7
0940	4.67	65	55	8.63	3.0	22.9
0947	4.66	66	32	8.41	4.0	23.3
0953	4.66	67	12	8.30	5.0	23.3
0959	4.65	67	5	8.42	6.0	23.2
1005	4.64	66	0	8.39	7.0	23.2
1011	4.61	65	0	8.42	8.0	22.9

1020 PULL PUMP - TAKE BAILED SAMPLE
+ DUPLICATE 2 VOA'S, 1-PPM, 15VOA (EA)
1050 TO IDW STORAGE
1145 PAPERWORK, DECON, SHIPPING
1500 DEPART SITE

10/28/98

A483

B Kentham 11/7/98

11/2/98

0700 SAFETY MEETING, LOAD UP
0740 MOBE TO MW-34R
0750 STATIC LEVEL-52.90' PUMP @ 56'
0800 BEGIN PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0805	4.79	64	599	8.92	0.5	19.4
0811	4.85	57	60	8.02	1.5	21.5
0816	4.89	57	0	7.90	2.5	21.9
0821	4.86	57	-24/0	7.86	3.5	22.0
0826	4.84	55	0	7.90	4.5	22.2

0830 PULL PUMP - TAKE BAILED SAMPLE
2-VOA'S 1-PPM
0850 TO IDW STORAGE
0900 MOBE TO MW-35
STATIC LEVEL 46.73' SET PUMP @ 50'
0915 BEGIN PURGING - TRIP BREAKER (PVC?)

—	pH	COND	TURB	DO	GALS.	TEMP
0925	4.59	101	28	8.00	1.5	22.0
0930	4.55	79	7	8.28	3.0	21.3
0935	4.50	72	41	8.42	4.5	21.1
0940	4.49	70	0	8.53	6.0	21.1
0945	4.50	70	0	8.65	7.5	21.2
0950	4.49	71	0	8.66	9.0	21.1

0955 PULL PUMP - TAKE BAILED SAMPLE
1000 2-VOA'S 1-PPM 1-SVOC
1015 TO IDW STORAGE
1025 TO DECON PUMPS
1105 MOBE TO MW-31
1110 STATIC LEVEL - 27.61' PUMP - 32'/START

—	pH	COND	TURB	DO	GALS	TEMP
1115	5.46	35	479	7.68	0.5	25.7
1120	4.79	72	533	8.93	1.5	22.7

[signature] 11/2/98

11/2/98

—	pH	COND	TURB	DO	GALS.	TEMP
1125	4.72	71	798	9.07	2.5	22.6
1130	4.74	69	145	9.26	3.5	22.1
1140	4.74	70	0	9.40	5.5	22.3
1145	4.74	70	0	9.29	6.5	22.5
1150	4.75	69	0	9.35	7.5	22.6

PULL PUMP

1200 TAKE BAILER SAMPLE - 2 - VOA'S 1 PPM

1210 TO IDW STORAGE & OFFICE (DI)

1215 MOBE TO MW-37

STATIC LEVEL - 32.19 PUMP. 35'

1225 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1230	5.69	44	78	8.45	0.5	27.2
1235	5.40	36	242	9.73	2.0	22.7
1240	5.30	36	34	9.66	3.0	22.7
1245	5.29	37	13	9.76	4.0	22.8
1250	5.34	37	0	9.78	5.0	22.6
1255	5.29	38	0	9.66	6.0	23.0
1300	5.32	38	0	9.70	7.0	23.0

PULL PUMP

1310 TAKE BAILER SAMPLE - 2 VOA'S

1320 TO IDW STORAGE

1330 TO OFFICE - DECON & LOAD PERISTALTIC

1420 MOBE TO PZ-1, CUT GRASS

STATIC LEVEL - 8.83 TUBING - 11'

1430 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1435	4.91	68	166	10.84	1.0	22.4
1440	4.84	72	33	10.86	2.0	21.4
1445	4.65	90	32	11.24	3.0	20.9
1450	4.62	92	29	10.94	4.0	20.8

11/2/98

11/2/98

–	pH	COND	TURB	DO	GALS	TEMP.
1455	4.61	94	0	10.93	5.0	20.7
1500	4.59	96	0	10.71	6.0	20.8
1505	4.58	97	0	10.81	7.0	20.7

SLOW PUMP – 5 MINS

1510 TAKE 2 VOA SAMPLES

1515 TO IDW STORAGE

1520 MOBE TO MW-36

STATIC LEVEL - 9.50' TUBING - 14'

1525 START PURGING

–	pH	COND	TURB	DO	GALS	TEMP.
1530	5.86	183	310	9.89	1.0	22.8
1535	5.84	169	0	9.52	2.0	22.7
1540	5.92	180	0	9.55	3.0	22.6
1545	5.97	219	0	9.57	4.0	22.3
1550	5.99	212	0	9.55	5.0	22.2

SLOW PUMPING RATE

1555 TAKE 2 – VOA'S

1610 TO IDW STORAGE

1620 TO OFFICE – PAPERWORK + DECON

1730 OFFSITE

B. Kirkham [signature] 11/2/98

[illegible] 11/3/98

11/3/98

0700 SAFETY MEETING, LOAD UP -
CURRENTLY RAIN, EXPECTED
TO CLEAR
0745 MOVE TO MW-42
STATIC LEVEL - 48.50' PUMP - 52'
0755 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0800	5.10	80	108	8.69	1.0	21.2
0805	4.86	60	999	8.62	2.0	21.7
0810	4.70	60	877	8.79	3.0	21.5
0815	4.59	60	303	8.81	4.5	21.3
0820	4.51	61	16	8.79	6.0	21.2
0830	4.65	59	248	8.66	9.0	21.4
0835	4.55	60	29	8.75	10.5	21.2
0840	4.52	61	0	8.76	12.0	21.3
0845	4.50	60	0	8.79	13.0	21.3
0850	4.64	60	0	8.78	14.0	21.4

PULL PUMP
0900 TAKE BAILED SAMPLES MW-42 GW1,
DUPLICATE 42DP & SPLIT 42SP
0920 TO IDW STORAGE
0925 MOVE TO MW-43
STATIC LEVEL - 51.04" PUMP - 54'
0930 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0935	5.26	47	999	9.22	1.0	21.5
0940	4.97	44	150	8.82	2.0	22.9
0945	4.86	45	40	8.83	3.0	22.9
0950	4.76	45	0	8.82	4.0	22.9
0955	4.71	46	0	8.83	5.0	22.7
1000	4.72	46	0	8.82	6.0	22.8

PULL PUMP
1010 TAKE BAILED SAMPLE - 2VOA'S / 1-PPM

11/3/98

11/3/98

1020 TO IDW STORAGE
1030 TO OFFICE - DECON + RECORDS
1055 MOBE TO MW-38
STATIC LEVEL - 57.28' PUMP - 60'
1100 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1105	5.07	49	999	8.90	1.0	22.5
1115	4.92	50	128	9.18	3.0	23.5
1120	4.78	52	40	9.14	4.0	23.4
1125	4.75	52	0	9.06	5.0	23.4
1130	4.72	53	0	8.99	6.0	23.4
1135	4.71	53	0	8.99	7.0	23.1

PULL PUMP
1145 TAKE BAILED SAMPLE 2 VOA'S 1-PP
1155 TO IDW STORAGE - GET DI
1210 MOBE TO MW-51
STATIC LEVEL - 50.21' PUMP - 53'
1215 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1220	5.45	51	999	9.25	1.0	23.6
1225	4.84	47	37	8.87	2.0	23.4
1230	4.76	47	0	8.94	3.0	23.5
1235	4.79	47	0	8.87	4.0	23.9
1240	4.80	47	0	8.86	5.0	23.9

PULL PUMP
1250 TAKE BAILED SAMPLE 2-VOA'S
1300 TO IDW STORAGE
1305 TO OFFICE - DECON + RECORDS
1345 MOBE TO MW-72
/ STATIC LEVEL - 20.07 TUBING - 25'
1350 START PURGING

AK

B Ken Hansen 11/5/98

11/3/98

~~1355~~	pH	COND	TURB	DO	GALS	TEMP
1355	4.95	45	10	10.31	1.0	21.9
1400	4.92	46	~~3.5~~ 10	10.44	2.0	21.7
1407	4.92	48	0	10.10	3.0	21.7
1415	4.87	47	0	9.90	4.0	21.8
1422	4.88	48	0	9.93	5.0	21.8

1425 SLOW PUMPING RATE

1430 TAKE SAMPLE 2-VOA'S

1440 TO IDW STORAGE

1455 TO OFFICE - RECORDS &
PACK + SHIP SAMPLES (GEL)
FROM 11/2 + 11/3

1700 OFFSITE TO FED EX

B Kurt Hansen 11/3/98

A495

B Kurt Hansen 11/4/98

11/4/98

0700 SAFETY MEETING, LOAD -
CLEAR COOL - HIGHS ~70°F
0745 MOBE TO MW-73
STATIC LEVEL - 30.36' PUMP - 33'
0750 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0755	4.79	55	9	8.53	1.0	19.6
0800	4.82	48	0	8.14	2.0	20.2
0805	4.71	45	0	8.22	3.0	20.1
0810	4.72	44	0	8.17	4.0	20.1
0815	4.72	44	0	8.13	5.0	20.5

PULL PUMP
0820 TAKE BAILED SAMPLE AND SPLIT
QA SAMPLE - 2 VOAS 1 PPM 1500C /EA
0830 TO IDW STORAGE
0840 MOBE TO MW-44
STATIC LEVEL - 52.21' PUMP - 55'
0846 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0850	5.50	56	366	8.44	1.0	18.7
0855	4.90	44	198	7.91	2.0	19.9
0900	4.81	43	0	7.74	3.0	20.1
0905	4.77	43	0	7.77	4.0	19.9
0910	4.76	43	0	7.77	5.0	20.1

PULL PUMP
0920 TAKE BAILED SAMPLE - 2 VOA 1-PPM
0930 TO IDW STORAGE
0940 TO OFFICE - RECORDS + DECON
1025 MOBE TO MW-60
STATIC LEVEL - 48.38 PUMP - 52'
1030 START PURGING

BK

[illegible] 1/4/98

11/4/98

MW-60

	pH	COND	TURB	DO	GALS	TEMP
1035	5.22	56	999	8.14	1.0	19.9
1040	4.71	62	999	7.67	2.0	21.6
1045	4.63	64	53	7.84	3.0	21.5
1050	4.66	64	0	7.86	4.0	21.5
1055	4.64	63	0	7.83	5.0	21.8
1100	4.64	64	0	7.84	6.0	21.8

PULL PUMP

1110 TAKE BAILED SAMPLE 2VOAS 1-PAM

1115 TO IDW STORAGE

1120 MOBE TO MW-62

STATIC LEVEL - 37.06' PUMP - 40'

1130 START PURGING

	pH	COND	TURB	DO	GALS	TEMP
1135	5.32	54	568	8.80	1.0	19.8
1140	5.17	58	496	8.50	2.0	20.2
1145	5.02	56	62	8.40	3.0	20.7
1150	4.95	54	0	8.29	4.0	21.0
1155	4.89	52	0	8.32	5.0	20.1
1200	4.87	51	0	8.17	6.0	21.4

PULL PUMP

1215 TAKE BAILED SAMPLE 2VOA's 1-[illegible]

1220 TO IDW STORAGE

1230 TO OFFICE - RECORDS + DECON

1340 MOBE TO MW-49

STATIC LEVEL - 37.78' PUMP - 43'

1347 START PURGING

	pH	COND	TURB	DO	GALS	TEMP
1350	4.99	58	999	8.56	1.0	21.7
1355	5.10	56	819	8.46	2.0	23.0
1400	5.05	57	308	8.67	3.0	23.1

B Kristiansen 11/4/98

11/4/98

MW-~~49~~

—	pH	COND	TURB	DO	GALS	TEMP
1405	4.96	58	56	8.55	4.0	22.9
1410	4.93	56	0	8.83	5.0	23.2
1415	4.94	56	0	8.76	6.0	22.8
1420	4.90	56	0	8.72	7.0	23.0

PULL PUMP

1430 TAKE BAILED SAMPLE - 2VOA'S 1-500C

1445 TO IDW STORAGE

1450 MOBE TO MW-57

STATIC LEVEL - 37.04' PUMP - 40'

1455 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1500	4.89	55	455	8.68	1.0	22.1
1505	4.83	53	97	8.51	2.0	22.0
1510	4.75	52	0	8.75	3.0	22.0
1515	4.72	54	0	8.78	4.0	21.3
1520	4.71	52	0	8.76	5.0	21.4

PULL PUMP

1530 TAKE BAILED SAMPLE 2 VOA'S 1 PPM

1545 TO IDW STORAGE

1555 TO OFFICE - RECORDS, DECON, SHIPPING

1730 OFFSITE

B Hanssen 11/4/98

B. Kurt Hammer 11/5/98

11/5/98

0700	SAFETY MEETING, LOAD UP					
0750	MOBE TO PZ-3					
	STATIC LEVEL - 49.61' PUMP - 52'					
0800	START PURGING - V. TURBID					
—	pH	COND	TURB	DO	GALS	TEMP
0805	5.14	65	999	8.85	1.0	18.0
0810	4.84	50	999	7.80	2.0	20.3
0815	4.70	48	999	7.71	3.0	20.1
0820	4.65	48	999	7.61	4.0	20.4
0830	4.57	49	999	7.63	6.0	20.3
0840	4.71	48	999	7.62	8.0	20.7
0850	4.60	49	611	7.64	10.0	20.6
0900	4.53	49	210	7.40	12.0	20.6
0910	4.48	49	173	7.74	13.0	20.5
0920	4.60	53	122	7.75	15.0	20.1
0930	4.57	50	52	7.76	17.0	20.0
0940	4.55	50	42	7.62	18.0	20.4
0950	4.62	48	62	7.55	20.0	20.7
1000	4.52	49	16	7.80	22.0	20.0
1010	4.51	50	16	7.72	24.0	20.4
	PULL PUMP					
1020	TAKE BAILED SAMPLE 2 VOA'S 1-Ppm					
1030	TO IDW STORAGE					
1040	TO OFFICE FOR DI WATER					
1045	MOBE TO PZ-4					
	STATIC LEVEL - 41.61' PUMP - 45'					
1110	START PURGING					
—	pH	COND	TURB	DO	GALS	TEMP
1115	4.75	31	0	8.46	1.0	19.2
1120	4.70	30	0	8.34	2.0	19.3
1125	4.70	31	0	8.31	3.0	19.7
1130	4.68	31	0	8.30	4.0	19.8
	PULL PUMP					

11/5/98

11/5/98

1140 PZ-4 - TAKE BAILED SAMPLE 2-VOA'S
1150 TO IDW STORAGE
1200 TO OFFICE - RECORDS + DECON
1210 ALAN SHIREY ONSITE
1335 MOBE TO MW-61
STATIC LEVEL - 42.21' PUMP - 43'
1345 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1350	4.81	40	999	8.25	1.0	20.8
1355	4.81	41	49	8.28	2.0	20.7
1400	4.77	43	0	7.77	3.0	21.0
1405	4.71	44	0	7.81	4.0	20.9
1410	4.69	44	0	7.86	5.0	20.8
1415	4.71	44	0	7.85	6.0	20.7

1420 PULL PUMP
1425 TAKE BAILED SAMPLE - 2 VOA'S
TO IDW STORAGE
1500 MOBE TO MW-48
STATIC LEVEL - 40.41' PUMP - 42'
1510 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP.
1515	5.36	53	850	8.31	1.0	19.4
1520	5.33	41	77	7.65	2.0	20.5
1525	5.38	41	0	7.83	3.0	20.6
1530	5.39	41	0	7.89	4.0	20.7
1535	5.38	41	0	7.90	5.0	20.7

1545 FROM BAILER - 321 8.20
1555 TO IDW STORAGE
1605 TO OFFICE - DECON, RECORDS +
SHIP GEL SAMPLES FROM 11/4 + 11/5.
1730 OFFSITE TO FEDEX

[signature] 11/5/98

B Kristensen 11/6/98

11/6/98

0700 SAFETY MEETING, LOAD UP
0730 MOBE TO MW-58
STATIC LEVEL-37.88' PUMP-40'
0735 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0740	5.15	38	999	9.11	1.0	14.6
0745	4.67	42	108	7.60	2.0	17.9
0750	4.63	44	0	7.19	3.0	19.1
0755	4.62	45	0	7.24	4.0	18.9
0800	4.60	46	0	7.19	5.0	19.1
0805	4.61	47	0	7.18	6.0	18.9

PULL PUMP
0815 TAKE BAILED SAMPLE & DO - 2VOA 1-SVOC
0820 TO IDW STORAGE
0825 MOBE TO MW-68
STATIC LEVEL - 51.58' PUMP - 54'
0836 START PURGING

—	pH	COND	TURB	DO	GALS.	TEMP
0840	5.12	26	999	7.76	1.0	17.7
0845	4.83	34	300	7.26	2.0	18.4
0850	4.74	34	50	7.06	3.0	18.9
0855	4.74	34	0	7.12	4.0	18.9
0900	4.72	36	0	7.25	5.0	18.6
0905	4.71	35	0	7.12	6.0	19.5

0915 TAKE METALS / PULL PUMP
TAKE BAILED VOA SAMPLE + DO
0920 TO IDW STORAGE
0930 MOBE TO MW-67 (PERISTALTIC)
STATIC LEVEL - 22.22' TUBING - 25'
0935 START PURGING 0935

BLK

BKirkham 21/6/98

11/6/98

MW-67

—	pH	COND	TURB	DO	GALS	TEMP
0945	4.73	48	0	8.43	1.0	17.8
0950	4.67	49	0	8.24	2.0	17.6
0955	4.62	50	0	8.25	3.0	17.4
1000	4.63	47	0	8.01	4.0	17.8
1005	4.62	47	0	7.87	5.0	17.7
1010	4.61	48	0	7.93	6.0	17.4
1015	4.62	47	0	7.86	7.0	17.8

1020 COLLECT SAMPLES 2VOA 1PPM
1025 TO IDW STORAGE
1030 MOBE TO MW-71
STATIC LEVEL - 18.76 TUBING - 21'
1035 START PURGING - ORGANIC SCENT

HR	pH	COND	TURB	DO	GALS	TEMP.
1040	4.83	42	46	7.60	1.0	18.4
1045	4.81	41	0	7.54	2.0	18.2
1050	4.80	41	0	7.62	3.0	18.2
1055	4.81	41	0	7.60	4.0	18.2

SLOW PUMP
1105 TAKE SAMPLE 2 VOA'S 1 SVOC
1115 TO IDW STORAGE
1125 TO OFFICE - RECORDS, DECON & SHIPPING
1400 TO AUGUSTA

11/6/98

[signature]

11/9/98

11/9/98

0700 SAFETY MEETING, LOAD UP
0750 MOBE TO MW-40
STATIC LEVEL - 30.52' PUMP - 35'
0810 START PURGING

	pH	COND	TURB	DO	GALS	TEMP
0815	6.65	242	207	9.06	1.0	18.2
0820	6.53	212	733	9.01	2.0	18.4
0825	6.40	223	999	8.87	3.0	18.5
0830	6.38	196	60	8.87	4.0	18.8
0835	6.40	186	0	8.87	5.0	18.9
0840	6.38	187	0	8.86	6.0	18.8
0845	6.36	189	0	8.86	7.0	18.7

0850 TAKE METALS SAMPLE - PULL PUMP
TAKE BAILED VOA'S - DO 8.91
0900 MOBE TO MW-47
STATIC LEVEL - 44.18 PUMP - 47'
0905 START PURGING

	pH	COND	TURB	DO	GALS	TEMP
0910	6.09	89	999	9.12	1.0	18.4
0915	5.77	115	999	8.62	2.0	19.7
0920	5.84	121	427	8.53	3.0	19.9
0925	5.81	122	119	8.51	4.0	20.0
0930	5.77	132	999	8.80	5.0	19.3
0935	5.83	120	558	8.75	6.0	19.5
0940	5.79	121	137	8.66	7.0	19.9
0945	5.82	117	275	8.96	8.0	19.4
0955	5.84	122	129	8.68	10.0	20.8
1000	5.86	119	132	8.72	11.0	21.0
1005	5.90	119	130	8.76	12.0	21.1

1015 TAKE METAL & SVOC SAMPLES
PULL PUMP, BAIL VOA DO 8.91
1020 TO IDW STORAGE

B Kesthaman 11/9/98

11/9/98

1040 MOBE TO MW-~~39~~ 45 MIC

STATIC LEVEL - 18.47' TUBING - 20'

1045 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1050	4.71	298	21	10.69	1.0	19.7
1055	4.65	285	50	10.41	2.0	19.8
1100	4.59	284	37	10.31	3.0	19.8
1105	4.65	269	10	11.84	4.0	19.8
1110	4.56	266	0	9.36	5.0	19.9
1120	4.61	265	0	8.24	6.0	20.0
1125	4.59	263	0	8.30	8.0	20.0
1130	4.57	264	0	8.36	9.0	20.0

1135 TAKE SAMPLE 2VOA's 1-SVOC

1155 MOBE TO MW-39

STATIC LEVEL - 7.87' TUBING - 10.0'

1157 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1200	5.70	175	0	8.72	1.0	21.4
1205	5.86	128	48	14.22	2.0	21.2
1210	5.93	128	542	15.34	3.0	21.0
1220	5.96	134	958	13.06	5.0	21.0
1230	6.05	145	154	7.85	8.0	21.2
1240	5.98	151	86	9.35	9.0	21.1
1245	5.97	158	31	13.62	10.0	21.0
1250	5.96	163	24	14.94	11.0	20.9
1255	5.97	167	25	12.26	12.0	21.1
1300	5.92	169	20	9.05	13.0	21.2

1305 TAKE SAMPLE 2-VOA's 1-PPM 1-SVOC

TO IDW STORAGE

TO OFFICE - RECORDS + DECON

GRUNDFOS PUMPS & UNLOAD PERISTALTIC

[illegible signature] 11/9/98

11/9/98

1400 MOBE TO MW-56

STATIC LEVEL - 33.50' PUMP - 36'

1401 START PURGING

	pH	COND	TURB	DO	GALS	TEMP
1405	6.21	191	999	9.88	1.0	23.0
1410	6.11	212	999	11.12	2.0	23.5
1420	6.31	205	255	8.88	4.0	23.9
1425	6.27	199	112	11.69	5.0	23.7
1430	6.21	198	108	X9.99	6.0	23.0
1435	6.23	199	67	X9.20	7.0	23.2
1440	6.20	197	58	8.91	8.0	23.3
1445	6.14	195	37	10.65	9.0	23.3
1450	6.22	192	42	9.83	10.0	23.2
1455	6.21	194	40	8.77	11.0	22.8

1500 PULL PUMP - TAKE BAILED SAMPLE

2-VOA'S ONLY

1520 TO IDW STORAGE

1535 TO OFFICE - RECORDS & DECON

1700 OFFSITE

11/9/98

[signature]

B Kyle Hamm 11/8/23

11/1?/98

700 SAFETY MEETING, LOAD UP
0745 MOBE TO MW-55
STATIC LEVEL - 27.50' PUMP - 32'
0750 START PURGING - V. TURBID

—	pH	COND	TURB	DO	GALS	TEMP
0755	5.44	125	999	8.91	1.0	19.5
0800	5.92	160	999	8.33	3.0	20.1
0810	5.95	172	999	8.62	5.0	19.4
0820	5.98	180	804	8.39	7.0	19.9
0825	6.12	181	521	8.14	8.6	19.9
0830	6.11	184	242	8.23	9.0	19.8
0835	6.05	184	37	8.22	10.0	19.7
0840	6.08	183	22	8.17	11.0	19.8
0845	6.04	185	16	8.42	12.0	19.7
0850	6.24	184	14	8.24	13.0	18.8
0855	6.00	184	14	8.26	14.0	19.8

0900 PULL PUMP - TAKE VOA SAMPLE
BAILER DO 8.22
0905 TO IDW STORAGE
0915 MOBE TO MW-70
STATIC LEVEL - 31.14' PUMP - 35'
0925 START PURGING - V. TURBID

—	pH	COND	TURB	DO	GALS	TEMP
0930	5.57	54	999	8.60	1.0	19.5
0935	5.47	54	999	7.65	2.0	20.6
0945	5.23	55	999	7.59	4.0	21.7
0955	5.33	57	999	7.95	5.0	20.5

1005 ALLOW TO RECOVER ~~6.0~~
USE PUMP TO PURGE/DEVELOP WELL

1030	5.45	52	781	7.73	10.0	19.9
1040	5.33	52	484	8.13	11.0	20.1
1050	5.28	53	317	7.79	12.0	20.8

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11/11/98

MW-70

—	pH	COND	TURB	DO	GALS	TEMP
1110	5.29	53	306	8.38	13.0	19.4
1120	5.19	52	359	7.43	14.0	20.9
1125	5.18	51	155	7.23	14.5	21.4
1130	5.21	50	109	8.16	15.0	19.6

1140 PULL PUMP - TAKE BAILED VOA
DO - 8.31

1150 TO IDW STORAGE

1200 TO OFFICE - DECON & RECORDS

1310 MOBE TO MW-69
STATIC LEVEL - 45.48' PUMP - 47'

1315 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1320	5.06	37	367	8.30	1.0	19.1
1325	4.83	40	361	7.47	2.0	20.9
1340	4.75	39	178	7.33	3.0	20.5
1350	4.78	41	123	7.34	4.0	22.8
1355	4.75	41	47	7.36	4.5	22.3
1405	4.73	40	50	7.32	5.0	21.3

1410 PULL PUMP - TAKE BAILED VOA
DO - 7.46

1425 MOBE TO PZ-6 - PERI
STATIC LEVEL - 18.05 TUBING - 25'

1435 START PURGING - HEAVY MUD IN BOTTOM

—	pH	COND	TURB	DO	GALS	TEMP
1440	4.60	50	36	7.57	1.0	21.0
1445	4.60	48	221	8.26	2.0	20.9
1450	4.61	47	167	8.43	3.0	20.6
1455	4.65	46	87	8.23	4.0	20.6
1500	4.60	47	45	8.32	5.0	20.9

11/11/98

11/11/98

PZ-6 CON'T.

	pH	COND	TURB	DO	GALS	TEMP
1505	4.58	47	29	8.81	6.0	20.9
1510	4.57	47	19	8.64	7.0	20.8
1515	4.58	47	27	9.04	8.0	20.9
1520	4.57	47	17	9.08	9.0	21.0

1530 TAKE SAMPLE 2 VOA'S 1-SVOC
1545 TO IDW STORAGE
1555 TO OFFICE - DECON, RECORDS, SHIP
SAMPLES FROM 11/9 + 11/11.
1730 OFFSITE

B Kuthan

11/12/98

11/12/98

0700 SAFETY MEETING, TAKE RINSATE FROM PUMP FOR MW-66

0730 MOBE TO MW-66

STATIC LEVEL - 32.08' PUMP - 36'

0740 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0745	4.79	75	999	8.75	1.0	15.3
0750	4.70	68	999	7.79	2.0	18.1
0755	4.73	67	416	7.54	3.0	18.5
0800	4.74	67	201	7.47	4.0	18.7
0805	4.80	67	129	7.64	5.0	18.9
0810	4.75	66	91	7.57	6.0	18.9
0815	4.79	65	89	7.40	7.0	19.0
0820	4.76	66	82	7.67	8.0	18.5

PULL PUMP AFTER 1 500C HPPM

0830 BAILED VOA SAMPLE - DUMP 10W

0850 MOBE TO MW-64

STATIC LEVEL - 32.01' PUMP - 35'

0900 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
0905	5.47	130	999	8.05	1.0	16.4
0915	5.73	137	999	8.55	3.0	15.0
0925	5.87	133	666	7.59	5.0	18.0
0930	5.90	131	371	7.44	6.0	18.3
0935	6.01	126	194	7.73	7.0	18.2
0940	5.78	127	96	7.77	8.0	18.4
0945	5.87	125	29	7.70	9.0	18.2
0950	5.91	124	18	7.75	10.0	17.9
0955	5.88	124	10	7.74	11.0	17.9
1000	5.92	123	8	7.70	12.0	17.9

1010 TAKE 1-PPM, PULL PUMP - TAKE BAILED VOA'S - DO 7.77

11/12/98

1015 MOBE TO MW-65
STATIC LEVEL - 25.20' TUBE - 30'
1020 START PURGING - PERISTALTIC

—	pH	COND	TURB	DO	GALS	TEMP
1025	6.16	155	999	8.01	0.5	16.9
1035	5.80	124	470	7.95	1.5	17.5
1040	5.78	109	451	7.55	2.0	17.6
1045	5.80	125	98	7.93	2.5	17.4
1050	5.80	112	35	7.85	3.0	17.5
1055	5.73	108	31	7.99	3.5	17.5
1100	5.73	109	7	7.06	4.0	18.0
1105	5.76	107	7	8.02	4.5	17.9
1110	5.72	104	7	7.93	5.0	17.8

1115 TAKE SAMPLE - 2 VOA'S
TO 10W STORAGE & OFFICE, UNLOAD
1220 MOBE TO PZ-5
STATIC LEVEL - 16.65' TUBING - 20'
1230 START PURGING - HEAVY MUD IN BOTTOM

—	pH	COND	TURB	DO	GALS.	TEMP
1235	5.79	109	999	8.53	0.5	20.9
1240	5.78	105	760	8.06	1.0	20.7
1245	5.95	155	999	8.21	1.5	20.4
1250	5.97	152	716	8.42	2.0	20.6
1300	6.00	157	531	8.43	3.0	20.5
1310	6.07	153	220	8.62	4.0	20.3
1320	5.93	154	230	8.71	5.0	20.6
1325	6.01	154	224	8.79	5.5	20.5

1330 TAKE SAMPLE 2 VOA'S 1-PPM
1340 MOBE TO MW-63
STATIC LEVEL - 7.30' TUBE - 11'
1345 START PURGING

[illegible] 11/12/98

11/12/98

MW-63

—	pH	COND	TURB	DO	GALS	TEMP
1350	6.43	397	22	9.31	0.5	20.6
1355	6.34	396	12	8.92	1.0	20.4
1400	6.38	356	6	8.96	1.5	20.4
1405	6.32	263	6	8.87	2.0	20.2
1415	6.15	214	3	8.34	3.0	20.3
1425	6.01	184	2	8.56	4.0	20.1
1430	5.92	169	3	8.57	4.5	20.4
1435	5.94	164	1	8.29	5.0	20.4
1440	5.98	176	1	8.50	5.5	19.9
1445	5.92	170	1	8.61	6.0	20.0

1450 TAKE 2 VOA SAMPLES

1500 MOBE TO MW-12

STATIC LEVEL 5.22 / TD 18.83 TUBING 12'

1505 START PURGING

—	pH	COND	TURB	DO	GALS	TEMP
1510	4.61	167	214	8.90	0.5	19.5
1520	4.78	162	15	8.59	1.5	19.4
1525	4.81	163	60	8.47	2.0	19.4
1530	4.89	164	39	8.92	2.5	19.1
1535	4.85	163	24	8.85	3.0	19.2
1540	4.86	159	18	9.22	3.5	19.3

1545 TAKE SAMPLES 2 VOA 1 PAM

1605 TO IDW STORAGE

1610 TO OFFICE - RECORDS, DECON

1700 OFFSITE

11/12/98

B. [illegible]

RECORD

MNOP/AIP

Book No 7

March 2, 2000 –

March 2, 2000

1000 J. Furlow, P. Albenesius, A. Smits, and Franz Froelicher (USACOE) meet at Building 7 in Allied Industrial Park to look at and stake proposed sampling locations. Went to offices of Politex, met with Neal Watson, who gave permission to go on Politex property. Combination to Politex gate is 1234. Exit code is on back of control box. Put metal post at location of ISL-117. Went to Armstrong offices, met with Bennie Knowles at scale house. Put out stakes at proposed locations for CPT sampling on Armstrong property: from North to South, IGW-201, IGW-202, IGW-203, IGW-204.

MW-48 and MW-57 behind (on south side) Politex buildings could not be found due to pad construction and storage of bales/pallets.

Staked locations of ISL-201 (adjacent to MW-45), ISL-202, ISL-203, ISL-204, ISL-205, and ISL-206 on west side of AIP and on Armstrong property (All centered around ISL-117). Staked two CPT locations on south side of Johns-Manville plant (IGW-205 and IGW-206); staked ISL-207 next to northern Johns-Manville building on south side of building (warehouse). Staked ISL-208 diagonally across street from MW-35, in grassy area. Staked ISL-209 and ISL-210; ISL-210 is in front of Hebco Engineering building; ISL-209 is across street from Hebco.

Staked IGW-207 south of MW-69, IGW-208 south of IGW-207, and IGW-209 south of MW-70.

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J. W. Fuller March 2, 2000

March 2, 2000 (Continued)

Staked surface water/sediment sampling locations ISW/ISD-202, ISW/ISD-203 and ISW/ISD-204 from just north of MW-67 downstream to MW-14 (ISW/ISD-202 just north of MW-67, ISW/ISD-204 at MW-14).

Came back by Politex offices, got out and looked for MW-48 in new building pad area. Finally located MW-48 well housing and pad where it had been uprooted and pushed over against west fence. No sign of remaining portion of well.

J. W. Farlow
March 21 2000

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J Waterlow 3/6/2000

March 6, 2000

0930 J. Furlow and M. Gilchrist arrive at SAIC field office.

1000 A. Johnson and S. Stroud arrive at SAIC field office.

1020 J. Furlow conducts pre-entry Health and Safety orientation. Subjects discussed: site contaminants and contamination; field hazards such as ticks, yellow jackets, snakes; policy on injuries to personnel or exposure of personnel to contaminants/hazardous materials; route to nearest hospital; use of personal protective equipment in sampling and handling of samples.

1040 Field personnel deconning mixing bowls, spoons, hand auger buckets.

1145 Break for lunch.

1310 Field sampling team at Politex-Armstrong property line, preparing to begin hand augering on location ISL-201, adjacent to MW-45.

1330 Began hand augering ISL-201, ~~0'-2'~~ AMJ

1345 Pull first sample from 0'-2' section. (Using Encore sampling devices and containers) Encountered brown, soft SAND. (ISL-201-01)

1405 Pulled next sample from 2'-4'. Same material coarse sand at 3.5' (ISL-201-02)

1420 Pulled sample from 4'-6'. Same material with some clays. (ISL-201-03)

1430 Sampled from 6'-8'. Silty SAND at 6'. (ISL-201-04)

1450 Sampled 8'-10'. Same material. (ISL-201-05)

1505 Began moving equipment to next location, ISL-202, for second hand augur. M. Gilchrist offsite to pick up more bags of bentonite.

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A.M. Johnson March 6, 2000

March 6, 2000 (continued)

1520 M. Gilchrist back onsite with bentonite. Fill ISL-201 hole with bentonite, 50 lb. bag with 3/8" pellets.

1530 Hand augur ISL-202, 0'-2'. This location is ~~100~~ AMJ about 100 ft. north of ISL-201, across a small ditch. Clayey SAND found in this first section of this hole (ISL-202-01)

~~1500 Hand augured to 2'-4'. Sandy CLAY found here (ISL-202-02)~~ AMJ

1545 Rinsate done for ISL-202-02C

1600 Hand augured to 2'-4'. Sandy CLAY found here (ISL-202-02).

1615 Hand augured to 4'-6' (ISL-202-03). At 4.5', silty SAND found. Wet. Duplicate made for this sample (ISL-202-03A).

1635 Augured 6'-8'. Same material (ISL-202-04).

1650 Augured 8'-10'. Sample is inundated from 8'-9.5', then drier at 9.5'. Perhaps this is a perched water lens. Light gray (N8) clayey SAND now mixed with yellowish-orange (10YR 6/6) clayey SAND. (ISL-202-05)

1700 Began packing up equipment.

1715 Offsite to pack samples. Stop by Politex building to notify them that we are leaving.

1730 Packed samples. Organized equipment for tomorrow's sampling, SAIC field office.

1900 Took samples to Fedex.

March 6, 2000
A.M. Johnson

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A.M. Johnson March 6, 2006

March 7, 2000

Project: Allied Industrial Park Soil Sampling

Personnel: Jim Furlow, Scott Stroud, Mike Gilchrist, Amy Johnson

Weather: Clear, cool

Location: Hand auger borings on west side of AIP (AIP/Armstrong property line).

0740 All personnel at SAIC field office.

0750 J. Furlow conducts daily tailgate health and safety briefing; discuss heat stress, need to take breaks when doing hard work, need to drink plenty of fluids during the day.

0755 Field team decoming auger buckets, stainless steel bowls and spoons.

0850 Field team leaves SAIC office to begin sampling by hand auger.

0855 Onsite. Set up to sample ISL-203

0910 Begin auguring.

0930 Collect sample from 0'-2' (ISL-203-01). various types of silt. More clays towards bottom.

1000 Collect sample from 2'-4' (ISL-203-02). silty Clay found here. Water encountered at 4 ft.

1010 Sampled ISL-203-03 at 4'-6'. Wet silty SAND found here. Could not sample any further because sand was too loose for augur. Noted now that this location is approximately 75 ft. north-northwest of ISL-202, and ~~to~~ ^ams^ approximately 10 feet south of a very deep (~8ft) storm drain that contains water.

1040 Packed up and began moving equipment

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A.M. Johnson 03-07-00

March 7, 2000 (continued)
1105 Began hand auguring ISL-206, which is located approximately 150 feet northeast of ISL-203, and across dirt road.
1120 First sample collected (ISL-206-01) at 0'-2'. Sandy SILT found.
1135 Sampled 2'-4' for ISL-206-02. Found the same material except for a thin clay lens. Water at 3.75'.
1155 Sampled ISL-206-03 at 4'-6'. Clean ~~sand san~~ tny found here. Saturated.
1215 Sampled ISL-206-04, 6'-8'. Same material.
1230 Sampled ISL-206-05 at 8'-10'. Same sand material, though much tighter. Made duplicate sample (ISL-206-05D) here.
1250 Began packing up. Took pictures.
1310 Drove back to SAIC field office to soak augur buckets, Offsite.
1315 Arrived at SAIC field office. Soaked augur buckets.
1330 Left SAIC field office for lunch.
1430 Arrived back at SAIC field office. Deconed.
1505 Left field office to go to ISL-207 location.
1510 Set up at ISL-207. Strong hydrocarbon odor in the air.
1515 Begin hand auguring. Location is approximately 3 ft. south of Johns Mansville metal warehouse building, and 4 ft. north of parking spaces/area.
1520 First sample (ISL-207-01) at 0'-2'.

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A.M. Johnson 03-07-00

March 7, 2000 (continued)
Sand encountered until 1.5 ft, then a sandy clay (tight).
1550 Collected second sample at 2-4'. (ISL-207-02). Sandy clay (tight) again. Duplicate, ISL-207-02A, collected here.
1605 Sampled at 4-6', ISL-207-03. Same material, until 5', then clayey silt (loose)
1620 Collected ISL-207-04 at 6-8'. clayey silt again (loose).
1645 Begin packing up for the day.
1655 Left site of SAIC field office.
1700 At field office, packing samples for shipment.
1755 Leave for Fedex.
1800 Arrive at Fedex. Deliver samples.

Note: At 1330 J. Furlow met with Call Before You Dig representative to check CPT locations (9) for possible presence of underground gas pipeline. C.B.Y.D. representative said that all 9 proposed CPT locations were clear of gas pipeline.

At 1535 J. Furlow met with Call Before You Dig Georgia Power Co. representative to check all 9 proposed CPT locations for underground power lines. Georgia Power Co. representative said all 9 proposed locations were clear of underground power lines.

J. W. Furlow
March 7, 2000

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A. M. Johnson 03-07-00

March 8, 2000
0735 SAIC field team at SAIC field office. Personnel: J. Furlow, S. Stroud, A. Johnson, M. Gilchrist. Weather: Clear and cool, warming up. Team will continue hand augering for soils.
0750 Deconning sampling equipment used on previous day.
0830 Deconning of sampling equipment completed.
0840 J. Furlow conducts daily tailgate Health and Safety briefing; discuss setup at ISL-208 and need to keep street clear of obstructions; drinking fluids and monitoring heart rate while working as day warms up; work schedule for today.
0900 Organize equipment and sample supplies.
0920 Drive to first auguring site, ISL-208. This is located at a grassy corner near the main road in the Johns Mansville property. Checked in office. Brian Bobe escorted us.
0935 Begin auguring at ISL-208.
0945 Collected first sample, ISL-208-01, at 0'-2'. Loose to tight clayey SAND.
1005 Sampled ISL-208-02 at 2'-4'. Same material, though mottled.
1035 Sampled ISL-208-03. Silty sand here at 4'-6'. Sampled again, ISL-208-03B for a split sample.
1100 Sampled at 6'-8' for ISL-208-04. Essentially same material though more ~~more~~ [AMS] a clayey silt instead. Lab duplicates collected.
1115 Started packing up.
1125 Offsite to check out at Johns Mansville office.

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03-08-00 A.M. [illegible]

March 8, 2000 (continued)
1130 Left for SAIC field office.
1135 Arrived at field office. Deconed.
Phil Albenesius is at field office to
deliver filters and extra bentonite.
1210 Left field office for lunch.
1315 Arrived back at field office. Packed
up deconed sampling equipment. ~~Phil~~ AMJ
~~Albenesius leaves the field office to~~
1325 Left field office with bentonite
to fill in ISL-203, ISL-206, ISL-207,
ISL-208, and ISL-209 with bentonite.
(Amy Johnson and Scott Stroud). The
following lists the quantity of bentonite
each hole received (in order completed):
ISL-203 : hole collapsed, only 6" bentonite.
ISL-206 : took 1/3 of a bag
ISL-207 : took 3/4 of a bag
ISL-208 : took 3/4 of a bag
~~ISL-209 : took 3/4 of a bag~~ AMJ
1350 A. Johnson and S. Stroud meet
M. Gilchrist at ISL-209 location. This
is located across the street from the
Hebco building in the ~~middle~~ AMJ middle of grassy area
1405 Sample first at 0'-2' (ISL-209-01)
Sandy silt to clayey sand collected.
Split sample (ISL-209-01B) also collected
here.
1420 Collected sample at 2'-4' (ISL-209-02).
Same material, though sandy silt at 3.5'.
1445 Sampled ISL-209-03 at 4'-6'. Changes
from sandy silt to clayey silt at 5'.
1505 J. Furlow and P. Albenesius arrive
onsite to discuss tomorrow's plans and

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A.M. Johnson 03-08-00

March 8, 2000 (continued)

location of ISL-210 and ISL-211.

1530 Take break to drink water, etc.

1540 Resume sampling.

1550 Sample last section, ISL-209-04, at 6'-8'. Same material as ~~4'-6~~ AMJ 5'-6' in last sample.

1605 Begin packing up.

1610 Fill hole with 3/4 bag of bentonite.

1620 Return to SAIC field office. Offsite.

1630 Decon. Discuss tomorrow's plans. Organize equipment. Ensure that all sampling materials are accounted for and in order. Discuss ~~possibility of~~ AMJ need for another surface water sampling filter.

1750 Leave SAIC field office for Fedex.

1800 Deliver samples for today at Fedex.

A.M. Johnson
03-08-00

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A.N. [illegible] 03-08-08

March 9, 2000

Project: Allied Industrial Park soil sampling

Personnel: Jim Furlow, Scott Stroud, Mike Gilchrist, Amy Johnson.

Weather: Clear, cool, warming up

0730 Field team at SAIC field office. Begin packing up for continuation of hand augering.

0815 J. Furlow conducts daily tailgate safety briefing; discuss need to watch for snakes when walking through woods to do surface water/sediment sampling later today. Also need to avoid touching vines on trees, since they are probably poison ivy vines.

0820 Field team going to hand auger at location ISL-211.

0825 Team onsite to hand auger ISL-211. Location is approximately 100 ft. east of Hebco building and inside small ditch which is approximately 1 foot deep.

0845 Took first sample at ISL-211-01 Silts and clayey sand. (0'-2')

0910 Sampled ISL-211-02 at 2'-4'. clayey silt.

0930 Packed up. Took pictures.

0940 Drove back to SAIC field office. Offsite.

0945 At SAIC field Office, organized field equipment for sediment and surface water sampling. Also organized for ~~test of hand bager auger~~ AM ISL-210 to be done after lunch.

1005 J. Furlow, A. Johnson, S. Stroud, + M. Gilchrist

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03-08-08

AM Jalmon

March 9, 2000 (continued)
drive to 1SW-203 and 1SD-203
(surface water and sediment) sampling
locations. Calibrated Horiba to AutoCal solution.
1010 Onsite at 1SW-203 and 1SD-203 at
Rocky Creek drainage / Politex property.
Set up next to ~~at~~ AMS sampling locations.
1040 Take first sample at 1SW-203-01
(surface water). Water is still though
has depth ample enough to collect
with metal bowl. Take filtered and
unfiltered samples. Also took split
samples (for Accura) of filtered
and unfiltered surface water samples.
1SW-203-01 = unfiltered, 1SW-203-01F =
filtered sample, 1SW-203-01B = split
unfiltered sample, 1SW-203-01BF =
split filtered. Had trouble working
filter pump. Solution was to trigger
pump switch.
1130 ~~Took~~ Prepared for (AMS) 1SD-203-01 and split
1SD-203-01B sediment samples. ~~We~~
~~dipped and pushed Encore sampler~~
~~straight into sediment. Also did~~ (AMS)
1135 ~~1200~~ Jim went back to field lab to
(AMS) retrieve 5 more Encore sample containers
for lab QC samples.
(AMS) 1145 ~~1210~~ Jim returns. We took 1SD-203-01
and split 1SD-203-01B sediment
samples. Successful Method was to dip and
push Encore sampler straight into
sediment.
1200 Packed up supplies.
1205 Field team offsite.

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A.M. Johnson 23-09-00

March 9, 2000 (continued)

1210 Field team back at SAIC field office. Put samples together into respective split lab containers. Organized
1225 Field team left office for lunch.
1325 Field team returns from lunch. Organized further for ISL-210 hand auger.
1330 Left field office for ISL-210 location.
1335 At ISL-210 location, set up. S. Stroud notifies Hebco building personnel that we are on their property. ISL-210 location is approximately 40 feet ~~north of~~ (AMJ) north of Hebco building and 40 feet south of central road.
1350 Took first sample, ISL-210-01, at 0'-2'. Started with sandy silt, then ~~sandy clay~~ (AMJ) clayey sand.
1410 Sample ISL-210-02 taken at 2'-4', with clayey sand.
1430 Sample ISL-210-03 taken at 4'-6', with silty sand and some clays.
~~1450 Sample ISL-210~~ (AMJ) Duplicate sample, ISL-210-03A taken here.
~~1450 Began packing up. Told Hebco personnel that they shouldn't remove auger stakes when mowing.~~ (AMJ)
~~1500 Offsite.~~
~~1505 At SAIC field office, packing samples. J. Furlow leaves to buy more ice.~~
1450 Sampled ISL-210-04 at 6'-8'. Same material.
1500 Packed up. Told Hebco personnel that they shouldn't remove auger stakes

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A.M. Blumer 03-05-00

March 9, 2000 (continued)

when mowing.

1510 Offsite

1515 At SAIC field office, packed samples.

J. Furlow left for a while to buy ice.

Packed samples. Deconed. Discussed

tomorrow's sampling events.

1730 Field team left SAIC field

office.

1735 Delivered sample containers to

Fedex

A.M. Johnson

03-09-00

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03-09-00

March 10, 2000

Project: Allied Industrial Park Soil Sampling

Field Personnel: Jim Furlow, Scott Stroud, Mike Gilchrist, Amy Johnson

Weather: Cloudy, warm, humid

0745 Field team at SAIC field office. Preparing sample container kits for surface water/sediment sampling.

0810 J. Furlow conducts daily tailgate health & safety briefing. Restated need to watch for snakes around surface water/sediment sampling locations, especially in rainy weather, as is probable today.

0820 Did rinsate for ISD-201-01C.

0840 Left field office for ISD-201-01 location.

0845 At location, set up.

0850 Took ISD-201-01 sample. Politex building is to the north and sediment sample lies in wet ditch (not inundated).

0910 Field team offsite, heading towards field office.

0915 At field office, prepare sample containers.

0940 Left field office.

0945 Arrive at ISW-202 sample location. Set up.

0955 Take ISW-202-01, ISW-202-01A (duplicate), ISW-202-01F, ~~and~~ (MS/MSD) (filtered), and ISW-202-01FA (filtered duplicate) samples. Having trouble with filter. Jim Furlow leaves to purchase new pump.

1030 Collect ISD-202-01 and ISD-202-01A (duplicate).

1055 J. Furlow returns and calls P. Albenesius when problem still is, 4

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A.M. Johnson 03-10-00

March 10, 2000 (continued)
~~fixed~~ Eventually, full sample is ~~recovered~~ (AMJ) collected.
1145 Field team offsite for lunch.
1245 Return from lunch at SAIC field office. Organize sampling equipment.
1305 Leave for ISD-204 location.
1310 Arrive at sampling location (ISD-204), which is approximately 20 feet northeast of MW-14, and approximately 40 feet south of the old railroad tressle berm.
1330 Sampled ISD-204-01. Sediment ~~is light~~ (AMJ) clay rich. Field team was unable to recover a surface water sample though ~~it was~~ (AMJ) there was standing water there yesterday.
1405 Packed up. Took pictures.
1410 Field team offsite, heading towards field office.
1415 At field office, field team packs up, organizes equipment and supplies, packs samples.
1655 Field team leaves SAIC field office and AIP property to head home.
1700 All samples delivered to Fedex.

AM Johnson
03-10-00

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J W Furlow 3/21/00

March 22, 2000

Project: Allied Industrial Park Groundwater Sampling

Field Personnel: Jim Furlow

CPT Subcontractor: Gregg In Situ – Terry Hornsby, operator; Steven Stiles, assistant

0915 J. Furlow at SAIC field office to meet with Gregg In-Situ for CPT groundwater sampling.

1015 Gregg In Situ crew at AIP to do groundwater sampling.

1030 J. Furlow conducts Pre-Entry Health and Safety Briefing for Gregg personnel. Review site hazards, contaminants of concern, underground utilities.

1110 DPT truck and personnel at sample location IGW-207. Setting up rig.

1140 Begin lift push to determine depth to groundwater at IGW-207.

1152 Lift push tool depth 30.05 feet. Tool is in water. Conducting ~~displacement~~ dispersion JWF 3/22/00 test to determine water table depth.

1158 ~~Displacement~~ Dispersion JWF 3/22/00 test indicates water level is at depth of about 25 feet. Pushing on to 40 feet.

1203 Lift push terminated in dense clay at 40.03 feet below ground surface.

1220 Lift push hole grouted up to ground surface.

1225 Moving forward 3 feet to push for water sample.

1245 Sampling tool pushed to depth of 30 feet. Waiting for tool to fill with water.

1305 No water at 30 feet. Pulling tool back to 27 feet.

1310 No water at 27 feet. Pushing deeper.

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JW Fuchs 3/22/00

March 22, 2000 (Continued)

1334 Sampling tool pushed to depth of 40.03 feet, retracted 3 feet to open up.

1345 Groundwater samples IGW-207-01 and IGW-207-1A (Duplicate) collected by bailer at IGW-207 location (3 40 ml-vials for each sample). Samples preserved on ice in cooler. Sampling depth ~~40.03 feet~~ JWF 3/22/00 37.03 to 40.03 feet.

1400 SDPT rig moving to IGW-209 sampling location. Gregg crew grouting up IGW-207 hole to ground surface.

1415 Begin pushing sampling tool at IGW-209 location (south of MW-70).

1428 Sampling tool pushed to depth of 35.04 feet, retracted 3' to open tool.

1440 Groundwater sample IGW-209-01 collected from depth of 32.04' to 35.04'. 3 40-ml. vials collected at location IGW-209, using stainless bailer.

1510 Crew deconning push rods and sampling tool with steam cleaner. IGW-209 hole grouted up to ground surface.

1523 Moving to IGW-208 Sampling location.

1530 Begin pushing sampling tool at IGW-208 location.

1541 Sampling tool pushed to depth of 30.05 feet, retracted 3 feet to open tool up.

1545 No water at 30 feet. Pushing sampling tool down to 35 feet.

1558 Sampling tool pushed to depth of 35.04 feet and retracted 3' to open up.

1605 Groundwater sample IGW-208-01 collected from depth of 32.04 to 35.04' with stainless steel bailer. 3 40-ml vials collected at location IGW-209, just north

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J.W. Zurbeu 3/22/00

March 22, 2000 (Continued)

of City of Macon Wastwater Treatment Plant.
Crew pulling sampling tools out of hole.
1615 Gregg crew grouting up IGW-208 hole
to ground surface.
1630 Sampling team leaving IGW-208.
Hole grouted up. J. Furlow to SAIC
field office to pack and ship samples
collected.
1800 All samples collected today packed on
ice in cooler, ready to go to Fed Ex.
1810 Cooler delivered to Fed Ex for shipment
to GEL.

J. W. Furlow
3/22/2000

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J.W. Fowler 3/23/2000

March 23, 2000

Project: Allied Industrial Park DPT Groundwater Sampling

Field Personnel: Jim Furlow, Terry Hornsby, Steve Stiles

DPT Subcontractor: Gregg InSitu, Aiken, S.C.

0720 DPT rig and all field personnel at SAIC field office.

0730 J. Furlow conducts Daily Health & Safety Tailgate briefing - discuss contaminants of concern at today's sampling locations, site hazards.

0735 Crew at first sampling location, IGW-205.

0750 Helper hand augers to depth of 5.5 feet at IGW-205 location. No obstructions encountered.

0755 Setting up on IGW-205. Waiting for Johns Manville office to open so that I can sign everyone in before starting work.

0810 Crew signed in at Johns Manville office, J.M. supervisor has looked at both sites to be sampled, asked to be notified when we are ready to move.

0821 Begin pushing sampling tool at IGW-205 location.

0825 Tool hit refusal at depth of 12.86 feet. Preparing to move over.

0838 Hand augered to depth of 5.5 feet at new location for IGW-205 approximately 30 feet south of original location - no obstructions encountered.

0845 Begin pushing on new location.

0850 Tool hit refusal at depth of 10.56 feet.

0905 Moving over to try new push location.

0907 Begin pushing at third location.

0911 Tool hit refusal at 10.37 feet.

0915 Called Phil Albenesius - he said to move to IGW-206 and try that location, then call

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/JW [signature] 3/23/00

March 23, 2000 (Continued)

back and we would decide how to proceed from there.

0934 Gregg crew filling all three holes with Hole Plug™ bentonite chips.

0950 Moving rig to sample location IGW-206.

1000 IGW-206 location hand augered to depth of 5.5 feet; no obstructions encountered.

1008 Begin pushing on location IGW-206. Hit very dense clay at depth of 10.5 feet, were able to push through (barely). Clay was about 10 feet thick.

1041 Sampling tool pushed to depth of 45.01 feet, retracted 3 feet to open tool.

1050 No water at 45 feet. Pushing on to depth of 50 feet. Tool pulled from hole so clean tool can be put on, lowermost 1 foot of sampling tool was wet. Water table probably at depth of about 44 feet at IGW-206.

1103 Sampling tool pushed to depth of 50.00 feet, retracted 3 feet to open tool.

1110 Groundwater sample IGW-206-01 collected from depth of 47.00 feet to 50.00 feet. 3 40-ml vials collected at location IGW-206, using stainless steel bailer.

1140 Moving rig back over to IGW-205 sample location.

1155 Begin pushing at new IGW-205 location approximately 40 feet east of original staked location.

1213 Sampling tool pushed to depth of 50.13 feet, retracted 3 feet to open tool.

1220 Groundwater sample IGW-205-01 collected from depth of 47.13 feet to 50.13 feet. 3 40-ml vials collected at location

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JW Barlow 3/23/2000

March 23, 2000 (Continued).

IGW-205, near Southwest corner of Johns Mauville building. All samples packed on ice in cooler.

1245 Called Phil Albenesius for instructions on whether or not to demobilize Gregg DPT rig. Phil will call Tim Clary at Gregg and then call me back.

1300 Packing groundwater samples for shipment to GEL. Gregg crew on standby.

1405 Phil Albenesius called to say Gregg crew should demobilize back to shop. Will remobilize to collect samples on Armstrong property later.

1420 Gregg crew off site.

1705 All paperwork/documentation completed, cooler with groundwater samples from IGW-205 and IGW-206 delivered to FedEx for shipment to General Engineering Labs.

J. Furlow off site.

J. W. Furlow 3/23/2000

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J.W. Furlow 05/22/00

May 22, 2000

Project: Completion of Soil Sampling at Allied Industrial Park

Field Personnel: Jim Furlow, Bruce Kristiansen

1000 J. Furlow and B. Kristiansen at Allied Industrial Park SAIC field office. Organizing equipment for sampling.

1040 J. Furlow conducts daily Health + Safety Tailgate briefing.

1125 PID calibrated to 100 ppm Isobutylene. Calibrated to 100.0 ppm; gas lot # LTE150CM.

Going to lunch, get field supplies

1250 Sample no. ISL-210-01C (Rinsate) collected from D.I. Water poured over auger head to be used for augering soil boring ISL-210.

1310 J.F. and B.K. at ISL-210 location in front of HEBCO building. Begin hand augering.

1345 Soil sample ISL-210-01 collected (3 Encore tubes, 1 4oz jar) from 0'-2'.

1400 Soil samples ISL-210-02 and ISL-210-02A (Duplicate) collected from 2'-4' interval (3 Encore tubes, 1 4oz jar for each).

1430 Soil samples ISL-210-03 and ISL-210-03B (Split) collected (3 Encore tubes, 1 4 oz jar for each) (4'-6')

1450 Soil sample ISL-210-04 collected (6'-8') (3 Encore tubes, 1 4oz jar). Soil boring location is 1 foot east of original hole. Moving to ISL-211 location.

1508 Setting up on ISL-211 location

1525 Soil sample ISL-211-01 collected (0'-2') (3 Encore tubes, 1 4 oz jar)

~~1615 All samples packed on ice in Cooler,~~ JWF 5/22/00

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J. W. Furlow 05/22/00

1540 Soil sample ISL-211-02 collected from 2'-4' (3 Encore tubes, 1 4oz jar).
1555 J. Furlow and B. Kristiansen going back to SAIC field office. We can do no more soil borings until we can get onto the Armstrong property for ISL-204 and ISL-205, hopefully tomorrow.
1625 All samples packed on ice in cooler, will be shipped tomorrow.
1630 B. Kristiansen off site for the day.
1645 J. Furlow off site for the day.

J. W. Furlow
5/24/00

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[signature] 05/23/00

May 23, 2000

Project: Completion of Soil Sampling at Allied Industrial Park

Field Personnel: Jim Furlow, Bruce Kristiansen

0720 J. Furlow, B. Kristiansen at SAIC field office, preparing to continue soil sampling.

0730 J. Furlow conducts daily Health & Safety tailgate briefing.

0737 PID calibrated to 100 PPm Isobutylene. PID operating normally.

0750 Called Carol Adams at Armstrong, no answer.

0817 contacted Carol Adams, going to Armstrong.

0825 J.F. and B.K. at Armstrong, meet with C. Adams.

0835 Sampling team at ISL-205 location.

0850 Begin hand auguring on ISL-205.

0900 Soil sample ISL-205-01 collected from 0'-2' (3 Encore tubes, 1 4 oz jar).

0925 Soil sample ISL-205-02 collected from 2'-4' (3 Encore tubes, 1 4 oz jar). Sample saturated with water at about 3.5' bgs. Soil sample ISL-205-02 B (split) also collected from 2'-4' (3 Encore tubes, 1 4 oz jar) (0925)

0955 Attempted to hand auger 4'-6' interval, but sediments would not stay in auger busket due to saturation. Abandoned efforts to sample deeper in this hole.

1030 Sampling team and Carol Adams at ISL-204 location.

1040 Begin hand augering on ISL-204.

1045 Soil sample ISL-204-01 collected (0'-2') (3 Encore tubes, 1 4 oz jar)

1110 Soil Sample ISL-204-02 collected (2'-4') (3 Encore tubes, 1 4 oz jar).

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J. W. Furlow 05/23/00

May 23, 2000 (continued)
1140 Soil sample ISL-204-03 collected from 4'-6' (3 Encore tubes 1 4 oz jar). Sampling at ISL-204 discontinued at depth of 6 feet due to shallow water table conditions of about 3.5 ft bgs.
1205 Soil sampling on Armstrong property completed. Taking Carol Adams back to her office. J. F and B.K. going to SAIC field office to prepare samples for shipping.
1420 All samples packed on ice in coolers for shipment to GEL and Accura.
1445 Two coolers (GEL, Accura) and one PID (Atlanta Instruments) delivered to Fed Ex for shipment, J. F. and B.K. off site.

J. W. Farlow
5/23/00

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J.W. Zulow 5/31/0000

May 31, 2000
Project: Allied Industrial Park/Armstrong
Ground Water Sampling by Direct Push Technology
Field Personnel: Jim Furlow
Subcontractor: Gregs In Situ; Ruperto Aguilar, Sean Smith
1105 J. Furlow at SAIC field office in Allied Industrial Park; gathering field supplies and sample containers.
1215 Gregg In Situ rig at SAIC field office
1220 J. Furlow conducts Pre-Entry Health and Safety Briefing for Gregs personnel.
1250 J. Furlow and Gregg In Situ rig at Armstrong gate. Carol Adams of Armstrong escorted all personnel and equipment through gate to sampling locations, then left to attend a meeting. Gregs crew setting up on location IGW-201.
1300 Gregg In Situ crew decoming push rods and sampling equipment on site. Decon water collected for storage at AIP.
1350 Begin lift push and dissipation tests at IGW-201 location.
1405 Conducting dissipation test at depth of 20 feet.
1420 Pushing to 25 feet bgs. Conducting dissipation test at 25 feet.
1427 Dissipation test shows water table at possible depth of approximately 20 feet bgs.
1430 Pushing to 30 feet. Conducting dissipation test at depth of 30 feet. Dissipation test confirms water at approximate depth of 20 feet bgs.
1435 Going deeper to try to determine depth to clay.
1446 Possible clay encountered at depth of 38 feet bgs. Printing out lift diagram/charts.

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J.W. Fowlow 5/3/00

May 31, 2000 (continued)

1452 Pulling rods out of hole.

1510 Talked to P. Albenesius, discussed sampling depth, etc. Decided to take first sample at depth of 23-24 feet, second sample about 10 feet deeper.

1515 Carol Adams back at site.

1520 Begin pushing rods to sampling depth on IGW-201.

1530 Carol Adams off site.

1556 Sampling tool pushed to depth of 24.41 feet bgs, retracted to 21.4' bgs; screen set at ~~24.4~~ JWF 24.41 feet, extends up to ~~21.4~~ JWF 21.41 feet.

1600 Rig moved approximately 2 feet to push rods to second sampling depth.

1622 Sampling tool pushed to depth of 33.96' below ground surface, retracted four feet. Sampling zone is approximately 30 to 34 feet bgs (exposed screen zone). Sampling tools will be left in ground overnight, samples collected tomorrow morning.

1635 Moving to location IGW-202, setting up. Gregg helper is grouting up hole from lift push.

1640 Hole grouted up, begin pushing sampling tool at IGW-202.

1650 Sampling tool pushed to depth of 21 feet bgs. Temporary piezometer (3/4" PVC) set in hole with screen set 16'-21' bgs (5-foot screen). Steel push rods removed from hole.

1708 Rig set up on IGW-203 location. Pushing sampling tool to depth of 12 feet below ground surface.

1711 Tool pushed to depth of 12.3 feet. Screen length is 4.5 feet. Sampling zone is 7.8 feet to 12.3 feet bgs.

1715 Moving to IGW-204 location. IGW-203 was a temporary piezometer installation, like IGW-202, screened at 7.8 - 12.3 feet bgs.

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J.W. Furlow 5/15/2000

May 31, 2000 (continued)

1725 Begin pushing sampling tool at IGW-204.

1727 Sampling tool pushed to depth of 11.15 feet. Screen length 5.0 feet. Temporary piezometer installed (3/4" ID PVC) with screen set at 6.15 to 11.15 feet bgs.

1740 J. Furlow and Gregg In Situ personnel off site for the day.

1750 J. Furlow at SAIC field office to complete documentation for the day.

1800 J. Furlow off site for the day.

J. W. Furlow 6/1/00

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JW Fulsw 6/1/00

June 1, 2000

Project: Allied Industrial Park/Armstrong

Groundwater Sampling by Direct Push Technology

Field Personnel: Jim Furlow

Subcontractor: Gregg In Situ; Ruperto Aguilar, Sean Smith

0655 J. Furlow at SAIC field office, packing up supplies for today's sampling.

0710 Gregg In Situ personnel on site.

0715 J. Furlow conducts Daily Tailgate Health and Safety briefing for Gregg personnel

0720 J. Furlow and Gregg personnel at Armstrong gate, picked up Carol Adams to observe sampling procedures.

0730 All personnel at IGW-204 location.

0745 Static water level at IGW-203 measured at 8.86' bgs.

0754 Static water level at IGW-202 measured at 15.20 feet bgs.

0802 Static water level at IGW-201 (Shallow) is 19.32 feet bgs.

0807 Static water level at IGW-201 (Deep) measured at 19.37' bgs.

0814 Temporary piezometer at IGW-204 was dry (bottom of screen was at 11' bgs). Gregg crew moved over and pushed sampling tool to depth of 13.12 feet. Screen zone is 10.12 to 13.12 feet bgs.

0825 Rinsate sample IGW-204-01C collected from D.I. water running through inside of decon'd bailer to be used for sampling IGW-204.

0830 Sampling tool at IGW-204 is dry. We will let it sit, maybe accumulate water while we sample other locations.

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J. W. Farlow 06/01/00

June 1, 2000 (Continued)

0834 Bailing on temporary piezometer IGW-203.

0840 IGW-203 bailed dry, recovering.

0850 Groundwater sample IGW-203-01 collected (3 40-ml. vials).

0855 Gregg grouting up IGW-203 hole. Bailing IGW-202 dry.

0903 IGW-202 bailed dry.

0910 Groundwater samples IGW-202-01 and IGW-202-01B (split) collected (3 40 ml. vials for each sample).

0915 Bailing IGW-201 (Shallow) dry. T.D 24.4'

0930 Groundwater sample IGW-201-01 collected (3 40 ml. vials) from shallow hole (24.4' deep)

0938 Bailing IGW-20~~2~~1 JDF (Deep) dry. T.D. 33.96'

0950 Groundwater sample IGW-201-02 collected from depth of 30'-34' bgs (Deep hole).

0955 Back to IGW-204 location. Sampling tool pushed to 13' bgs; dry, no water inside tool.

1003 Pushing sampling tool to depth of 16' bgs at IGW-204.

1028 Sampling tool dry at 16 feet. P. Albenesius says to move 50 feet south and try again.

1037 Gregg rig moved 50 feet south. Setting up to sample.

1041 Sampling tool pushed to depth of 10 feet at second IGW-204 location, retracted 3 feet. Sampling zone is 7.0 to 10.0 feet bgs.

1058 Sampling tool is dry; no water in IGW-204 second location hole.

1100 Carol Adams off site. Gregg crew grouting up IGW-204 hole.

1120 All holes grouted up to ground surface.

1137 All personnel leaving Armstrong plant.

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J.W. Farlow 6/1/00

June 1, 2000 (continued)

~~0834 Bailing on temporary piezometer IGW-203.~~ JWF 6/1/00

1145 Gregg rig and personnel depart site for Aiken, S.C.; J. Furlow to SAIC field office to pack samples in coolers. All samples presently on ice in cooler.

1400 All samples packed on ice in coolers. One cooler going to GEL, one to Accura (with IGW-202-01B (split) and trip blank.

1410 J. Furlow off site to Fed Ex offices.

1430 All samples delivered to Fed Ex for shipment to GEL and Accura. J. Furlow off site.

J. W. Furlow 6/1/00

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J. W. Furlow 6/5/2000

June 5, 2000
Project: Allied Industrial Park Monitoring Well Installation
Field Personnel: Jim Furlow
Subcontractor (Drilling): Alliance Environmental
Dave Wilcox, Wayne Smith, Bryan Giesecke

0955 J. Furlow at SAIC Field office in Allied Industrial Park. Discussed screen slot sizes and filter pack sand sizes with Phil Albenesius. Waiting for Alliance rig and crew to arrive.
1115 Alliance rig and crew on site.
1125 J. Furlow conducts Pre-Entry Health and Safety briefing for Alliance personnel.
1140 Moving drill rig and equipment to MW-62A location.
1150 Break for lunch
1235 Alliance crew setting up to decon rig and drill tools.
1345 Alliance crew deconning drill rig and tools.
1443 Rig and drill tool decon by hot pressure wash completed.
1445 Moving Alliance Rotosonic drill rig onto MW-62A location.
1457 Rig set up on MW-62A.
1505 J. Furlow and D. Wilcox conduct safety inspection of drill rig.
1510 Begin drilling on MW-62A by Rotosonic coring. See blue well installation book for core logs.
1515 Core run #1: 0'-6', recovered 4.0' (67%)
1527 Core run #2: 6'-16', recovered 9.0' (90%)
1540 Core run #3: 16'-26, recovered 10.0' (100%)

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J. W. Farlow 6/5/00

June 5, 2000 (continued)

1550 Core run #4: 26' - 36', recovered 9.0' (90%)

1600 Core run #5: 36' - 46', recovered 9.0' (90%)

1610 Core run #6: 46' - 56', recovered 8.5' (85%)

T.D. of boring 56.0' bgs. J. Furlow logging core while driller waits for Alliance truck with 20 slot screen and 1A filter sand.

1710 Alliance truck with screen and sand on site. All core logged and placed in 55-gallon drum.

1750 No well installed in MW-62A today because of approaching thunderstorm. Will install well tomorrow morning.

1800 All personnel off site for the day.

J.W. Furlow 6/5/00

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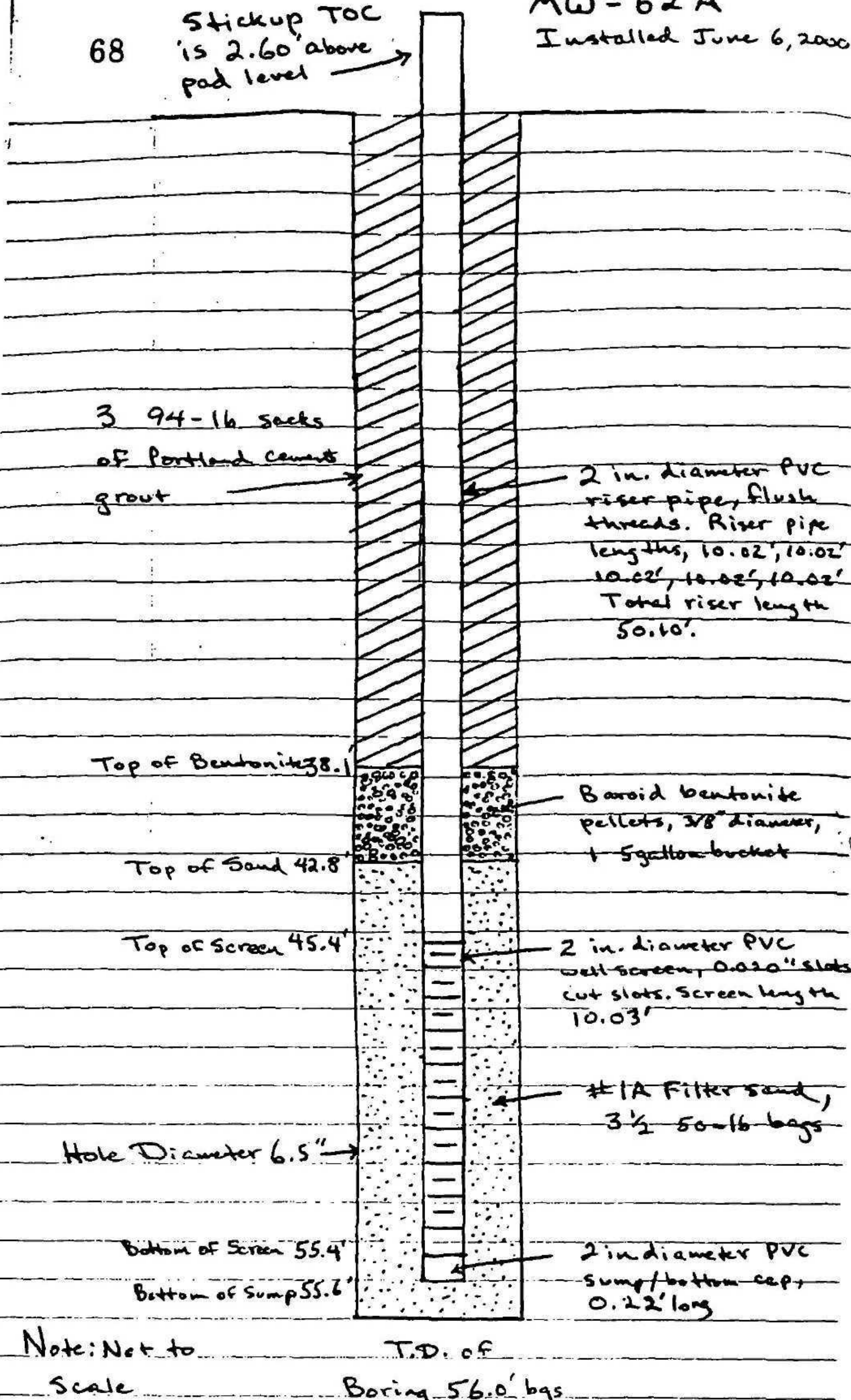
MW-62A
Installed June 6, 2000



Note: Not to Scale

June 6, 2000

Project: Allied Industrial Park Monitoring Well Installation

Field Personnel: Jim Furlow

Drilling Subcontractor: Alliance Environmental

Dave Wilcox, Wayne Smith, Bryan Giesecke

0650 J. Furlow at SAIC field office.

0654 Alliance crew at field office. J. Furlow conducts Tailgate Health and Safety briefing.

0705 All personnel at MW-62A location. Preparing to steam clean well screen and riser pipe.

0730 Screen and riser tally: Screen and sump length, 10.25' (screen ~~10.30~~ 10.03' JWF sump ~~.20~~ 0.22')

(0.020 slot, cut slots, 2" dia PVC, flush threaded joints). Riser pipe: 10.02', 10.02', 10.02', 10.02', 10.02' (2" dia PVC pipe, Flush threaded joints.

0735 Alliance crew steam cleaning sump, screen, and riser pipe.

0743 Bottom of hole tagged at 55.5' T.D. bgs. Begin installation of screen and riser pipe.

0745 Sump, screen and riser installed. One 50-lb sack of #1A filter sand installed. Pulling casing up.

0757 Top of sand tagged at 52.5' bgs. Adding second bag of 1A filter sand. Top of sand tagged at 46.1' bgs, but some sand is still inside temporary casing.

0805 Third bag of #1A sand added. Pulling casing up. Top of sand tagged at 43.7' bgs

0825 1/2 of fourth bag of 1A sand added. Top of sand tagged at 42.8' bgs.

Screen set at 45.4' to 55.4' bgs. Unable to move up.

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JW [illegible] 6/6/00

June 6, 2000 (continued)

0829 One 5 gal. bucket of Baroid 3/8" dia bentonite pellets added. Top of bentonite tagged at 38.1' bgs. Begin bentonite hydration period.

0950 Three 94-lb. bags of ~~[illegible]~~ portland cement mixed with 35 gallons of water, 1/4 25-lb sack of bentonite. Crew pumping cement grout into well annulus through tremie pipe.

0955 Pulling temporary well casing out of hole. Grout up to ground surface.

1015 Drill rig moved off well. Crew putting IDW in 55-gallon drums.

1026 IDW generated at MW-62A: 1 drum of soil, 2 drums of drilling fluid (muddy water).

1042 Going to decon pad to decon drilling fluid tub.

1055 Moving to MW-70A location.

1110 Setting rig up on MW-70A

1138 Break for lunch; rig ready to drill

1215 Getting 55-gal. drums out of storage.

1233 Ready to begin coring on MW-70A.

1235 Begin coring MW-70A location.

1245 Core run #1: 0'-6'; recovered 6.0' (100%)

1300 Core run #2: 6'-16', recovered 9.0' (90%)

1312 Core run #3: 16'-26', recovered 10.0' (100%)

1327 Core run #4: 26'-36', recovered 8.5' (85%)

1340 Core run #5: 36'-46', recovered 9.0' (90%)

1346 Core run #6: 46'-56', recovered 9.0' (90%)

1356 Core run #7: 56'-59', recovered 1.0' (33%)

Note: Core lithologic descriptions are in blue well installation log book.

1400 Coring completed, T.D. of boring 59.0' bgs.

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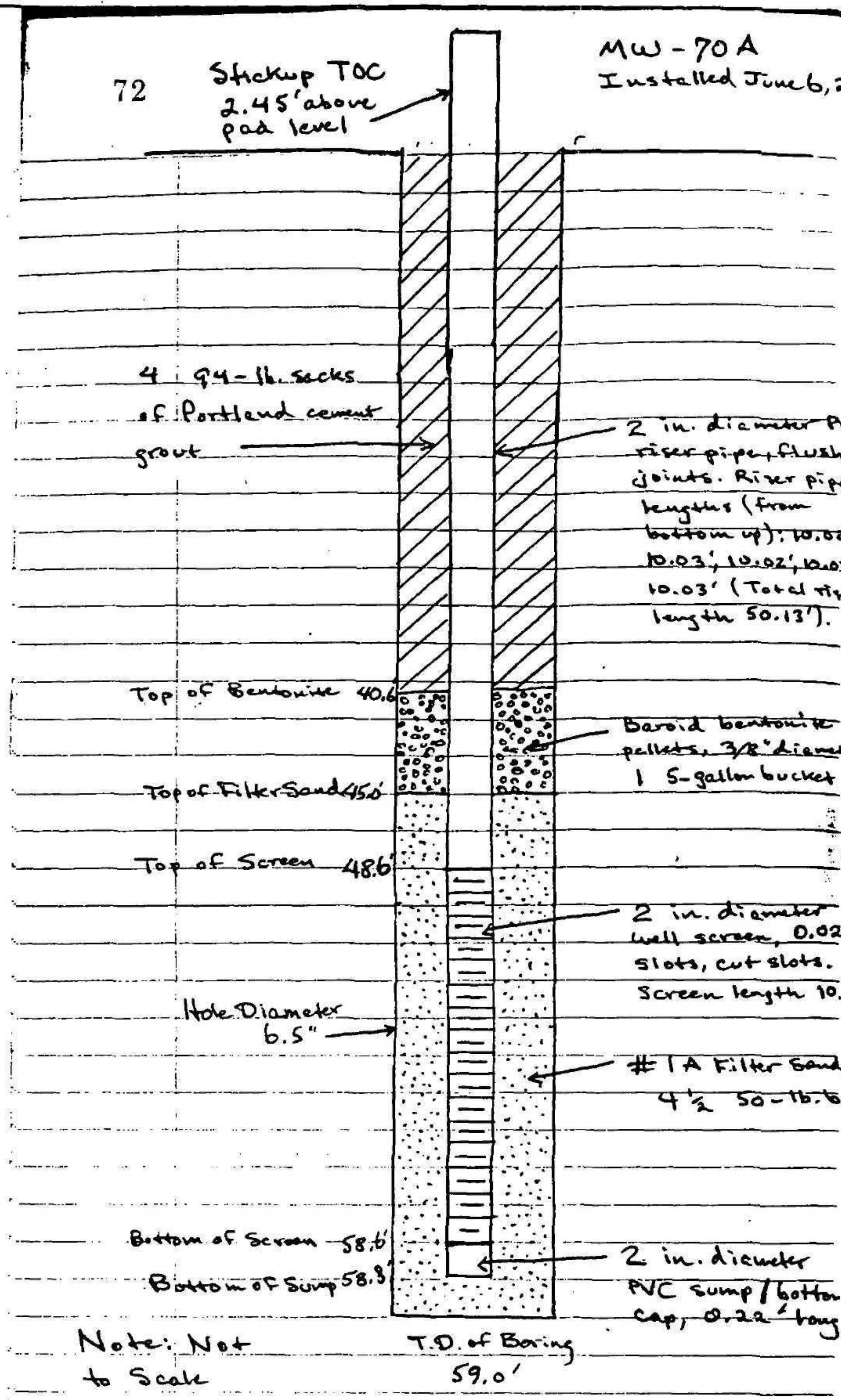

MW-70A
Installed June 6, 2
Stickup TOC
2.45' above
pad level
4 94-lb. sacks
of Portland cement
grout
2 in. diameter P
riser pipe, flush
joints. Riser pipe
lengths (from
bottom up); 10.02
10.03', 10.02', 10.0
10.03' (Total rip
length 50.13').
Top of Bentonite 40.6
Baroid bentonite
pellets, 3/8" diame
1 5-gallon bucket
Top of Filter Sand 45.0'
Top of Screen 48.6'
2 in. diameter
well screen, 0.02
slots, cut slots.
Screen length 10.
Hole Diameter
6.5"
#1A Filter Sand
4½ 50-lb. b
Bottom of Screen 58.6'
Bottom of Sump 58.8'
2 in. diameter
PVC sump/bottom
cap, 0.22' long
Note: Not
to Scale
T.D. of Boring
59.0'

June 6, 2000 (Continued)

1405 Sump, screen and riser pipe tally:
Sump/bottom cap length 0.22' (2" PVC); screen length 10.05' (2" dia. PVC, 0.020" slot, cut slots); riser pipe lengths: 10.02', 10.03', 10.02', 10.05', 10.03' (2" dia. PVC, flush joints) (total riser length 50.13')

1410 Begin installation of MW-70A; screen to be set at 48.0'-58.0' bgs.

1412 Sump, screen and riser pipe installed in well.

1413 One 50-lb. bag of #1A Filter sand installed. Top of sand tagged at 56.5' bgs.

1420 One 50-lb. bag of #1A sand installed. Top of sand tagged at 53.3' bgs.

1426 One 50-lb. bag of #1A sand installed. Top of sand tagged at 50.6' bgs.

1430 One 50-lb. bag of #1A sand installed. Top of sand tagged at 47.5' bgs.

1440 ½ 50-lb. bag of #1A sand installed. Top of filter sand tagged at 45.0' bgs. Screen set at 48.6'-58.6' bgs.

1450 One 5-gallon bucket of Baroid 3/8" bentonite pellets installed in well. Top of bentonite tagged at 40.6' bgs. Begin period of bentonite hydration. Crew going to pour pad at MW-62A.

1625 Alliance crew back at MW-70A, mixing cement grout.

1645 4 94-lb. sacks of Portland cement, 40 gal. water, ¼ 25-lb. sack of bentonite mixed and pumped into well annulus through tremie pipe. Crew flushing out pump and hoses.

1720 IDW Generated at MW-70A:
1 ¼ 55-gal. drums of soil (core), and

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J. W. Farlow 6/6/2000

June 6, 2000 (Continued)
two full 55-gal. drums of drilling fluid (muddy water).
1750 All IDW drums from MW-70 A carried to drum staging area and stored on concrete pad.
1800 Drill crew off site for the day. J. Furlow off site for the day.

J. W. Furlow
6/6/2000

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J.W. Fowler 6/7/2000

June 7, 2000

Project: Allied Industrial Park Monitoring Well Installation

Field Personnel: Jim Furlow

Drilling Subcontractor: Alliance Environmental

Dave Wilcox, Wayne Smith, Bryan Giesecke

0655 J. Furlow at SAIC field office

0710 Alliance crew on site - had been to rental store trying to rent a hand auger.

0715 J. Furlow conducts Tailgate Health and Safety briefing. Discussed work plans for today. Going to MW-62A to begin well development.

0730 At MW-62A. Concrete pad and protective steel housing were installed 6/6/2000. Top of casing is 2.60' above concrete pad. Static water level is 40.10' below TOC. Bottom of well tagged at JWF 58.~~7~~2' JWF below TOC. Bottom of well is at 55.72 ~~55.62~~ 55.62 JWF below pad level.

0745 Driller going to rent hand auger. Alliance helpers begin digging hole for pad at MW-70A.

0800 J. Furlow to Armstrong to check on grout settlement in CPT holes done previously.

0825 Five holes need additional grout. Carol Adams says for me to go in anytime and fill the holes.

0840 Back at MW-62A.

0855 Alliance crew at MW-62A to develop well.

0915 Begin development of MW-62A by bailing. Water is muddy, but contains little sediment.

0943 5 gallons of muddy water purged from MW-62A by bailing. Installing 12-volt Whaler pump in well to bottom of screen.

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J. W. Furlow 6/7/2000

June 7, 2000 (continued)

0950 Begin development of MW-62A by pumping with submersible Whaler pump.

1000 Whaler pump is pumping well at about 0.7 gpm.

1110 One 55-gallon drum filled with development water; starting on second drum.

1200 Second 55-gallon drum partially filled with 35 gallons of development water. Water is clearing up nicely. Development of MW-62A temporarily stopped in order to work on development of MW-70A. Static water level in MW-62A tagged at 40.40' below TOC 10 minutes after pumping stopped - nearly fully recovered.

1215 Bottom of well tagged at 58.30' below TOC; no sediment remaining in well. Bottom of well is at 55.7' below pad level, which is about 0.1'-0.2' above original ground level.

1300 Alliance crew has deconned Whaler pump and tubing, going to MW-70A.

1310 Alliance crew working on pad and post installation at MW-70A. J. Furlow going to Armstrong plant to grout up CPT holes to ground surface.

1435 All CPT holes on Armstrong property grouted up to ground surface with Portland cement grout. Called Carol Adams to tell her this has been done. Going to MW-70A.

1500 Alliance crew has poured pad on MW-70A and installed 2 of 4 posts.

1550 All posts installed on MW-70A.

1600 Alliance crew going to MW-62A to paint protective housing and posts.

1700 Housing and posts at MW-62A painted yellow. Going to MW-70A to begin development.

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W. J. Fulani 6/7/2000

JWF ~~July~~ June 7, 2000 (Continued)

1710 Begin developing MW-70A by bailing with decon'd stainless steel bailer. Riser pipe stickup is 2.85 feet above pad level. JWF

1740 5 gallons of muddy water and some sediment bailed from MW-70A. Development discontinued for the day. Bottom of well tagged at 61.11' below TOC. Recalculating measurements, screen is set at 48.6' to 58.6' ~~bgs~~ below top of pad. JWF Bottom of sump is at 58.8' ~~bgs~~ JWF below top of pad.

Note: this assumes there is no more sediment in well. This will be checked out tomorrow.

1815 Well MW-70A housing and posts all painted. Alliance crew going back to MW-62A to move some full drums.

1850 All full drums moved from MW-62A to staging area. Alliance crew and J. Furlow off site for the day.

J. W. Furlow 6/7/2000

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J.W. [illegible] 6/8/00

June 8, 2000

Project: Allied Industrial Park Monitoring Well Installation

Field Personnel: Jim Furlow

Drilling Subcontractor: Alliance Environmental

Dave Wilcox, Wayne Smith

0700 J. Furlow and Alliance crew at SAIC field office

0705 J. Furlow conducts daily Tailgate Health and Safety briefing.

0715 Driving posts in ground for barrier around drum storage area.

0723 All at MW-70A. Static water level measured at 33.86' below TOC.

0725 Resuming development of MW-70A by bailing.

0827 10 gallons of muddy water bailed from MW-70A. Bottom of well tagged at 61.18' below TOC. Crew installing Whale pump in well.

0835 Begin development of MW-70A by pumping with Whale pump. Pumping rate is 1 gpm.

0845 J. Furlow going to Fed Ex to pick up Horiba U-10 water quality meter.

0910 J.F. Back at MW-70A with Horiba U-10

0930 Horiba U-10 will not calibrate properly on pH. All other parameters calibrate.

Time	pH	Cond.	Turbidity	D.O.	Temp
0930	—	0.152	102	9.64	21.0°
0950	—	0.123	109	9.27	21.4°
1010	—	0.059	64	9.87	21.6°
1030	—	0.056	66	10.14	21.8°
1100	—	0.055	45	10.09	22.0°

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J. W. Furlow 6/8/00

June 8, 2000 (Continued)

Time	pH	Cond.	Turbidity	D.O.	Temp.
1120	—	0.055	28	10.94	21.7°
1140	—	0.054	26	10.67	21.9°
1155	—	0.055	22	10.08	21.8°

1155 Development of MW-70A completed. Total of 165 gallons removed from well. Bottom of well tagged at 61.22' below TOC.
1210 Static water level tagged at 33.85' below TOC. Moving to MW-62A to complete development. Crew going to decon whale pump and tubing.
1252 J. Furlow and Alliance crew at MW-62A to complete development of that well. Static water level in MW-62A tagged at 40.38' below TOC. Bottom of well tagged at 58.31' below TOC.
1257 Crew installing Whale pump in MW-62A
1300 Resumed development of MW-62A by pumping with Whale pump

Time	pH	Cond.	Turbidity	D.O.	Temp.
1305	—	0.071	100	11.98	23.2°
1320	—	0.065	156	11.13	22.0°
1340	—	0.064	128	11.00	22.1°
1400	—	0.061	207	11.05	22.1°
1420	—	0.060	31	11.07	22.0°
1440		0.059	4	11.~~59~~ 88 JWF	22.0°

1440 Development of MW-62A completed. Turbidity 4 NTU. Total of 165 gallons removed from well (3 55-gallon drums)
1448 Bottom of well tagged at 58.32'

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J. W. Farlow 6/8/00

June 8, 2000 (continued)

below TOC. Water level tape inoperative, unable to measure static water level again.

1515 All development water and other IDW drums transported to drum storage area on concrete pad. Storage area roped off. Drill crew deconning whole pump and tubing, loading equipment.

IDW Drum Tally:

MW-62A

1 drum of soil (cores)

2 drums of Rotosonic drilling fluid (muddy water)

3 drums of well development water (muddy to clear)

MW-70A

2 drums of soil (Cores)

3 drums of Rotosonic drilling fluid (muddy water)

3 drums of well development water (muddy to clear)

Note: In addition to the above, there are 2 drums of soil from the ISL hand auger borings and 1 drum of decon water, stored in the SAIC field office.

1545 Alliance Environmental crew off site for Aiken, S.C.

1550 J. Furlow off site to Atlanta.

J.W. Furlow 6/8/00

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J. W. Zwelow 6/12/00

June 12, 2000
Project: Allied Industrial Park Groundwater Sampling
Field Personnel: Jim Furlow, Andy Smits

0930 J. Furlow at Fed Ex to pick up sample containers. No containers at Fed Ex.
0950 Locate cooler of sample containers at Tom Yocum's office. Going to SAIC field office to gather sampling equipment.
1030 Andy Smits on site with additional sampling equipment.
1045 Calibrating Horiba U-10 Water quality meter. Andy Smits making up trip blanks for split samples going to Accura labs.
1110 Horiba U-10 would not calibrate on pH. All other values are calibrated. We will use Cole-Parmer pH meter (pH Tester 1 meter). Cole-Parmer pH meter calibrated to pH 4 solution.
1134 Sampling team at MW-70A.
Static water level at 33.86' below TOC.
1153 Begin purging MW-70A. 1 well vol. = 4.1 gal

Vol	Time	pH	Cond.	Turbidity	D.O.	Temp
1 gal	1155	5.4	0.096	8	10.77	23.2°
5 gal	1159	5.6	0.061	5	10.74	22.3°
10 gal	1203	5.6	0.058	1	10.73	21.9°
14 gal	1209	5.6	0.057	0	~~11.08~~ 10.77 JWF	21.9°
20 gal	1214	5.6	0.056	0	10.78	21.8°

1215 Total of 20 gallons purged from MW-70A.
1280 Groundwater samples MW-70A-01 and MW-70A-01B (split) collected (3 40-mL vials each). Bottom of well tagged at 61.22' below TOC.

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JW Zenker 6/14/2000

June 12, 2000

1250 Sampling team back at SAIC field office to decon Whale pump and tubing.

1308 Whale pump and tubing deconned.

1320 Sampling crew at MW-62A well location. Static water level in MW-62A is 40.41' below TOC.

1330 Begin purging MW-62A. One well volume equals 3 gallons.

Vol.	Time	pH	Cond	Turbid.	D.O.	Temp.
1 gal	1332	5.9	0.117	35	12.42	24.5°
4 gal	1336	5.7	0.064	33	12.15	23.0°
10 gal	1342	5.6	0.062	10	11.34	23.4°
13 gal	1346	5.6	0.061	7	11.39	23.0°
17 gal	1351	5.6	0.061	2	11.42	22.8°
20 gal	1354	5.6	0.060	2	11.44	22.8°

Total of 20 gal purged from MW-62A prior to sampling.

1410 Groundwater samples MW-62A-01 and MW-62A-01A (duplicate) collected from well MW-62A (3 40-ml vials each).

1414 Bottom of MW-62A tagged at 58.32' below TOC.

1420 Sampling crew going to SAIC field office to decon whale pump and wiring.

1434 Whale pump and wiring deconned. Going to MW-72.

1452 Sampling team at MW-72. Static water level 22.97' below TOC. T.D. of well 29.07' below TOC (from records). One well volume equals 0.134 ~~gal/ft~~ cu.ft; equals 1 gallon.

1506 Begin purging MW-72

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J. W. Fenton 6/12/2000

June 12, 2000

Vol.	Time	pH	Cond	Turbid.	D.O.	Temp
gal	1507	5.0	0.039	218	10.98	26.4°
[illegible] gal	1510	5.0	0.037	400	11.93	22.2°
[illegible] gal	1515	4.9	0.035	86	11.45	21.7°
8 gal	1518	4.9	0.035	40	11.42	21.5°
10 gal	1520	4.9	0.036	32	11.07	22.7°
12 gal	1522	4.8	0.035	65	~~10.37~~ JWF 11.47	21.3°
14 gal	1526	4.9	0.036	65	11.35	21.7°

1528 Total volume purged 16 gallons from MW-72.

1540 Groundwater sample MW-72-01 (3 40ml vials) collected from MW-72. Bottom of well tagged at 28.98' below TOC.

1609 Sampling team at SAIC with ice, samples. Preparing to pack coolers for shipping to ~~R~~ JWF. GEL and Accura Labs.

1650 Samples packed to ship to GEL:

MW-70A-01 1230

MW-62A-01 1410

MW-62A-01A 1410 (Duplicate)

MW-72-01 1540

TB-005 1230 Trip Blank

Samples packed to ship to Accura Labs:

MW-70A-01B (split) 1230

TB-005A 123 Trip Blank

1705 Andy Smits takes GEL and Accura coolers to Fed Ex for shipment.

1745 A. Smits and J. Furlow off site.

J. W. Furlow 6/12/2000

APPENDIX B
Geologic Logs Soil Borings

HTRW DRILLING LOG

DISTRICT

HOLE NO. ISL

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: Alliance Environmental

SHEET

3. PROJECT: AIP Soil Sampling

4. LOCATION

5. NAME OF DRILLER: Mike Coleman

6. MANUFACTURERS DESIGNATION OF DRILL: ~~JWE~~ CME Mobile B-61

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4¼" Hollow stem auger 8" OD; CME 4" OD, 3" ID continuous sampler

8. HOLE LOCATION: See SAIC Work Plan Figure 4A.10

9. SURFACE ELEVATION

10. DATE STARTED: 6/2/98

11. DATE COMPLETED: 6/2/98

12. OVERBURDEN THICKNESS

15. DEPTH GROUNDWATER ENCOUNTERED: ~~29'~~ 6/2/98 JWF 30.2

13. DEPTH DRILLED INTO ROCK

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

14. TOTAL DEPTH OF HOLE

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
3	✓ (3)					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Furlow

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT

HOLE NO.

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

6/2/98

HOLE NUMBER: ISL-125

PROJECT: Drill rig soil sampling | INSPECTOR: J.W. Forlow | SHEET: 1

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)
		0-2.5 Silty sand (SM) - dark red to brown, very fine grained, subangular; becomes dark brown at 2-2.3'	0-2.5 25 ppm		0-2.5' ISL-125-01	
		2.5'-4' Silty sand (SM) dark red, fine to med. grained, slightly clayey	2.5-4 51 ppm			
	5	4'-9' Silty sand (SM) - dark red, very fine to med. grained, gravel 1/4"-1 1/2" 4'-7', clayey, low plasticity, dry, loose to moderately well compacted	4-6.5 70 ppm 6.5-9 134 ppm		6.5'-9' ISL-125-02	
	10	9'-14' Silty sand (SM) - dark red, medium to coarse grained, subangular, gravel 1/4" at 8'-9.5', coarse gravel 1/4"-1" at 12', clayey, low plasticity, moist, moderately well compacted.	9-11.5 88 ppm 11.5-14 54 ppm			
	15	14'-19' Silty sand (SM) - very light grey, fine to medium grained, subangular, well compacted, dense, dry. Sand is micaceous, contains <5% kaolinitic clay.	14-16.5 27 ppm 16.5-19 64 ppm			
	20	19'-~~21.5~~ 24' Silty sand (SM) - very light gray, fine grained, subangular, well compacted, dense, ~~dry~~, micaceous (<5%) kaolinitic (<5%), laminated. Sand is slightly moist to dry.	19-21.5 39 ppm 21.5-24 48 ppm			
	25	24-26.5 Silty sand (SM) - as above, sand is slightly moist.	24-26.5 17 ppm			
		26.5-29 silty sand (SM) - as above, sand is slightly moist.	26.5-29 0 ppm			
	30	29'-34' Silty sand (SM) - very light gray, fine to medium grained, subangular, loose to poorly compacted, micaceous, slightly kaolinitic (<5%), laminated, wet.	29-31.5 0 ppm 31.5-34 0 ppm		29'-31.5' ISL-125-03	Approximate depth to water table is ~~29~~ 30.2' JWF. JWF 6/2/98
	35	T.D. 34' 6/2/98				
	40					
	45					
	50					

PROJECT | HOLE NO. ISL-125

HTRW DRILLING LOG	DISTRICT	HOLE NUMBER ISL-123
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR Alliance Environmental	SHEET 1 OF SHEETS

3. PROJECT AIP Soil Sampling/Drilling	4. LOCATION
5. NAME OF DRILLER Mike Coleman	6. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT Hollow stem auger, 4¼" ID, 8" OD, with CME continuous sampler, 4" OD, 3" ID.	8. HOLE LOCATION See SAIC Figure 4A.10
	9. SURFACE ELEVATION
	10. DATE STARTED 6/2/98 — 11. DATE COMPLETED 6/2/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED Dry hole
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
3	✓ (3)					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Furlow

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG 6/2/98

HOLE NUMBER: ISL-123

INSPECTOR: J.W. Furlow

SHEET: 1

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'-4' Silty Sand (SM) - light brown to dark red-brown, fine grained, dense, compacted, dry, slightly clayey (<10%)	0-2 0 ppm; 2-4 0 ppm		0'-2' ISL-123-01	1425
	5	4'-6' Silty Sand (SM) - dark brown, fine grained, dense, compacted, dry.	4-6.5 20 ppm			
		6'-9' Clayey sand (SC) - dark reddish-brown med. grained, very dense, highly compacted, hard, dry, with mottling.	6.5-9 171 ppm			
	10	9'-11.5' Silty Sand (SM) - dark red-brown, medium to coarse grained with occasional 1/4" gravel (<10%), dense, moderately compacted, dry	9-11.5 246 ppm		9'-11.5' ISL-123-02	
		11.5'-14' No recovery	11.5-14 NR			
	15	14'-16.5' Sand with gravel - (SW) - light to dark brown, fine to coarse grained sand, subangular, with abundant gravel (30-40%) 1/4"-1 1/2", loose to poorly compacted, dry	14-16.5 139 ppm			
		16.5'-19' No recovery	16.5-19 NR			
	20	19-24 Silty sand (SM) - very light gray, fine to medium grained, subangular, dense, compacted, micaceous (<3%) Kaolinitic (<5%) laminated, dry.	19-21.5 212 ppm; 21.5-24 172 ppm			
	25	24'-26' Silty Sand (SM) - as above, moist	24-26.5 134 ppm		24'-26.5' ISL-123-03	
		26'-29' Clay (CL) - light gray, hard, dense, highly compacted, dry. Clay is kaolinite.	26.5-29' 85 ppm			
	30	T.D. 29' 6/2/98				Bottom of Hole is dry; no water.
	35					
	40					
	45					

PROJECT

HOLE NO. ISL-123

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER ISL-122
1. COMPANY NAME	2. DRILL SUBCONTRACTOR Alliance Environmental	SHEET OF SHEETS
3. PROJECT AIP Soil Sampling	4. LOCATION	
5. NAME OF DRILLER Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT Hollow stem augers, 4.25" ID, 8" OD; split spoons	8. HOLE LOCATION See SAIC Figure 4A.10	
	9. SURFACE ELEVATION	
	10. DATE STARTED 6/3/98	11. DATE COMPLETED 6/3/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	**VOC**	**METALS**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**21. TOTAL CORE RECOVERY %**
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR** J. W. Furlow		

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

8

HTRW DRILLING LOG

HOLE NUMBER: ISL-122

INSPECTOR:

SHEET:

PROJECT:

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'-4' Clayey sand (SC) - moderate reddish brown (10R4/6), stiff, fine grained, low plasticity, dry, friable	0-2.5 453 ppm		ISL-122-01 0'-2.5'	1015 AM
	5	4'-6' Clayey sand (SC) - moderate reddish brown (10R4/6) stiff, low plasticity, fine grained	4-6 18 ppm			
		6'-8' Sandy Clay (CL) - moderate reddish brown (10R 4/6), fine grained, stiff, hard, low plasticity, dry	6-8 0 ppm			
		8'-10' Sandy Clay (CL) - moderate reddish brown (10R4/6), fine grained, stiff, hard, low plasticity, dry	8-10 0 ppm			
	10	10'-12' Sandy Clay (CL) - as above, dry	10-12 0 ppm			
		12-14 Silty sand (SM) - Light brown (5YR 5/6), med. to coarse grained, subangular, gravel to 1/4" - 1/2"	12-14 0 ppm			
	15	14-16 Silty clay (CL) - dark yellowish orange (10YR 6/6), dense, stiff, medium plasticity, dry.	14-16 0 ppm			
		16'-18' Sand (SW) - Pale yellowish orange (10YR 8/6), fine to medium grained, subangular, slightly silty, loose, dry.	16-18 0 ppm			
		18-20' Sand (SW) - Dark yellowish orange (10YR 6/6), fine-grained, subangular, slightly silty, loose, dry.	18-20 0 ppm			
	20	20'-22' Sand with gravel (GP) - dark yellowish orange (10YR 6/6), med to coarse grained, subangular, gravel 1/4 - 1 1/2", dry.	20-22 16 ppm		ISL-122-02 20'-22'	1230 pm
		22'-24' Sand with gravel (GP) - dark yellowish orange (10YR 6/6), fine to coarse grained, subangular, gravel sizes 1/4" - 1 1/2", dry.	22-24 0 ppm			
	25	24-26 Sand with gravel (GP) as above	24-26 0 ppm			
		26'-28' Sand (SP) - dark yellowish orange ((10YR 6/6), medium grained, subangular, slightly silty, dry.	26-28 0 ppm			
		28'-30' Clayey sand (SC) - very light gray (N8), medium grained, subangular, soft, micaceous, kaolinitic	28-30 0 ppm			
	30	30'-32' Silty clay (CL) - very light gray (N8), stiff, medium plasticity, micaceous, kaolinitic, dry	30-32 0 ppm			
		32'-33' Silty clay (CL) as above; 33-34' Silty sand (SM) - very light gray (N8), med. grained, silty, dry	32-34 0 ppm			
	35	34'-36' Silty sand (SM) - very light gray (N8), very fine grained, soft, loose, kaolinitic, moist.	34-36 0 ppm			
		36'-38' Clayey sand (SC) - very light gray (N8), very fine grained, subangular, silty, micaceous, dry	36-38 0 ppm			
		38'-40' Silty sand (SM) - very light gray (N8), fine grained, subangular, slightly micaceous, dry	38-40 0 ppm			
	40	40'-42' Sand (SW) - grayish yellow (5Y 8/4), fine to coarse grained, subangular, slightly silty, compacted, damp.	40-42 0 ppm		ISL-122-03 40'-42' 1430	Water Level at 41.5' bls 1500 6/3/98
		42'-44' Clay (CL) - yellowish gray (5Y 7/2), stiff, dense, medium plasticity, dry.	42-44' N/A			
	45	T.D. 44' 6/3/98				
	50					

PROJECT: | HOLE NO. ISL-122

HTRW DRILLING LOG

HTRW DRILLING LOG	DISTRICT	HOLE NUMBER ISL-121
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR Alliance	SHEET SHEETS OF
3. PROJECT AIP Soil Sampling	4. LOCATION	
5. NAME OF DRILLER Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION ISL-121; See SAIC Figure 4A.10	
	9. SURFACE ELEVATION	
	10. DATE STARTED 6/4/98	11. DATE COMPLETED 6/4/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED 37.7' bls	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	**VOC**	**METALS**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**21. TOTAL CORE RECOVERY %**
	✓ (5)					
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR**		
				J.W. Furlow		

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-121

INSPECTOR

SHEET

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	0-2 Silty sand (SM) - Moderate reddish brown (10R4/6), fine grained, compacted, dry	0-2 87 ppm		0-2' ISL-121-01	0750
		2-4 Clayey sand (SC) - moderate reddish brown (10R 4/6), fine to medium grained, subrounded, silty, dry	2-4 36 ppm			
	5	4-6 Sandy clay (CL) - moderate reddish brown (10R 4/6), stiff, dense, low plasticity, dry.	4-6 24 ppm			
		6-8 Sandy clay (CL) - as above. Sand is fine to med. grained, subangular. Dry.	6-8 24 ppm			
		8-9 Sandy clay (CL) as above	8-10 0 ppm			
	10	9-11 Sand with Gravel (GP) - dark yellowish orange (10YR6/6) medium to coarse grained, subangular, gravel 1/4"-1 1/2", dry, loose				
		11-12 Silty sand (SM) - light brown (5YR5/6), fine grained, subangular, loose, dry, some small gravel to 1/4"	10-12 0 ppm			
		12-14 Silty sand (SM) - as above	12-14 0 ppm			
	15	14-16 Silty sand (SM) - light brown (5YR5/6) - medium grained, subangular, loose, dry, some gravel to 1/4"	14-16 0 ppm			
		16-18 Sand with gravel (GP) - dark yellowish orange (10YR6/6), medium to coarse grained, subangular, with 1/4"-1" gravel	16-18 0 ppm			
		18-20 Sand with gravel (GP) - as above	18-20 4 ppm			
	20	20-22 Silty sand (SM) - light brown (5YR 6/4), fine to med. grained, loose, slightly damp	20-22 12 ppm		20-22' ISL-121-02	0950
		22-24 Silty sand (SM) - white (N9), fine to medium grained, subangular, micaceous, kaolinitic, dry	22-24 4 ppm			
		24-25 Silty sand (SM) - as above				
	25	25-26 Silty clay (CL) - pinkish gray (5YR 8/1), firm, medium plasticity, micaceous, dry	24-26 5 ppm			
		26-28 Sandy clay (CL) - yellowish gray (5Y 8/1), firm, medium plasticity, very fine grained sand, micaceous, dry	26-28 1 ppm			
		28-30 Silty Sand (SM) - white (N9), fine grained, subangular, micaceous, kaolinitic, dry	28-30 0 ppm			
	30	30-32 Silty sand (SM) - as above, slightly damp	30-32 0 ppm			
		32-33 Silty sand (SM) as above				
		33-34 Sand (SW) - very pale orange (10YR 8/2), med. to coarse grained, subangular, loose, micaceous, dry	32-34 0 ppm			
	35	34-36 Sand (SW) - white (N9), very fine to fine grained, subangular, micaceous, trace silt, slightly damp	34-36 0 ppm		36-38'	
		36-38 Silty sand (SM) - white (N9), very fine to fine grained, subangular, firm, kaolinitic, damp.	36-38 0 ppm		ISL-121-03 ISL-121-03-D ISL-121-03 A	1100 6/4/98
		38-39 Silty sand (SM) - as above	38-40 0 ppm			
	40	39-40 Clay (CL) - yellowish gray (5Y 8/1), stiff, medium plasticity, damp.				Water Level at 37.7' bls
		T.D. 40' 6/4/98				
	45					
	50					

PROJECT

HOLE NO. ISL-121

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER ISL-126
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR Alliance Environmental	SHEET SHEETS OF

3. PROJECT AIP Soil Sampling	4. LOCATION
5. NAME OF DRILLER	6. MANUFACTURERS DESIGNATION OF DRILL Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT Hollow stem auger, 2¼" ID, 6" OD, standard split spoons	8. HOLE LOCATION See SAIC Work Plan Figure 4A.10
	9. SURFACE ELEVATION
	10. DATE STARTED 6/4/98 — 11. DATE COMPLETED 6/4/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR J. W. Furlow		

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-126

INSPECTOR: J.W. Furlow

SHEET:

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) 6/4/98
	0	0-2 Silty sand (SM)-dark yellowish orange (10YR 6/6), very fine grained, subangular, compacted, dry	0-2 135 ppm		0-2 ISL-126-01 (VOA and SVOC) ISL-126-01A ISL-126-01D	1210 pm
		2-4 Silty sand (SM)-dark yellowish orange (10YR 6/6), very fine grained, dense, compacted, dry	2-4 40 ppm			
	5	4-6 Sandy clay (CL)-moderate reddish brown (10R 4/6), hard, dense, low plasticity, compacted, dry	4-6 0 ppm			
		6-8 Sandy clay (CL)-as above, laminated, dry, low plasticity	6-8 5 ppm			
		8-10 Sandy clay (CL)-light brown (5YR 5/6), hard, dense, highly compacted, laminated, dry	8-10 7 ppm			
	10	10-12 Sandy clay (CL)-light brown (5YR 5/6), stiff, medium plasticity, mottled, dry	10-12 22 ppm		10-12 ISL-126-02	1420
		12-14 Clayey sand with gravel (GC) moderate reddish brown (10R 4/6) medium grained, subangular, with 1/4"-1" gravel, loose, dry	12-14 0 ppm			
	15	14-16 Silty sand with gravel (GM)-dark yellowish orange (10YR 6/6) medium to coarse grained, gravel 1/4"-1"	14-16 0 ppm			
		16-18 Silty sand with gravel (GM) dark yellowish orange (10YR 6/6) fine grained, dry, gravel 1/4"-3/4"	16-18 0 ppm			
		18-20 Sand with gravel (GC)-dark yellowish orange (10YR 6/6) fine to med. grained, subangular, some silt and kaolinitic clay, dry	18-20 0 ppm			
	20	20-22 Clayey sand (SC)-white (N9), fine-grained, subangular, silty, soft, kaolinitic, micaceous, dry	20-22 0 ppm			
		22-24 Clayey sand (SC)-as above, medium grained, dry	22-24 0 ppm			
	25	24-26 Clayey sand (SC)-as above, damp	24-26 0 ppm			
		26-28 Sandy clay (CL)-grayish pink (5R 8/2), stiff, dense, medium plasticity, micaceous, damp	26-28 0 ppm			
		28-30 Silty sand (SM)-white (N9), fine grained, subangular, soft, well compacted, micaceous, dry	28-30 0 ppm			
	30	30-32 Silty sand (SM)-as above, kaolinitic, dry	30-32 0 ppm			
		32-34 Silty sand (SM)-white (N9) fine grained, subangular, soft, micaceous, kaolinitic, dry	32-34 0 ppm			
	35	34-36 Silty sand (SM)-pale yellowish orange (10YR 8/6), medium grained, subangular, ~~wet~~ damp	34-36 0 ppm		34-36 ISL-126-03	1610
		36-38 Silty sand (SM)-white (N9), fine grained, subangular, micaceous, slightly kaolinitic, wet	36-38 0 ppm			
	40	T.D. 38' 6/4/98				
	45					

PROJECT:

HOLE NO.: ISL-126

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER: ISL-117
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Alliance Environmental	SHEET / SHEETS OF
3. PROJECT: AIP Soil Sampling	4. LOCATION:	
5. NAME OF DRILLER: Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION: See SAIC Work Plan Figure 4A.10	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 6/5/98	11. DATE COMPLETED: 6/5/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED: 7.8' bls	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Furlow

LOCATION SKETCH/COMMENTS | SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-117

INSPECTOR: J. W. Furlow

SHEET:

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'-2' Sandy Clay (CL) - dark yellowish orange (10YR6/6), hard, silty, low plasticity, dry	0-2 27 ppm		0'-2' ISL-117-01 ISL-117-01-A	0845
		2-4 Organic silty clay (~~OH~~) (OL) dusky brown (5YR 2/2), soft, low plasticity, dry to damp	2-4 37 ppm			
		4-6 Organic clay (OH) - olive black (5Y 2/1), very soft, medium plasticity, wet	4-6 43 ppm		4'-6' ISL-117-02	0855
	5	6-8 Silty sand (SM) - moderate yellowish brown (10YR5/4), fine to medium grained, subangular, wet	6-8 40 ppm		ISL-117-03 6'-8'	0905 Water level at 7.8' bls
		8-10 Sandy clay (SC) - medium gray (N5) - soft to loose, medium plasticity, wet	8-10 4079 ppm			
	10	10-12 Silty sand (SM) - light brownish gray (5YR 6/1), fine to medium grained, subrounded, wet	10-12 1253 ppm			
	15	T.D. 12'				
	20					
	25					
	30					
	35					
	40					
	45					

PROJECT:

HOLE NO. ISL-117

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER: ISL-115
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Alliance Environmental	SHEET OF SHEETS
3. PROJECT: AIP Soil Sampling	4. LOCATION	
5. NAME OF DRILLER: Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 6/8/98	11. DATE COMPLETED: 6/8/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 17.5' / 10 min.	
14. TOTAL DEPTH OF HOLE: 20'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	✓					
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
				J. W. [signature]		

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

20

HTRW DRILLING LOG

HOLE NUMBER ISL-115

INSPECTOR

SHEET

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) 6/8/98
		0-2 Sand (SP) - Pale yellowish brown (10YR 6/2), fine grained, clean, loose, dry	0-2 135 ppm		ISL-115-01 ISL-115-01-D ISL-115-01-A	0-2 0820
		2-4 Sand (SP) - Pale yellowish brown (10YR 6/2), very fine to fine grained, subangular, loose, dry	2-4 140 ppm			
	5	4-6 Silty Sand (SM) - light brown (5YR 6/4), fine to coarse grained, subangular, dry, loose	4-6 6 ppm			
		6-8 Silty sand (SM) - light brown (5YR 5/6), fine grained, subangular, slightly clayey, damp	6-8 10 ppm			
		8-10 Silty sand (SM) - light brown (5YR 5/6), fine grained, subangular, slightly clayey, damp	8-10 15 ppm		8'-10' ISL-115-02	8'-10' 0859
	10	10-12 Clayey Sand (SC) - light brown (5YR 5/6), medium grained, subangular, micaceous, loose, damp	10-12 6 ppm			
		12-14 Silty Sand (SW) - light brown (5YR 5/6), medium to coarse grained, subangular, loose, damp	12-14 8 ppm			
	15	14-16 Silty sand (SP) - pale yellowish orange (10YR 8/6), very fine grained, subrounded, loose, damp	14-16 9 ppm			
		16-18 Clayey sand (SC) - dark yellowish orange (10YR 6/6), subangular, loose, wet	16-18 4 ppm		16-18 ISL-115-03 0925	Water level at 17.5' 0935 6/8/98
	20	18-20 Clayey sand (SC) - very pale orange (10YR 8/2), very fine grained, subrounded, micaceous, kaolinitic, soft, wet	18-20 6 ppm			
		T.D. 20' 6/8/98				
	25					
	30					

PROJECT

HOLE NO. ISL-115

HTRW DRILLING LOG

DISTRICT	
HOLE NUMBER	ISL-116
1. COMPANY NAME	SAIC
2. DRILL SUBCONTRACTOR	Alliance Environmental
SHEET / SHEETS	OF
3. PROJECT	AIP Soil sampling
4. LOCATION	
5. NAME OF DRILLER	Mike Coleman
6. MANUFACTURER'S DESIGNATION OF DRILL	Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	
8. HOLE LOCATION	
9. SURFACE ELEVATION	
10. DATE STARTED	6/8/98
11. DATE COMPLETED	6/8/98
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	28.0' 10 min
14. TOTAL DEPTH OF HOLE	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	✓					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Furlow

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-116

INSPECTOR:

SHEET:

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) 6/8/98
		0-2 Sand (SP) - dark yellowish brown (10YR 4/2), fine grained, subangular, loose, dry	0-2 0 ppm		ISL-116-01 ISL-116-01A ISL-116-01D	0'-2' (1056)
		2-4 Sand (SP) - dark yellowish orange (10YR 6/6), fine grained, subangular, loose, dry	2-4 2 ppm			
	5	4-6 Silty sand (SP) - dark yellowish orange (10YR 6/6), fine grained, subangular, loose, dry	4-6 2 ppm			
		6-8 Silty sand (SP) - light brown (5YR 5/6), subangular, slightly clayey, soft, damp	6-8 3 ppm		6-8 ISL-116-02 (1112)	
	10	8-10 Clayey sand (SC) - light brown (5YR 5/6), fine to medium grained, grading to clay at 9-10'	8-10 2 ppm			
		10-12 Clayey sand (SC) - light brown (5YR 5/6), fine to medium grained, subangular, with gravel 1/4"-1½"	10-12 0 ppm			
		12-14 Silty sand (SP) - very pale orange (10YR 8/2), fine grained, subangular, micaceous, soft, damp	12-14 0 ppm			
	15	14-16 Silty sand (SP) - very pale orange (10YR 8/2), very fine grained, subangular, micaceous, soft, damp	14-16 0 ppm			
		16-18 Silty sand (SP) - very pale orange (10YR 8/2), very fine grained, subangular, micaceous, soft, damp	16-18 0 ppm			
	20	18-20 Silty sand (SP) - pale yellowish orange (10YR 8/6), very fine grained, subangular, micaceous, damp	18-20 0 ppm			
		20-22 Silty sand (SP) - pale yellowish orange (10YR 8/6), very fine grained, micaceous, soft, damp	20-22 0 ppm			
		22-24 Silty sand (SP) - very light gray (N8), fine grained, micaceous, slightly kaolinitic, loose, damp	22-24 0 ppm			
	25	24-26 Silty sand as above to 25' then sandy clay (CL) 25-26, very light gray (N8), micaceous, stiff, wet	24-26 0 ppm		26'-28'	Water level at 28.0' bls 1230 6/8/98
		26-28 Silty sand (SP) - very pale orange (10YR 8/2), fine grained, micaceous, kaolinitic, damp	26-28 0 ppm		ISL-116-03 (1220)	
	30	28-30 Silty sand (SP) - very pale orange (10YR 8/2), very fine grained, slightly kaolinitic, wet	28-30 16 ppm			
		T.D. 30' 6/8/98				
	35					
	40					

PROJECT:

HOLE NO. ISL-116

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER: ISL-110
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Alliance Environmental	SHEET OF SHEETS
3. PROJECT: AIP Soil Sampling	4. LOCATION	
5. NAME OF DRILLER: Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 6/8/98	11. DATE COMPLETED: 6/8/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	✓					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Fuller

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-110

INSPECTOR:

SHEET: 6/8/98

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	0-2 Clayey sand (SC) - moderate yellowish brown (10YR 5/4), very fine grained, silty, dry	0-2 23 ppm		0-2' ISL-110-01 ISL-110-01-D	(1408)
		2-4 Clayey sand (SC) - moderate yellowish brown (10YR 5/4) very fine grained, silty, dry	2-4 4 ppm			
	5	4-6 Sandy clay (CL) - moderate reddish brown (10R4/6) stiff, dense, low plasticity, dry	4-6 2 ppm			
		6-8 Sandy clay (CL) - very light gray (N8) to moderate reddish brown (10R4/6), stiff, low plasticity, dry	6-8 0 ppm			
	10	8-10 Sandy clay (CL) - very light gray (N8) to moderate reddish brown (10R4/6), stiff, low plasticity, dry	8-10 0 ppm			
		10-12 Sandy clay (CL) - light brown (5YR 5/6), stiff, dense, low plasticity, dry	10-12 5 ppm			
		12-14 Sandy clay (CL) - light brown (5YR 5/6) to very light gray (N8), stiff, dense, low plasticity, dry	12-14 24 ppm			
	15	14-16 Clayey sand (SC) - moderate reddish brown (10R4/6), fine grained, silty, subangular, dry	14-16 40 ppm		14-16 ISL-110-02	(1437)
		16-18 Clayey sand (SC) - moderate reddish brown (10R4/6), fine grained, with 1/4"-1 1/2" gravel, dry	16-18 4 ppm			
	20	18-20 Silty sand (SM) - light brown (5YR 5/6), very fine grained subangular, micaceous, soft, damp	18-20 4 ppm			
		20-22 Clayey sand (SC) - light brown (5YR 6/4), very fine grained, micaceous, soft, silty, damp	20-22 0 ppm			
		22-24 Silty sand (SM) - light brown (5YR 5/6), very fine to fine grained, subangular, micaceous, damp	22-24 7 ppm			
	25	24-26 Silty sand (SM) - very pale orange (10YR 8/2), very fine grained, subangular, micaceous, damp	24-26 3 ppm			
		26-28 Silty sand (SM) - very light gray (N8), medium to coarse grained with some 1/4" gravel	26-28 14 ppm			
		28-30 Silty sand (SM) - Pinkish gray (5YR 8/1), medium grained, angular, micaceous, damp	28-30 5 ppm			
	30	30-32 Silty sand (SM) white (N9), fine to medium grained, subangular, micaceous, kaolinitic	30-32 2 ppm			
		32-34 Clayey sand (SC) - very light gray (N8), medium grained, micaceous, kaolinitic, soft, damp	32-34 15 ppm			
	35	34-36 Clayey sand (SC) - pinkish gray (5YR 8/1), very fine grained silty, micaceous, kaolinitic, damp	34-36 7 ppm			
		36-38 Clayey sand (SC) pinkish gray (5YR 8/1), fine grained, subrounded, micaceous, soft, wet	36-38 10 ppm		36-38' ISL-110-03	(1545)
	40	38-40 Silty sand (SM) - white (N9), very fine grained, subrounded micaceous, soft, loose, wet	38-40 0 ppm			Water level at 39.1' bls 6/8/98 1615
		40-42 Silty sand (SM) - white (N9), very fine grained, subrounded micaceous, soft, wet	40-42 0 ppm			
	45	T.D. 42' 6/8/98				

PROJECT:

HOLE NO. ISL-110

HTRW DRILLING LOG	DISTRICT	HOLE NUMBER ISL-109
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR Alliance Environmental	SHEET OF SHEETS

3. PROJECT AIP Soil Sampling	4. LOCATION
5. NAME OF DRILLER Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION
	9. SURFACE ELEVATION
	10. DATE STARTED 6/9/98 — 11. DATE COMPLETED 6/9/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
14. TOTAL DEPTH OF HOLE 40'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-109

PROJECT:

INSPECTOR:

SHEET:

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) 6/9/98
	0	0-2 Silty Sand (SM) - dark yellowish orange (10YR 6/6), very fine grained, slightly clayey, dry	0-2 77 ppm		0-2 ISL-109-01	(0755)
		2-4 Silty Sand (SM) - dark yellowish orange (10YR 6/6), very fine grained, subangular, dry	2-4 19 ppm			
		4-6 Sandy Clay (CL) - grayish orange (10YR 7/4), stiff, dense, low plasticity, mottled, dry	4-6 12 ppm			
	5	6-8 Sandy clay (CL) as above to 7', then Clayey Sand (SC) - moderate reddish brown (10R 4/6), dry	6-8 31 ppm			
		8-10 Clayey sand (SC) - moderate reddish brown (10R 4/6), fine grained, subangular, silty, soft, dry	8-10 16 ppm			
	10	10-12 Silty Sand (SM) - moderate reddish brown (10R 4/6), medium grained, slightly clayey, soft, dry	10-12 18 ppm			
		12-14 Silty Sand (SM) - moderate reddish ~~pale~~ orange (10R 6/6), fine to medium grained, with some gravel to 1"	12-14 27 ppm			
	15	14-16 Silty Sand (SM) as above to 15', then silty sand (SM) - white (N9), fine grained, micaceous, dry	14-16 30 ppm			
		16-18 Silty Sand (SM) - very pale orange (10YR 8/2), very fine grained, micaceous, soft, dry	16-18 21 ppm			
		18-20 Clayey Sand (SC) - moderate orange pink (10R 7/4), medium to coarse grained, subangular, dry	18-20 22 ppm			
	20	20-22 Silty Sand (SM) - moderate orange pink (10R 7/4), medium grained, subangular, soft, dry	20-22 21 ppm			
		22-24 Silty Sand (SM) - moderate orange pink (10R 7/4), medium grained, subangular, soft, dry	22-24 51 ppm			
	25	24-26 Silty Sand (SM) - very light gray (N8), subangular, slightly clayey, micaceous, soft, damp	24-26 74 ppm		24'-26' ISL-109-02	(0918)
		26-28 Sand (SP) - white (N9) fine grained, subangular, slightly silty, micaceous, soft, damp	26-28 25 ppm			
		28-30 Silty Sand (SM) - very light gray (N8), fine to medium grained, subangular, soft, damp	28-30 16 ppm			
	30	30-32 Sandy clay (CL) - very light gray (N8), stiff, dense, medium plasticity, dry	30-32 12 ppm			
		32-34 Clayey Sand (SC) - grayish pink (5R 8/2), very fine grained, subangular, silty, damp	32-34 15 ppm			
	35	34-36 Silty Sand (SM) - grayish pink (5R 8/2), very fine grained, subangular, micaceous, soft, damp	34-36 0.3 ppm			
		36-38 Clayey Sand (SC) - white (N9), fine grained, subangular, micaceous, kaolinitic, soft, damp	36-38 3 ppm		36-38 ISL-109-03	(1015)
	40	38-40 Clayey Sand (SC) - white (N9), fine to medium grained, subrounded, micaceous, wet	38-40 2 ppm			Water level at 38.5' bls 1030 6/9/98
		T.D. 40' 6/9/98 1020				
	45					

PROJECT:

HOLE NO. ISL-109

HTRW DRILLING LOG	DISTRICT	HOLE NUMBER ISL-111
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR Alliance Environmental	SHEET SHEETS OF

3. PROJECT AIP Soil Sampling	4. LOCATION
5. NAME OF DRILLER Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION
	9. SURFACE ELEVATION
	10. DATE STARTED 6/9/98 — 11. DATE COMPLETED 6/9/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR J. W. Furlow		

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO.

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER ISL-111

INSPECTOR

SHEET

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	0-2 Silty Sand (SM) - moderate brown (5YR 3/4), very fine grained, subangular, clayey, firm, dry	0-2 0 ppm		ISL-111-01 0-2	(1150)
		2-4 Silty Sand (SM) - moderate brown (5YR 3/4), very fine grained, subangular, soft, dry	2-4 6 ppm			
	5	4-6 Sandy Clay (CL) - light brown (5YR 5/6), low plasticity, soft, friable, dry	4-6 6 ppm			
		6-8 Sandy clay (CL) - light brown (5YR 5/6), low plasticity, firm, dense, dry	6-8 6 ppm			
		8-10 Clayey Sand (SC) - light brown (5YR 5/6), very fine grained, silty, soft, dry	8-10 4 ppm			
	10	10-12 Clayey Sand (SC) - light brown (5YR 5/6), very fine to fine grained, firm, dry	10-12 11 ppm			
		12-14 Clayey Sand (SC) - light brown (5YR 5/6), fine grained, subangular, silty, firm, damp	12-14 21 ppm		12-14 ISL-111-02	(1212)
	15	14-16 Clayey sand (SC) - light brown (5YR 5/6), very fine to fine grained, subrounded, moist	14-16 0 ppm			
		16-18 Clayey Sand (SC) - dark yellowish orange (10YR 6/6), very fine grained, silty, moist	16-18 0 ppm			
		18-20 Clayey Sand (SC) - light gray (N7) to grayish orange (10YR 7/4), fine grained, damp	18-20 0 ppm			
	20	20-22 Silty Sand with gravel (SW) - dark yellowish orange (10YR 6/6), fine grained, with gravel 1/4"-2"	20-22 1 ppm			
		22-24 Clayey Sand (SC) - very pale orange (10YR 8/2), fine grained, micaceous, kaolinitic, damp	22-24 0 ppm			
	25	24-26 Sandy Clay (CL) - very light gray (N8), stiff, medium plasticity, micaceous, kaolinitic	24-26 0 ppm			
		26-28 Silty Sand (SM) - very light gray (N8), very fine grained, subangular, micaceous, moist	26-28 6 ppm		28'-30' ISL-111-03	(1305)
		28-30 Silty Sand (SM) - white (N9), fine to medium grained, subrounded, micaceous, wet	28-30 18 ppm			Water level at 29.6' bls 6/9/98 1310
	30	30-32 Silty Sand (SM) - white (N9), medium grained, subrounded, micaceous, kaolinitic, wet.	30-32 1 ppm			
	35	T. D. 32' bls 6/9/98 1320				
	40					
	45					

PROJECT

HOLE NO. ISL-111

HTRW DRILLING LOG

DISTRICT	
HOLE NUMBER	ISL-112
1. COMPANY NAME	SAIC
2. DRILL SUBCONTRACTOR	Alliance Environmental
SHEET / SHEETS	OF
3. PROJECT	AIP Soil Sampling
4. LOCATION	
5. NAME OF DRILLER	
6. MANUFACTURERS DESIGNATION OF DRILL	Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	
8. HOLE LOCATION	
9. SURFACE ELEVATION	
10. DATE STARTED	6/8/98
11. DATE COMPLETED	6/8/98
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Furlow

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT	HOLE NO.
	ISL-112

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-112

INSPECTOR:

SHEET:

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) 6/9/98
	0	0-2 Silty Sand (SM) - light brown (5YR 5/6), very fine grained, soft, dry	0-2 24 ppm		ISL-112-01 (1415) 0-2	
		2-4 Sandy Clay (CL) - light brown (5YR 5/6), silty, soft, low plasticity, dry	2-4 8 ppm			
	5	4-6 Clayey Sand (SC) - dark yellowish orange (10YR 6/6) medium to coarse grained, dry	4-6 5 ppm			
		6-8 Sandy Clay (CL) - light grey (N7) to pale reddish brown (10R 5/4), medium plasticity, dry	6-8 4 ppm			
		8-10 Sandy Clay (CL) - light gray (N7), stiff, dense, medium plasticity, micaceous, dry	8-10 13 ppm			
	10	10-12 Clayey Sand (SC) - light brown (5YR 5/6), very fine to fine grained, soft, damp	10-12 8 ppm			
		12-14 Sandy Clay (CL) - white (N9), stiff, medium to high plasticity, silty, damp	12-14 10 ppm			
	15	14-16 Sandy Clay (CL) - white (N9), stiff, medium plasticity, micaceous, kaolinitic, damp	14-16 28 ppm		14-16 ISL-112-02 (1450)	
		16-18 Sandy Clay (CL) - as above to 17', then Silty Sand (SM) - light brown (5YR 6/4), very fine grained	16-18 16 ppm			
		18-20 Sandy Clay (CL) - very light gray (N8) to 19', then silty sand (SM) - light brown (5YR 6/4) medium grained, damp	18-20 24 ppm			
	20	20-22 Silty Sand (SM) - light brown (5YR 6/4), fine grained, soft, micaceous, damp	20-22 2 ppm			
		22-24 Silty Sand (SM) - light brown (5YR 5/6), fine grained, loose, soft, micaceous, damp	22-24 6 ppm			
	25	24-26 Silty Sand (SM) - light brown (5YR 5/6), fine to medium grained, subangular, micaceous, damp	24-26 2 ppm			
		26-28 Sand (SP) - very pale orange (10YR 8/2), fine to medium grained, soft, loose, damp	26-28 2 ppm			
		28-30 Silty Sand (SM) - very pale orange (10YR 8/2), fine to coarse grained, micaceous, damp	28-30 2 ppm			
	30	30-32 Silty Sand (SM) - white (N9), fine grained, loose, soft, micaceous, subrounded, wet	30-32 3 ppm		30-32 ISL-112-03 (1528)	Water level at 32.5' bls 6/9/98 1540
		32-34 Sand (SP) - white (N9), medium grained, subangular, micaceous, wet	32-34 8 ppm			
		T.D. 34' 1530 6/9/98				

PROJECT:

HOLE NO. ISL-112

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER: ISL-120
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Alliance Environmental	SHEET / SHEETS OF
3. PROJECT: AIP Soil Sampling	4. LOCATION	
5. NAME OF DRILLER: Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION: ISL-120	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 6/10/98	11. DATE COMPLETED: 6/10/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 29.2' bls / 5 min.	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
20. SAMPLES FOR CHEMICAL ANALYSIS	**VOC**	**METALS**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**21. TOTAL CORE RECOVERY %**
	✓ (3)					
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR**		
				J. W. Furlow		

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT	HOLE NO

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER ISL-120

INSPECTOR

SHEET

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	0-2 Silty Sand (SM) - moderate brown (5YR 4/4), very fine grained, loose, dry	0-2 10 ppm		0-2 ISL-120-01	(0810)
		2-4 Silty Sand (SM) - light brown (5YR 5/6), very fine to fine grained, subangular, loose, dry	2-4 10 ppm		2-4 ISL-120-02	(0815)
	5	4-6 Clayey Sand (SC) - light brown (5YR 5/6), very fine to fine grained, firm, dry	4-6 8 ppm			
		6-8 Clayey Sand (SC) - light brown (5YR 5/6), fine to medium grained, subangular, firm, dry	6-8 6 ppm			
		8-10 Clayey Sand (SC) - dark yellowish orange (10YR 6/6), fine grained, soft, damp	8-10 6 ppm			
	10	10-12 Clayey Sand (SC) - dark yellowish orange (10YR 6/6), very fine to fine grained, stiff, dry	10-12 7 ppm			
		12-14 Clayey Sand (SC) - very light gray (N8), very fine grained, stiff, dense, subangular, dry	12-14 0 ppm			
	15	14-16 Sandy Clay (CL) - very light gray (N8), hard, dense, medium plasticity, dry	14-16 0 ppm			
		16-18 Clayey Sand (SC) - very light gray (N8), fine to medium grained, hard, dense, damp	16-18 0 ppm			
		18-20 Clayey Sand (SC) - light gray (N7) very fine to fine grained, subangular, hard, dry	18-20 0 ppm			
	20	20-22 Sandy Clay (CL) - very light gray (N8), stiff, dense, micaceous, kaolinitic, med. plasticity	20-22 0 ppm			
		22-24 Silty clay (CL) - light gray (N7), stiff, dense, medium plasticity, micaceous, kaolinitic, dry	22-24 0 ppm			
	25	24-26 Silty Clay (CL) - light gray to light brown (N7 to 5YR 5/6) medium plasticity, stiff, dense, dry	24-26 0 ppm			
		26-28 Silty Clay (CL) - light gray (N7) to light brown (5YR 5/6) stiff, medium plasticity, dry	26-28 0 ppm			
		28-30 Silty Clay (CL) - light gray (N7) to light brown (5YR 5/6) soft, medium plasticity, dry	28-30 0 ppm		28-30 ISL-120-03	(1005)
	30	30-32 Clayey Sand (SC) - grayish orange (10YR 7/4), fine to coarse grained, subangular, wet	30-32 0 ppm			
		32-34 Silty Sand (SM), - light brown (5YR 5/6), fine to coarse grained, subangular, loose, wet	32-34 0 ppm			Water level at 29.2' bls 6/10/98 1020
	35					
		T.D. 34' 6/10/98 1015				
	40					
	45					

PROJECT

HOLE NO. ISL-120

HTRW DRILLING LOG

DISTRICT	
1. COMPANY NAME	SAIC
2. DRILL SUBCONTRACTOR	Alliance Environmental
HOLE NUMBER	ISL-
SHEET	OF
3. PROJECT	AIP Soil Sampling
4. LOCATION	
5. NAME OF DRILLER	Mike Coleman
6. MANUFACTURER'S DESIGNATION OF DRILL	Mobile B-61
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	
8. HOLE LOCATION	
9. SURFACE ELEVATION	
10. DATE STARTED	6/10/98
11. DATE COMPLETED	6/10/98
12. OVERBURDEN THICKNESS	
15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE	
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES		

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	3					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR

LOCATION SKETCH/COMMENTS

SCALE:

PROJECT

ENG FORM 5056-R, AUG 94

HOLE NO. ISL-118

(Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER ISL-118

INSPECTOR

SHEET

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)
		0-2 Clayey Sand (SC) - light brown (5YR 5/6), very fine to fine grained, silty, firm, dry	0-2 0 ppm		0-2 ISL-	118-01 (1120)
		2-4 Silty Sand (SM) - dark yellowish orange (10YR 6/6), very fine grained, soft, dry	2-4 0 ppm			
	5	4-6 Clayey Sand (SC) - dark yellowish orange (10YR 6/6), fine grained, subangular, dry	4-6 0 ppm			
		6-8 Clayey Sand (SC) - dark yellowish orange (10YR 6/6), very fine grained, silty, damp	6-8 0 ppm			
		8-10 Clayey Sand (SC) - light gray (N7), fine grained, subangular, firm, damp	8-10 0 ppm			
	10	10-12 Sandy Clay (CL) - light gray (N7), hard, dense, low plasticity, mottled, dry	10-12 0 ppm		10'-12' ISL-	118-02 (1135)
		12-14 Clayey Sand (SC) - very pale orange (10YR 8/2), medium grained, subangular, silty, damp	12-14 0 ppm			
	15	14-16 Silty Sand (SM) - moderate orange pink (5YR 8/4) fine to medium grained, subangular	14-16 0 ppm			
		16-18 Silty Sand (SM) - light gray (N7), fine to medium grained, subangular, micaceous, soft, damp	16-18 0 ppm			
		18-20 Silty Sand (SM) - very pale orange (10YR 8/2), fine to medium grained, with gravel to 1/2"	18-20 0 ppm			
	20	20-22 Silty Sand (SM) - as above to 21', then Clay (CL) - light gray (N7), stiff, dense, wet above clay.	20-22 0 ppm		20'-22' ISL-118	-03 (1204) Approximate Water Level at 22' bls 6/10/98 1215
		22-24 Clayey Sand (SC) - light brown (5YR 5/6), fine to coarse grained, subangular, some 1/4" gravel, wet.	22-24 0 ppm			
	25					
		T.D. 24' 6/10/98 1210				
	30					
	35					
	40					
	45					

PROJECT

HOLE NO. ISL-118

HTRW DRILLING LOG

DISTRICT		HOLE NUMBER: ISL -119
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Alliance Environmental	SHEET OF SHEETS
3. PROJECT: AIP Soil sampling	4. LOCATION	
5. NAME OF DRILLER: Mike Coleman	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-61	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8. HOLE LOCATION	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 6/10/98	11. DATE COMPLETED: 6/10/98
12. OVERBURDEN THICKNESS	15. DEPTH GROUNDWATER ENCOUNTERED	
13. DEPTH DRILLED INTO ROCK	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 23.1' bls / 10 min.	
14. TOTAL DEPTH OF HOLE	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	3					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
				J. W. Farlow

LOCATION SKETCH/COMMENTS SCALE:

PROJECT	HOLE NO. ISL-119

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: ISL-119

PROJECT:

INSPECTOR:

SHEET:

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	0-2' Silty Sand (SM) - light brown (5YR 5/6), very fine to fine grained, firm, dry	0'-2' 0 ppm		0'-2' ISL-119-01 (1302)	
		2-4' Silty Sand (SM) - light brown (5YR 5/6), very fine grained, firm, dry	2-4 0 ppm			
	5	4-6 Clayey Sand (SC) - light brown (5YR 5/6), very fine grained, subrounded, firm, dry	4-6 0 ppm			
		6-8 Clayey Sand (SC) - light brown (5YR 5/6) to light gray (N7), very fine grained, dry	6-8 0 ppm			
		8-10 Sandy Clay (CL) - dark yellowish orange (10YR 6/6), firm, medium plasticity, dry	8-10 0 ppm			
	10	10-12 Sandy Clay (CL) - light grey (N7), hard, dense, medium plasticity, kaolinitic, dry	10-12 0 ppm		10'-12' ISL-119-02 (1320)	
		12-14 Sandy Clay (CL) - light gray (N7), hard, dense, medium plasticity, micaceous, kaolinitic, dry	12-14 0 ppm			
	15	14-16 Clay (CH) - very light gray (N8), hard, dense, high plasticity, kaolinitic, dry	14-16 0 ppm			
		16-18 Silty Clay (CL) - very light gray (N7), hard, dense, medium plasticity, dry	16-18 0 ppm			
		18-20 Silty Sand (SM) - Pale yellowish orange (10YR 8/6) very fine grained, soft, wet at bottom	18-20 0 ppm			
	20	20-22 Clayey Sand (SC) - very light gray (N8), fine grained, micaceous, kaolinitic, wet	20-22 0 ppm			
		22-24 Silty Sand (SM) - light brown (5YR 5/6), medium grained, with gravel to 1/4", wet	22-24 0 ppm		22'-24' ISL-119-03 (1350)	
	25	24-26 Silty Sand (SM) - light brown (5YR 5/6), coarse grained, subangular, loose, wet	24-26 0 ppm			
		T.D. 26' bls				
	30	6/10/98 ~~1355~~ JWF 1400				Water level at 23.1' bls 6/10/98 1410
	35					
	40					
	45					

PROJECT:

HOLE NO.:

APPENDIX C
Geologic Logs
Coring Phase

OSR 30-3 (Rev 12-89)

FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring 345.8	3/19/98	1 OF 7
	DRILLING SUBCONTRACTOR: Alliance Environmental, Inc.	

WELL NO.	LOCATION	DRILLER
CH-1	NW part of A.I.P.	Marty Proctor

LOGS PREPARED BY	COMPANY	DRILLING METHOD
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	0–5			Note: Hole was hand augered to depth of 5 feet. 0'–5' CLAY: moderate reddish brown (10 YR 5/4), laminated, sandy, silty, firm, medium plasticity (CL)	
1	5–15	Begin Coring	0730 100 0816	5'–15' SAND: light gray (N7) to moderate reddish brown (10 R 4/6), laminated, medium to coarse grained, subangular, clayey to very clayey, dense, stiff (SC)	0750 P.I.D.: 0.0 PPM
2	15–20		0828 100	15'–25' SAND: grayish pink (5R 8/2) to dark yellowish orange (10 YR 6/6) to very pale orange (10 YR 8/2), poorly laminated, medium to coarse grained, subrounded, slightly clayey, silty, firm to loose (SM)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/19/98	2 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-1	-	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
2	20				0847 P.I.D.: 0.0 PPM
	1				
	2		100		
	3				
	4		0908		
3	5		0922		
	6			25'-35' SAND: pinkish gray (5YR 8/1) to grayish yellow (5Y 8/4), fine to medium grained, subangular, silty to slightly clayey, loose (SM)	
	7				
	8				
	9		100		
	30				0945 P.I.D: 0.0 PPM
	1				
	2				
	3				
	4		0950	Sand becomes coarse grained with 1/4"-1/2" gravel, clayey from 34' to 35'	
4	5		1000		
	6			35'-45' SAND: very pale orange (10YR 8/2) to very light gray (N8) to white (N9), medium to coarse grained, with 1/4"-1/2" gravel at 40', silty, loose (SM)	
	7				
	8		100		
	9				
	40				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/19/98	3 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-1	–	Marty Proctor

LOGS PREPARED BY	COMPANY	DRILLING METHOD
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	40				
	1				1005 P.I.D: 0.0 PPM
4	2		100	Sand becomes fine to medium grained and uniformly whiter at 42'	
	3				
	4		1007		
	5		1014	45'-46' SAND: dark reddish brown (10R 3/4), medium to coarse grained with 1/4"-1" gravel, subangular, silty (SM)	
	6				
	7			46'-55' CLAY: pale red (5R 6/2) and very light gray (N8) to 53'; becoming very pale blue (5B 8/2), laminated 53'-55', silty, dense, stiff, friable, dry, low plasticity.	
	8				
5	9		100		1034 P.I.D.: 0.0 PPM
	50				
	1				
	2				
	3				
	4		1038		
	5		1050	55'-57.5' SAND: very light gray (N8) to moderate orange pink (10R 7/4), laminated, medium grained, subangular, silty, clayey (SC)	
	6				
	7				
6	8		100	57.5-59 CLAY: very light gray (N8), silty, very sandy, dense, stiff, friable, dry, low to medium plasticity (CL)	
	9				
	60				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring	DATE: 3/19/98
SHEET: 4 OF 7	DRILLING SUBCONTRACTOR: Alliance Env.
WELL NO.: CH-1	LOCATION:
DRILLER: Marty Proctor	LOGS PREPARED BY: Jim Furlow
COMPANY: SAIC	DRILLING METHOD:

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
6	60			59'-64' SAND: very light gray (N8), medium grained, subangular, clayey, firm (SC)	1103 P.I.D.: 0.0 PPM
	1				
	2		100		
	3				
	4			64'-65' CLAY: light gray (N7), sandy, dense, stiff, low plasticity (CL)	
	5		1110		
7	5		1124	65'-67' SAND: very light gray (N8), medium to coarse grained with some small gravel to ¼", subangular, very clayey, dense, firm (SC)	
	6				
	7				
	8		100	67'-75' CLAY: very light gray (N8) to light brown (5YR 5/6) to moderate reddish orange (10 R 6/6), laminated, very sandy, dense, stiff, low to medium plasticity (CL)	
	9				1137
	70				P.I.D: 0.0 PPM
	1				
	2			Clay becomes sandier 72'-75'	
	3				
	4				
	5		1142		
8	5		1204	75'-85' CLAY: very light gray (N8) to moderate reddish brown (10 R 4/6), laminated, very sandy, dense, stiff, low plasticity (CL)	
	6				
	7		100		
	8				
	9			79-81 Clay becomes less sandy, hard, dry	
	80				1211 P.I.D.: 0.0 PPM

OSR 30-3 (Rev 12-89)

FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/19/98	6 OF 7

DRILLING SUBCONTRACTOR	Alliance Env.
WELL NO.	CH-1
LOCATION	
DRILLER	Marty Proctor
LOGS PREPARED BY	Jim Furlow
COMPANY	SAIC
DRILLING METHOD	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
10	100–105		100 (1402)	100'–102' CLAY: very light gray (N8) with pale red (5R 6/2) laminations, sandy, hard, friable, dry, low plasticity (CL) 102'–105' SAND: very light gray (N8) with pale yellowish orange (10YR 8/6) laminations, fine grained, silty, clayey, firm to soft, with fine flakes of mica (SM)	1400 P.I.D.: 0.0 PPM
11	105–115		(1413) 100 (1430)	105'–115' SAND: very light gray (N8) to grayish pink (5R 8/2) to pale yellowish orange (10YR 8/6), laminated, medium grained, subangular, slightly clayey, soft, loose (SC) No laminations present 101'–105'. Sand is uniformly very light gray (N8) in color.	1425 P.I.D.: 0.0 PPM
12	115–120		(1452) 100	115'–121' SAND: very light gray (N8), medium grained, subangular, slightly silty to slightly clayey, soft, loose, with fine flakes of mica (SC)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/19/98	5 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-1	-	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
8	80				
	1			Clay becomes very sandy again 81'-85'	
	2		100		
	3				
	4		1218		
9	5		1310	85'-86.5' CLAY: very light gray (N8), laminated, sandy, dense, hard, low plasticity (CL)	
	6				
	7			86.5'-95' SAND: very light gray (N8) to pale red purple (5RP 6/2), laminated, medium grained, subangular, clayey, firm to soft (SC)	
	8				
	9		100		1322 P.I.D.: 0.0 PPM
	90				
	1				
	2				
	3			Sand becomes fine grained 93'-95'	
	4		1333		
10	5		1354		
	6			95'-100' SAND: very light gray (N8) to moderate orange pink (10R 7/4), mottled, medium grained, subrounded, silty to clayey, soft, loose (SM)	
	7				
	8		100		
	9				
	100				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring	DATE: 3/19/98	SHEET 7 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env	
WELL NO.: CH-1	LOCATION:	DRILLER: Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
12	120		100	121-122' CLAY: yellowish gray (5Y 8/1) to grayish pink (5R 8/2), silty, hard, friable, dry (CL)	1450 P.I.D: 0.0 PPM
	1				
	2			122'-123' SAND: yellowish gray (5Y 8/1), very fine grained, silty, clayey, firm (SC)	
	3	T.D. of Boring: 123'	1500		
	4				
	5				
	6				
	7				
	8				
	9				
	130				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	140				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring	DATE: 3/21/98	SHEET 1 OF 8
373.5	DRILLING SUBCONTRACTOR: Alliance Environmental, Inc	
WELL NO.: CH-2	LOCATION: Southeast of Bldg. 102	DRILLER: Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
N/A	0				
	1			Note: Location CH-2 was hand augered to a depth of 5 feet prior to coring.	
	2		N/A	0'-5' CLAY: moderate reddish brown (10R 4/6), mottled, sandy, soft (CL)	
	3				
	4		1004		
1	5		1008	5'-7' CLAY: moderate reddish brown (10R 4/6) with pale yellowish orange (10YR 8/6) laminations, sandy, soft to firm, medium plasticity (CL)	
	6				
	7				
	8				
	9		100	7'-15' SAND: moderate reddish brown (10R 4/6), fine to medium grained, very clayey, firm, medium plasticity (SC)	
	10				1028 P.I.D.: 0.0 PPM
	1				
	2				
	3				
	4		1052		
2	5		1101	15'-18' CLAY: moderate reddish brown (10R 4/6) with pale yellowish orange (10YR 4/6) laminations, silty, firm, low plasticity (CL)	
	6				
	7		100		
	8			18'-22' SAND: moderate reddish brown (10R 4/6), fine to very fine grained, silty, clayey, soft (SM)	
	9				
	20				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/21/98	2 OF 8
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-2		Marty Proctor
LOGS PREPARED BY	COMPANY	DRILLING METHOD
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
2	20–25		100 (1128)	22'-26' CLAY: moderate reddish orange (10R 6/6) to very light gray (N8), mottled, dense, hard, friable, dry (CL)	1108 P.I.D.: 0.0 PPM
3	25–35		(1134) 100 (1148)	26'-29' CLAY: Pale red (5R 6/2) to dark yellowish orange (10YR 6/6), mottled to laminated, silty, soft, medium plasticity (CL) 29'-35' SAND: dark yellowish orange (10YR 6/6) to pale yellowish orange (10YR 8/6), medium to coarse grained with abundant gravel ¼"-1", subangular, slightly clayey to silty, loose (SM)	1141 P.I.D.: 0.0 PPM
4	35–40		(1152) 100	35'-43' SAND: pale yellowish orange (10YR 8/6), fine grained, subangular, becoming medium to coarse grained 42'-43', occasional gravel ¼"-3", slightly silty, loose (SM)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/21/98	3 OF 8
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-2		Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
4	40–45		100 (1260)	Sand becomes very light gray (N8) with 1/4" gravel 43'-45' <u>CLAY</u>: very light gray (N8), dense, firm to hard, dry, friable, low plasticity (CL)	1157 P.I.D.: 0.0 PPM
5	45–55		(1314) 100 (1322)	45'-48' <u>CLAY</u>: very light gray (N8), silty, micaceous, soft, medium plasticity (CL) 48'-54.5' <u>SAND</u>: very light gray (N8) to grayish yellow (5Y 8/4), medium grained, subangular, clayey, micaceous, soft (SC) 54.5'-55' <u>CLAY</u>: very light gray (N8), dense, stiff, medium plasticity, dry (CL)	1320 P.I.D.: 0.0 PPM
6	55–60		(1331) 100	55'-59.5' <u>CLAY</u>: very light gray (N8), dense, stiff to hard, slightly sandy, medium plasticity, dry (CL)	

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring		DATE: 3/21/98 — SHEET 4 OF 8
		DRILLING SUBCONTRACTOR: Alliance Env.
WELL NO.: CH-2	LOCATION: -	DRILLER: Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
6	60–65		100 (1340)	59.5'-65' SAND: pale red 59'-60' to very light gray (N8) 60'-65', fine to medium grained, subangular, clayey 59'-61', silty 61'-65', micaceous, loose (SM)	1337 P.I.D.: 0.0 PPM
7	65–75		(1348) 100 (1359)	65'-75' SAND: very light gray (N8) to pale yellowish orange (10YR 8/6), medium grained, silty, clayey 66'-67', subangular, loose, with occasional 1/4" gravel (SM)	1355 P.I.D.: 0.0 PPM
8	75–80		(1412) 100	75'-85' SAND: very light gray (N8) to pale yellowish orange (10YR 8/6) to moderate pink (5R 7/4), fine to medium grained, subangular to subrounded, clean 75'-80', silty and micaceous 80'-85', loose (SW/SM)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/21/98	5 OF 8
	DRILLING SUBCONTRACTOR: Alliance Env	

WELL NO.	LOCATION	DRILLER
CH-2		Marty Proctor
LOGS PREPARED BY	COMPANY	DRILLING METHOD
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	80				1417 P.I.D.: 0.0PPM
8	81–84		100		
	84			Sand becomes medium to coarse grained 84'-85'	
	85		1434 / 1445	85'-88' SAND: grayish red (5R 4/2) to pale red (5R 6/2), medium grained, subangular, clayey 85'-86.5', very clayey 86.5'-88', soft to firm (SC)	
9	88			88'-92' CLAY: very light gray (N8) to pale red (5R 6/2), very sandy, hard, dense, friable, dry, low plasticity (CL)	
	90		100		1452 P.I.D.: 0.0PPM
	92			92'-93' SILT/SILTSTONE: light gray (N7) to very light gray (N8) to pale yellowish orange (10YR 8/6), laminated, mottled, sandy, hard, dense, dry, friable (ML)	
	93			93'-95' SAND: very light gray (N8) to pale yellowish orange (10YR 8/6), laminated, fine to medium grained, very clayey, stiff, dense (SC)	
	95		1500 / 1518		
10	96–99		100	95'-105' SAND: very light gray (N8) with moderate orange pink (10R 7/4) and pale yellowish orange (10YR 8/6) laminations, fine to medium grained, subangular, very clayey, dense, firm (SC)	
	100				

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/21/98	6 OF 8
		DRILLING SUBCONTRACTOR Alliance Env.	
WELL NO. CH-2	LOCATION	DRILLER Marty Proctor	
LOGS PREPARED BY Jim Furlow	COMPANY SAIC	DRILLING METHOD	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	100				1527 P.I.D. : 0.0 PPM
	1				
10	2		100		
	3				
	4		1530		
	5		1556		
	6			105'–115' SAND: very light gray (N8) with moderate orange pink (10R 7/4) and pale yellowish orange (10YR 8/6) laminations, fine to medium grained, subangular, with occasional gravel 1/4"–1/2", clayey 105'-108', very clayey 108'-115', soft 105'-108', stiff 108'-115, dense (SC)	
	7				
	8				
11	9		100		
	110				1602 P.I.D: 0.0 PPM
	1				
	2				
	3				
	4		1605		
	5		1624		
	6			115'–125' SAND: very light gray (N8) with pale red (5R 6/2) to pale yellowish orange (10YR 8/6) laminations, medium grained, subangular, clayey to very clayey, stiff, dense (SC)	
	7				
12	8		100		
	9				
	120				

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/21/98	7 OF 8
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-2	LOCATION: -	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	120				1628
					P.I.D.: 0.0 PPM
	1				
12	2		100		
	3				
	4				
	5		1637	3/21/98	
			0732	3/22/98	
	6				
	7			125'-135' SAND: very light gray (N8) with pale red (5R 6/2) laminations 127'-129', fine to medium grained, subangular, very clayey and firm 125'-133', slightly clayey and loose 133'-135' (SC)	
	8				
	9				
13	130				0746
					P.I.D.: 0.0 PPM
	1				
	2				
	3				
	4				
	5		0754		
			0948	135'-136.5' SAND: very light gray (N8), fine to medium grained, subangular, slightly clayey, loose (SC)	
	6				
	7			136.5'-143.5' CLAY: very light gray (N8) with occasional pale yellowish orange (10YR 8/6) to pale red (5R 6/2) laminations, increasing in frequency 142.5'-143.5', sandy to silty, hard, dense, dry, friable, some low plasticity (CL)	
	8				
	9				
	140				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/22/98	8 OF 8

WELL NO.	LOCATION	DRILLING SUBCONTRACTOR
CH-2	-	Alliance Env.

LOGS PREPARED BY	COMPANY	DRILLER	DRILLING METHOD
Jim Furlow	SAIC	Marty Proctor	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
14	140–145		100	143.5'–145' SAND: pale red (5R 6/2) to moderate orange pink (5YR 8/4), medium grained, subangular, very clayey, stiff (SC)	1008 P.I.D.: 0.0PPM
15	145–155		100	145'–155' SAND: moderate orange pink (5YR 8/4) to very light gray (N8) to pale yellowish orange (10YR 8/6), medium grained, subangular, slightly clayey to clayey 145'–153', silty 153'–155', soft 145'–153', loose 153'–155' (SC)	1038 P.I.D.: 0.0PPM
	155–160	Total Depth of Boring: 155'			

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/23/98	1 OF 5
317.5		DRILLING SUBCONTRACTOR Alliance Environmental	
WELL NO. CH-3	LOCATION	DRILLER Marty Proctor	
LOGS PREPARED BY Jim Furlow	COMPANY SAIC	DRILLING METHOD Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
N/A	0–5		N/A	Location CH-3 hand augered to 5' 0'–5' SAND: light brown (5YR 5/6), fine grained, subangular, clayey, soft (SC)	
1	5–15		0830 100 0842	5'–6' CLAY: dark yellowish orange (10YR 6/6), sandy, stiff, medium plasticity (CL) 6'–7.5' SAND: dark yellowish orange (5YR 5/6), fine grained, subangular, clayey, silty, soft, with gravel up to 1" (SC) 7.5'–15' CLAY: very light gray (N8) to moderate reddish brown (10R 4/6) to dark yellowish orange (10YR 6/6), laminated, slightly sandy 10'–11', stiff, low plasticity (CL) Clay becomes medium light gray (N6) 13.5'–15'	0837 P.I.D. : 0.0 PPM
2	15–20		0847 100	15'–24.5' CLAY: light gray (N7) with moderate reddish orange (10R 6/6) laminations, slightly sandy 15'–18', stiff, dense, low plasticity (CL)	

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring	DATE: 3/23/98
SHEET: 2 OF 5	DRILLING SUBCONTRACTOR: Alliance Env.
WELL NO.: CH-3	LOCATION:
DRILLER: Marty Proctor	LOGS PREPARED BY: Jim Furlow
COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	20				0852 P.I.D.: 0.0 PPM
	1				
			100		
2	2				
	3				
	4			24.5'-25' SAND: dark yellowish orange (10 YR 6/6), fine to medium grained, subrounded, silty, slightly clayey, loose (SM)	
			0859		
	5		0901		
	6				
	7				
	8			25'-35' SAND: dark yellowish orange (10 YR 6/6) to very pale orange (10 YR 8/2) to pale yellowish orange (10YR 8/6) to white (N9), fine to medium grained, subangular, silty to clean, loose (SM)	
	9				
3			70		
	30				0905 P.I.D.: 0.0 PPM
	1				
	2				
	3				
	4				
			0908		
	5		0930		
	6				
	7			35'-43' SAND: White (N9) to moderate orange pink (10R 7/4) to grayish red (5R 4/2), fine to medium grained, subangular, silty, loose (SM)	
4	8		100		
	9				
	40				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/23/98	3 OF 5
	DRILLING SUBCONTRACTOR: Alliance Env	

WELL NO.	LOCATION	DRILLER
CH-3		Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
4	40–45		100 (0938)	Sand becomes laminated and clayey 41'-43' 43'-45' CLAY: very light gray (N8) with pale red (5R6/2) mottling, slightly sandy, dense, hard, low plasticity (CL)	0934 P.I.D.: 0.0 PPM
5	45–55		0946 100 0958	45'-49' CLAY: very light gray (N8) with moderate red (5R 4/6) to pale yellowish orange (10YR 8/6) laminations, slightly sandy to sandy, dense, stiff, low plasticity (CL) 49'-53' SAND: very light gray (N8) to white (N9), very fine to medium grained, subrounded, silty, clayey, soft to firm (SM) 53'-55' CLAY: very light gray (N8) with pale yellowish orange (10YR 8/6) laminations, sandy to slightly sandy, dense, hard, low plasticity (CL)	0954 P.I.D.: 0.0 PPM
6	55–60		1006 100	55'-56.5' SAND: very light gray (N8) to grayish pink (5R 8/2), medium grained, subangular, very clayey, soft (SC) 56.5'-58.5' CLAY: very light gray (N8) with pale red (5R6/2) to dark yellowish orange (10YR 6/6) laminations, slightly sandy, dense, hard, low plasticity (CL)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/23/98	4 OF 5

WELL NO.	LOCATION	DRILLING SUBCONTRACTOR
CH-3	-	Alliance Env

LOGS PREPARED BY	COMPANY	DRILLER	DRILLING METHOD
Jim Furlow	SAIC	Marty Proctor	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
6	60–65		100 1015	58.5'-61' SAND: very light gray (N8) with pale red (5R6/2) to dark yellowish orange (10YR 6/6) laminations, medium grained, very clayey, soft to hard (SC) 61'-62.5' CLAY: very light gray (N8) with dark yellowish orange (10R6/6) laminations, sandy, dense, hard, low plasticity (CL) 62.5-65 SAND: very light gray (N8) with dark yellowish orange (10YR 6/6) laminations, medium grained, very clayey, soft to hard (SC)	1012 P.I.D.: 0.0 PPM
7	65–75		1025 100 1034	65-66.5 SAND: very light gray (N8), medium grained, subangular, very clayey, dense, firm (SC) 66.5-68.5 CLAY: very light gray (N8) with pale red (5R6/2) to pale yellowish orange (10YR 8/6) laminations, very sandy, dense, hard, low plasticity (CL) 68.5'-75' SAND: very light gray (N8) with pale red (5R6/2) to pale yellowish orange (10YR 8/6) laminations, medium grained, subangular, very clayey, dense, stiff (SC)	1031 P.I.D.: 0.0 PPM
8	75–80		1104 100	75'-77' SAND: very light gray (N8), medium grained, subangular, very clayey, dense, firm (SC) 77'-81' CLAY: very light gray (N8), dense, hard, dry, friable (CL)	

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/23/98	5 OF 5
		DRILLING SUBCONTRACTOR Alliance Env	
WELL NO. CH-3	LOCATION	DRILLER Marty Proctor	
LOGS PREPARED BY Jim Furlow	COMPANY SAIC	DRILLING METHOD Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
8	80–85		100	Clay becomes slightly silty to sandy 80'-81' 81'-85' SAND: very light gray (N8) with pale red (5R 6/2) and pale yellowish orange (10YR 8/6) laminations, fine to medium grained, subangular, very clayey, soft to firm (SC)	1115 P.I.D.: 0.0 PPM
			1120		
9	85–95		1132	85'-89' SAND: very light gray (N8) with pale red (5R 6/2) and pale yellowish orange (10YR 8/6) laminations, medium grained, subrounded, clayey, soft (SC) 89'-91' CLAY: very light gray (N8) with pale red (5R 6/2) laminations, silty to sandy, dense, hard, low plasticity (CL) 91'-94' SAND: very light gray (N8) with pale red (5R 6/2) laminations, fine to medium grained, subangular, very clayey, firm (SC) 94'-95' CLAY: very light gray (N8) with pale yellowish orange (10YR 8/6) laminations and mottling, slightly sandy, silty, dense, hard, friable to low plasticity (CL)	1137 P.I.D.: 0.0 PPM
			1140		
	95–100	T.D. of Boring 95'			

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/17/98	1 OF 7
346.1	DRILLING SUBCONTRACTOR: Alliance Environmental	

WELL NO.	LOCATION	DRILLER
CH-4	Between Bldgs 106 & 107	Marty Proctor

LOGS PREPARED BY	COMPANY	DRILLING METHOD
Jim Furlow	SAIC	Rotosonic Coring

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
1	0–6		30	0'-6' CLAY: moderate reddish brown (10 R 4/6), sandy, stiff, moderate plasticity (CL)	P.I.D: 0.4 PPM
2	6–16		100	6'-13' CLAY: dark reddish brown (10 R 3/4) with gray laminations, dense, very stiff, low plasticity (CL)	
				13'-14' CLAY: dark reddish brown (10 R 3/4), sandy, stiff, low plasticity (CL)	P.I.D.: 0.2 PPM
				14'-16' SAND: pale reddish brown (10 R 5/4) medium grained, clayey, loose, with abundant gravel 1/4"-3" in diameter (GM)	
3	16–20		100	16'-17' SAND: moderate reddish brown (10 R 4/6), medium to coarse grained with abundant gravel 1/4"-1/2" in dia., silty, clayey (GC)	
				17'-19' SAND: light brown (5YR 5/6), medium to coarse grained with small gravel 1/4"-1/2" dia., silty, clayey (GC)	

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring			2 OF 7
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-4	LOCATION: Between Bldgs. 106 & 107	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
3	20			19'-26' CLAY: pinkish gray (5YR 8/1) to very light gray (N8), dense, stiff, silty, low plasticity (ML)	
	1				
	2		100		
	3				P.I.D: 0.0 PPM
	4			Becomes very sandy in lower three feet (23'-26')	
	5				
4	6				
	7			26'-35' SAND: very light gray (N8), medium grained, subangular, loose, silty (SM)	
	8				
	9				
	30		100	Sand becomes fine grained, silty, slightly clayey	
	1				
	2				
	3			Sand becomes very clayey	P.I.D.: 0.0 PPM
	4				
	5			35'-36' CLAY: very light gray (N8), very sandy, dense, firm, medium to high plasticity (SC)	
5	6				
	7			36'-38' CLAY: grayish pink (5R 8/2), laminated, dense, stiff, sandy, medium plasticity (CL)	
	8		100		
	9			38'-41' SAND: very pale orange (10YR 8/2), fine to medium grained, silty, clayey (SC)	
	40				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/17/98	3 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-4	–	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	40				
	1			41'–46' SAND: grayish pink (5/R 8/2) fine grained, loose, silty, subangular (SM)	
5	2		100		
	3			Sand becomes cleaner, less silty	P.I.D. no longer working properly
	4				
	5				
	6			46'–56' SAND: very pale orange (10YR 3/2) to very light gray (N8), coarse to fine grained, subangular, loose, slightly silty (SM)	
	7				
	8				
	9				
6	50		40		
	1				
	2				
	3				
	4				
	5				
	6			56'–64' SAND: pinkish gray (5YR 8/1) to moderate pink (5R 7/4), medium grained, subangular, loose, silty, with small amount of gravel 1/4"–1" at 60' (SM)	
	7				
7	8		100		
	9				
	60				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring	DATE: 3/17/98	SHEET 4 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-4	LOCATION: –	DRILLER: Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
7	60		100	Sand becomes fine grained at 61'	
	2			Sand becomes medium grained at 62'	
	3			Sand becomes darker and coarser grained	
	64			64'-66' CLAY: grayish red (5R 4/2), laminated, silty, sandy, hard, stiff, low plasticity, dry, friable (CL)	
8	66		100	66'-70' CLAY: grayish pink (5R 8/2), laminated, silty, sandy, stiff, low plasticity, dry (CL)	
	8			clay becomes sandier and moderate reddish brown (10R 4/6)	
	70			70'-74' SAND: very light gray (N8) to moderate reddish brown (10R 4/6), fine to medium grained, subangular, dense, clayey, silty (SC)	
	74			74'-76' CLAY: moderate orange pink (10R 7/4), laminated, silty, slightly sandy, stiff, hard, low plasticity, dry (CL)	End of coring 3/17/98
9	76		0734 100	76'-78' CLAY: light brown (5YR 5/6) to light gray (N7) to grayish pink (5R 8/2) laminated, dense, hard, stiff, sandy, low plasticity, dry (CL)	
	80				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/18/98	5 OF 7
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-4		Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
9	80–86		100 (0753)	78'-86' SAND: grayish pink (5R 8/2) to very pale orange (10YR 8/2), fine to medium grained, subrounded, clayey, silty, firm to loose (SC) Sand becomes less clayey 84'-86'	
10	86–96		100 (0810–0835)	86'-96' SAND: pinkish gray (5YR 8/1) to very light gray (N8), laminated, medium to coarse grained with some gravel 1/4"-3/4" in dia., subangular, very clayey, firm, stiff (SC)	
11	96–100		100 (0902)	96'-97' CLAY: very light gray (N8), partially laminated, very sandy, stiff, medium plasticity (CL) 97'-103' SAND: very light gray (N8) to moderate red (5R 4/6) to dark yellowish orange (10YR 6/6), laminated, medium to coarse grained, subangular, clayey to very clayey, soft (SC)	

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring		DATE: 3/18/98	SHEET: 6 OF 7
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-4	LOCATION: -	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
11	100–106		100 (0917)	103'-106' CLAY: very light gray (N8) to dark yellowish orange (10YR 6/6), laminated, sandy to very sandy (very sandy 104'-105') firm, very low plasticity, dry (CL)	
12	106–116		0934; 100 (0948)	106'-113' SAND: yellowish gray (5Y 8/1), medium to coarse grained, subangular, very clayey, soft (SC)	
				113'-116' CLAY: very light gray (N8) to pale yellowish orange (10YR 8/6), laminated, silty, hard, friable, no plasticity, dry (ML)	
13	116–120		1006; 100	116'-118' CLAY: very light gray (N8) to moderate red (5R 4/6), laminated, sandy, firm, medium plasticity (CL)	

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring		DATE: 3/18/98	SHEET 7 OF 7
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-4	LOCATION: -	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
13	120–126		100	118'-124' SAND: very light gray (N8) to pale red purple (5RP 6/2) to grayish pink (5R 8/2), laminated, medium grained, subangular, very clayey, firm, dense (SC)	
				124'-126' SAND: grayish pink (5R 8/2) to pinkish gray (5YR 8/1), medium to coarse grained, subangular, silty, loose (SM)	
			1030		
14	126–130		1112	126'-127.5' CLAY: pinkish gray (5YR 8/1) to pale red purple (5RP 6/2), laminated, sandy, stiff, hard, low plasticity, dry (CL)	
			100	127.5'-130' SAND: moderate pink (5R 7/4), medium grained, subangular, silty, slightly clayey, becomes fine grained and less silty 129'-130' (SM)	
	130	T.D. of Boring: 130'	1120		
	131–140				

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring 337.1		3/20/98	1 OF 6
		DRILLING SUBCONTRACTOR: Alliance Environmental, Inc.	
WELL NO.: CH-5	LOCATION: South of Politex warehouse	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
Hand Augered	0			Note: Drill hole location was hand augered to depth of 5 feet prior to drilling.	
	2		0	0'-5' SAND: dark yellowish orange (10YR 6/6), fine grained, clayey, loose (SC)	
	5		0817	Begin coring at 5'	
1	6			5'-15' SAND: moderate reddish brown (10R 4/6) to grayish orange (10YR 7/4), laminated 5'-7', fine to medium grained, subangular, clayey, silty (SC)	
	9		100		0835 P.I.D.: 0.0 PPM
	13			Sand becomes coarse grained with 1/4"-2" gravel 13'-14'	
	15		0854 / 0908		
2	16			15'-20' SAND: moderate reddish brown (10R 4/6) to light gray (N7), laminated to mottled, medium grained, subangular, clayey, silty, loose (SC)	
	18		100		
	19			Sand contains 1/4"-3" gravel 19'-20'	
	20				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring		DATE: 3/20/98	SHEET: 2 OF 6
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-5	LOCATION: -	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
2	20–25		100	20'-23.5' SAND: pale yellowish orange (10YR 8/6) to moderate orange pink (5YR 8/4), fine grained, subangular, silty, loose (SM)	0925 P.I.D.: 0.0 PPM
				23.5'-24' CLAY: very light grey (N8), sandy, stiff, dry, Friable, low plasticity (CL)	
			0934	24'-25' SAND: very light gray (N8), very fine grained, silty, soft (SM)	
3	25–35		0945 100	25'-35' SAND: very light gray (N8), medium to fine grained, subangular, silty, loose (SM)	0950 P.I.D.: 0.0 PPM
				Sand as above, but becomes clayey and firm 32'-35'	
			0957		
4	35–40		1006 100	35'-45' SAND: very light gray (N8), fine grained, subangular, silty, loose (SM)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/20/98	3 OF 6

		DRILLING SUBCONTRACTOR: Alliance Env.
WELL NO.: CH-5	LOCATION: -	DRILLER: Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
4	40				1018 P.I.D.: 0.0 PPM
	1				
	2		100		
	3			Sand as above	
	4				
	5		1019 / 1030	45'-54' SAND: pale yellowish orange (10YR 8/6) to very light gray (N8) to moderate brown (5R 4/4), medium to coarse grained, silty, loose (SM)	
5	6				
	7				
	8				
	9		100		
	50				1038 P.I.D.: 0.0 PPM
	1				
	2				
	3			Sand becomes coarse grained, dusky red (5R 3/4) and clayey 53.7'-54'	
	4			54'-55' SAND: yellowish gray (5Y 8/1), very fine grained, silty, slightly clayey, firm (SM)	
	5		1046 / 1056		
6	6			55'-62' SAND: grayish pink (5R 8/2) to dark reddish brown (10R 3/4) to moderate pink (5R 7/4), medium to coarse grained, subangular, clayey, firm (SC)	
	7		100		
	8				
	9				
	60				

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/20/98	4 OF 6
		DRILLING SUBCONTRACTOR: Alliance Environmental	
WELL NO.: CH-5	LOCATION: –	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
6	60–65		100 (1115)	62'-65' CLAY: very light gray (N8) to grayish red (5R 4/2), laminated, very sandy 62'-63.5', slightly sandy 63.5'-65', hard, dry, friable, low plasticity, especially 63.5'-65' (CL)	1107 P.I.D.: 0.0 PPM
7	65–75		(1130) 100 (1146)	65'-75' SAND: very light gray (N8) with light red (5R 6/6) to moderate red (5R 4/6) laminations, medium to coarse grained 65'-67', medium grained 67'-75', subangular, clayey, soft to firm, medium plasticity (SC)	1143 P.I.D.: 0.0 PPM
8	75–80		(1312) 100	75'-77' CLAY: very light gray (N8) to grayish orange (10YR 7/4), sandy to very sandy, hard, dense, dry, friable, low plasticity (CL) 77'-85' SAND: very light gray (N8) to grayish pink (5R 8/2) to light brown (5YR 5/6), laminated, medium grained, subangular, some small gravel to 1/4", very clayey, firm, medium plasticity (SC)	

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/20/98	5 OF 6
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-5	-	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
8	80–85		100 (1328)	Sand becomes more clayey and stiffer 83'-85'	1323 P.I.D.: 0.0PPM
9	85–95		(1338) 100 (1348)	85'-95' SAND: very light gray (N8) with occasional grayish pink (5R 8/2) to pink yellowish orange (10YR 8/6) laminations, medium grained, subangular, with 1/4" gravel scattered throughout, clayey, soft to firm, medium plasticity (SC)	1341 P.I.D.: 0.0PPM
10	95–100		(1404) 100 (1409)	95'-96' CLAY: very light gray (N8), with pale red (5R 6/2) laminations, sandy, dense, stiff, medium plasticity (CL) 96'-100' SAND: very light gray (N8) with some light red (5R 6/6) laminations, fine grained, subangular, clayey, firm, medium plasticity (SC)	1408 P.I.D.: 0.0PPM
	100		1424		

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/20/98	6 OF 6
		DRILLING SUBCONTRACTOR Alliance Env.	
WELL NO. CH-5	LOCATION	DRILLER Marty Proctor	
LOGS PREPARED BY Jim Furlow	COMPANY SAIC	DRILLING METHOD Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
11	100		1424	100'–101' CLAY: very light gray (N8), sandy, stiff, dense, low to medium plasticity (CL)	
	1				
	2			101'–107' SAND: very light gray (N8) with minor moderate pink (5R 7/4) laminations, fine to medium grained, subangular, clayey to very clayey, firm, medium plasticity (SC)	
	3		100		
	4				
	5				1428 P.I.D.: 0.0 PPM
	6		1430		
	7	Total Depth 107'			
	8				
	9				
	110				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	120				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring 320.2	3/23/98	1 OF 5
	DRILLING SUBCONTRACTOR: Alliance Environmental, Inc.	

WELL NO.	LOCATION	DRILLER
CH-6	SE area of A.I.P.	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
N/A	0				
	1			CH-6 location hand augered to 5' bls.	
	2		N/A	0'-5' SAND: dark yellowish orange (10YR 6/6) fine grained, subrounded, clayey, silty soft (SC)	
	3				
	4				
1	5		1553	5'-8.5' SAND: dark yellowish orange (10YR 6/6) to moderate brownish red (10R 4/6), fine grained, very clayey, firm to hard (SC)	
	6				
	7			8.5'-10.5' CLAY: very light gray (N8) to moderate brownish red (10R 4/6), laminated, sandy, stiff, medium plasticity (CL)	
	8				
	9		100		
	10			10.5'-13' SAND: very light gray (N8) to light brown (5YR 5/6), laminated, fine grained, very clayey, firm (SC)	1610 P.I.D.: 0.0 PPM
	1				
	2				
	3			13'-15' CLAY: very light gray (N8) with light brown (5YR 5/6) laminations, dense, hard, dry, low plasticity (CL)	
	4		1615		
2	5		1623		
	6			15'-19' SAND: pale yellowish orange (10YR 8/6) to grayish orange pink (5YR 7/2), fine to medium grained, subangular, very clayey, soft to stiff (SC)	
	7				
	8		100		
	9				
	20				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/23/98	2 OF 5
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-6	-	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
					1629
	20				P.I.D.: 0.0 PPM
2	1–4		100	19'-25' CLAY: grayish pink (5R 8/2) to pale yellowish orange (10YR 8/6), mottled 19'-22', very light gray (N8) 22'-25', hard, dense, dry, friable (CL)	
			1635		
	5		1640		
3	6–9		100	25'-35' SAND: very light gray (N8) to pale yellowish orange (10YR 8/6) to white (N9), fine to medium grained, subangular, silty, slightly clayey to clayey, soft to firm (SC)	
	30				1646
					P.I.D.: 0.0 PPM
	1–4			Sand becomes cleaner, to slightly silty, 34'-35'	
			1651	Coring ended 3/23/98	
	5		0733	Coring resumed 3/24/98	
4	6–9		100	35'-45' SAND: very pale orange (10YR 8/2) to very light gray (N8) to pale yellowish orange (10YR 8/6), medium grained, subangular, silty, slightly clayey, loose (SM)	
	40				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/24/98	3 OF 5
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-6	-	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	40				0738 P.I.D.: 0.0 PPM
	1				
4	2		100		
	3				
	4			Sand becomes coarse grained 44'-45'	
	5		0749 / 0755		
	6			45'-55' SAND: very light gray (N8) with occasional pale yellowish orange (10YR 8/6) laminations, fine to medium grained with several zones of coarse sand and 1/4"-1/2" gravel, subrounded, silty, slightly clayey, soft to loose (SM)	
	7				
	8				
5	9		100		
	50				0801 P.I.D.: 0.0 PPM
	1				
	2				
	3				
	4				
	5		0805 / 0814		
	6			55'-65' SAND: very light gray (N8) with pale red (5R 6/2) to moderate pink (5R 7/4) laminations, fine to medium grained, subangular, clayey to very clayey, dense, stiff (SC)	
	7				
6	8		100		
	9				
	60				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/24/98	5 OF 5
	DRILLING SUBCONTRACTOR Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-6	-	Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
8	80–85		100 (0924)	80'-85' SAND: very light gray (N8) with pale red (5R 6/2) laminations, fine to coarse grained, subrounded, very clayey, firm to stiff (SC)	0921 P.I.D.: 0.0 PPM
9	85–87		0936	85'-87' SAND: very light gray (N8) to grayish pink (5R 8/2) medium grained, subangular, clayey, firm (SC)	
9	87–93		100 (0950)	87'-93' CLAY: very light gray (N8) to moderate reddish brown (10R4/6) to grayish orange (10YR 7/4), laminated, silty, slightly sandy, dense, hard, dry, friable (CL)	0945 P.I.D.: 0.0 PPM
	93	T.D. of Boring: 93'			
	100				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring	DATE: 3/24/98	SHEET 4 OF 5
	DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-6	LOCATION: -	DRILLER: Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
6	60		100		0819 P.I.D.: 0.0 PPM
			0830		
7	65		0837	65'-67.5' SAND: very light gray (N8) to pale red (5R 6/2), fine grained, subrounded, very clayey, dense, firm (SC)	
			100	67.5'-69' CLAY: very light gray (N8) to pale red (5R 6/2) to moderate orange pink (10R 7/4), laminated, stiff, dense, low plasticity (CL)	
	70			69'-75' SAND: very light gray (N8) to pale red (5R 6/2) to moderate orange pink (10R 7/4), laminated, fine to medium grained, subrounded, clayey, soft to firm (SC)	0846 P.I.D.: 0.0 PPM
			0848		
8	75		0912	75'-80' SAND: very light gray (N8) coarse grained, subangular, clayey, soft, loose (SC)	
			100	sand contains 1/4" gravel throughout	
	80				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring 310.1	3/24/98	1 OF 5

WELL NO.	LOCATION	DRILLING SUBCONTRACTOR
CH-7	-	Alliance Environmental

LOGS PREPARED BY	COMPANY	DRILLER
Jim Furlow	SAIC	Marty Proctor

DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	0			Location CH-7 moved approx. 100 feet southeast of original location due to soft ground. Hand augered to depth of 5.'	
	1				
N/A	2		N/A	0'-5' SAND: moderate reddish brown (10R 4/6), fine grained, clayey, soft, loose (SC)	
	3				
	4				
	5		1512	5'-15' SAND: light brown (5YR 5/6) to very pale orange (10YR 8/2), laminated, fine grained, subrounded, very clayey, dense, stiff (SC)	
	6				
	7				
	8				
1	9		80		1517 P.I.D.: 0.0 PPM
	10				
	1				
	2				
	3				
	4			Sand becomes pale yellowish orange (10YR 8/6) 12.5'-13'	
	5		1529 / 1534	15'-25' SAND: dark yellowish orange (10YR 6/6) to moderate orange pink (5YR 8/4) to very light gray (N8), medium to coarse grained, subangular, silty, clayey 15'-20', slightly clayey 20'-25', soft to loose (SC)	
	6				
	7				
2	8		100		
	9			abundant gravel ½"-3" 19'-20'	
	20				

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring		DATE: 3/24/98	SHEET 2 OF 5
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-7	LOCATION:	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
2	20				1540 P.I.D: 0.0 PPM
	1				
	2		100		
	3				
	4		1542		
3	5		1548		
	6			25'-35' SAND: very light gray (N8) to pale yellowish orange (10YR 8/6) to grayish orange pink (5YR 7/2), coarse grained 25'-30', fine to medium grained 30'-35', subangular to subrounded, slightly clayey 25'-30', silty to clayey 30'-35', soft to loose (SC)	
	7				
	8				
	9		100		
	30				1553 P.I.D.: 0.0 PPM
	1				
	2				
	3				
	4		1556		
4	5		1605		
	6			35'-40' SAND: very light gray (N8), medium grained with some 1/4" gravel, subrounded, silty, loose	
	7				
	8		100		
	9				
	40				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/24/98	3 OF 5
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-7		Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
4	40–45		100 (1618)	40'-45' CLAY: very light gray (N8) with grayish red (5R 4/2) mottling and laminations, very sandy 40'-41', dense, hard; medium plasticity (CL)	1610 P.I.D.: 0.0 PPM
5	45–55		(1627) 100 (0810)	45'-46' SAND: pale red (5R 6/2), fine grained, clayey, stiff (SC) 46'-49.5' SILTSTONE: very light gray (N8) to grayish orange pink (5YR 7/2), clayey to slightly sandy, hard, dense, dry, friable, indurated near bottom Coring stopped at 49' 3/24/98 Coring resumed from 49' 3/25/98 49.5'-55' SAND: very light gray (N8) with pale yellowish orange (10YR 8/6) to light red (5R 6/6) laminations and mottling, fine to coarse grained 49.5-51, fine to medium grained 51'-55', subangular, clayey, soft to firm (SC)	1634 P.I.D.: 0.0 PPM
6	55–60		(0820) 100	55'-56' SAND: very light gray (N8) to grayish orange pink (10R 8/2), medium grained, subangular, clayey, soft (SC) 56'-57' CLAY: very light gray (N8) with moderate reddish orange (10R 6/6) mottling, sandy, dense, stiff (CL)	

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/25/98	4 OF 5
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-7	LOCATION: -	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
6	60		100	57'-65' SAND: very light gray (N8) with dark yellowish orange (10YR 6/6) and moderate reddish orange (10 R 6/6) laminations, fine to medium grained, subrounded, clayey, dense, stiff (SC)	0830 P.I.D.: 0.0 PPM
			0836		
7	65		0844	65'-66.5' CLAY: very light gray (N8) with moderate reddish brown (10R 4/6) mottling, very sandy, dense, stiff, low plasticity (CL)	
			100	66.5'-68' SAND: very light gray (N8) with moderate reddish orange (10R 6/6) and pale yellowish orange (10YR 8/6) laminations, medium grained, subangular, very clayey, soft (SC)	0850 P.I.D.: 0.0 PPM
	70			68'-75' CLAY: very light gray with moderate reddish orange (10 R 6/6) and pale yellowish orange (10YR 8/6) laminations, very sandy, dense, stiff, low plasticity (CL)	
			0858		
8	75		0910	75'-79' CLAY: very light gray (N8) with moderate red (5R 5/4) and dark yellowish orange (10YR 6/6) laminations/mottling, slightly sandy, dense, stiff, dry, low plasticity (CL)	
			100	79'-80' SAND: very light gray (N8), fine to medium grained, subangular, silty, slightly clayey, soft (SC)	0915 P.I.D.: 0.0 PPM
	80		0920		

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/25/98	5 OF 5
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-7		Marty Proctor
LOGS PREPARED BY	**COMPANY**	**DRILLING METHOD**
Jim Furlow	SAIC	Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
9	80		0933		
	1			80'-87' SAND: very light gray (N8) with pale red (5R 6/2) and pale yellowish orange (10YR 8/6) laminations, fine to medium grained, subangular to subrounded, silty to clayey, soft (SC)	
	2				
	3		100		0937 P.I.D.: 0.0 PPM
	4				
	5				
	6		0940		
	7	T.D. of Boring: 87'			
	8				
	9				
	90				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	100				

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/25/98	1 OF 4
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-10	LOCATION: Off road to landfill	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	0			Location CH-10 hand augered to 5 feet	
	1			0'-5' SAND: pale yellowish orange (10YR 8/6) to moderate reddish orange (10R 6/6), fine to medium grained, silty, slightly clayey, soft (SC)	
N/A	2		N/A		
	3				
	4				
	5		1311		
	6			5'-15' SAND: very light grey (N8) with moderate reddish brown (10R4/6) to pale yellowish orange (10YR 8/6) laminations, medium grained, subrounded, clayey 5'-10', silty to slightly clayey 10'-15', stiff to soft (SC)	
	7				
	8				
1	9				
	10		100		1315 P.I.D: 0.0 PPM
	1				
	2				
	3			Sand becomes clean, loose, light gray 13'-15'	
	4				
	5		1319 / 1324		
	6			15'-25' SAND: very light gray (N8), medium to coarse grained, subangular to subrounded, slightly silty to slightly clayey, soft, loose (SC)	
	7		100		
2	8				
	9				
	20				

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FIELD GEOLOGIC LOG

PROJECT	DATE	SHEET
Allied Industrial Park Coring	3/25/98	2 OF 4
	DRILLING SUBCONTRACTOR: Alliance Env.	

WELL NO.	LOCATION	DRILLER
CH-10		Marty Proctor
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	20				1327 P.I.D.: 0.0 PPM
	1				
2	2		100		
	3			Sand contains abundant gravel 1/4"-1/2" 22.5'-25'	
	4				
	5		1330 / 1335		
	6			25'-28' SAND: pale red (5R 6/2), medium grained, subangular, clayey, soft (SC)	
	7				
	8			28'-32' SILTSTONE: very light gray (N8) to pale red (5R 6/2), mottled, slightly clayey, sandy, dense, hard, friable, dry — mostly pulverized by Rotosonic drill	
3	9		100		
	30				1351 P.I.D.: 0.0PPM
	1				
	2			32'-35' SAND: very light gray (N8) to pale red (5R 6/2), laminated, medium grained, subangular, very clayey, stiff (SC)	
	3				
	4				
	5		1356 / 1423		
	6			35'-42' SAND: very light gray (N8) to moderate pink (5R 7/4), fine to medium grained, subrounded, clayey, soft to loose (SC)	
4	7				
	8		100		
	9				
	40				

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FIELD GEOLOGIC LOG

PROJECT		DATE	SHEET
Allied Industrial Park Coring		3/25/98	3 OF 4
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-10	LOCATION:	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
4	40–45		100 (1430)	Sand becomes very clayey 40'-42' 42'-44' CLAY: very light gray (N8) with minor pale red (5R 6/2) laminations at 44', slightly sandy, dense, hard, dry, friable (CL) 44'-45' SAND: very light gray (N8), fine grained, subangular, clayey, firm (SC)	1427 P.I.D.: 0.0 PPM
5	45–55		(1438) 100 (1450)	45'-52' SAND: very light gray (N8), medium grained, subangular, very clayey, firm (SC) 52'-53' CLAY: very light gray (N8), sandy to slightly sandy, hard, dense, dry, low plasticity (CL) 53'-55' SAND: very light grey (N8), medium grained, subangular, clayey to very clayey, firm (SC)	1444 P.I.D.: 0.0 PPM
6	55–60		(1455) 100	55'-56' SAND: grayish pink (5R 8/2), medium grained, subangular, clayey, firm (SC) 56'-61' CLAY: very light gray (N8), slightly sandy, dense, hard, low plasticity (CL)	

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FIELD GEOLOGIC LOG

PROJECT: Allied Industrial Park Coring		DATE: 3/25/98	SHEET 4 OF 4
		DRILLING SUBCONTRACTOR: Alliance Env.	
WELL NO.: CH-10	LOCATION:	DRILLER: Marty Proctor	
LOGS PREPARED BY: Jim Furlow	COMPANY: SAIC	DRILLING METHOD: Rotosonic	

RUN NUMBER	DEPTH BELOW GROUND SURFACE, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS/REMARKS
	60				1506 P.I.D.: 0.0 PPM
6	1			61'-63' SAND: very light gray (N8) with grayish pink (5R 8/2) laminations, medium grained, subangular, very clayey, stiff (SC)	
	2		100		
	3			63'-65' CLAY: very light gray (N8) with pale red (5R 6/2) mottling/laminations, slightly sandy 63'-64', dense, hard, low plasticity (CL)	
	4		1511		
	5	T.D. of Boring: 65'			
	6				
	7				
	8				
	9				
	70				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	80				